

Spring 5-2015

Hypocrisy Induction to Increase College Students' Condom Use: A Dissonance-Based Safe Sex Intervention

Stephanie B. Benson

Bates College, sbenson@bates.edu

Follow this and additional works at: <http://scarab.bates.edu/honorsthesis>

Recommended Citation

Benson, Stephanie B., "Hypocrisy Induction to Increase College Students' Condom Use: A Dissonance-Based Safe Sex Intervention" (2015). *Honors Theses*. 127.

<http://scarab.bates.edu/honorsthesis/127>

This Open Access is brought to you for free and open access by the Capstone Projects at SCARAB. It has been accepted for inclusion in Honors Theses by an authorized administrator of SCARAB. For more information, please contact cbell@bates.edu.

Hypocrisy Induction to Increase College Students' Condom Use: A
Dissonance-Based Safe Sex Intervention

An Honors Thesis

Presented to
The Faculty of the Department of Psychology
Bates College

in partial fulfillment of the requirements for the
Degree of Bachelor of Arts

by
Stephanie Benson
Lewiston, Maine
March 30th, 2015

Acknowledgements

I would like to thank my advisor, Professor Su Langdon, for her unwavering support, dedication, and guidance throughout the entire process. I am incredibly grateful that I had the opportunity to work with Su; she has inspired me to pursue psychology and fostered my interest in Health Psychology. I would also like to thank my friends for their ceaseless encouragement, feedback, and willingness to participate in research. I'd especially like to thank Alex Daugherty for being the test subject and research assistant. Lastly, I would like to express my deepest gratitude to my parents, Scott and Lori, for their unconditional love and support; I could not have completed this work without their guidance, insight, and encouragement.

Table of Contents

Abstract	4
Introduction	5
Factors that Affect Condom Use.....	6
Cognitive Dissonance Theory.....	8
Online Safe Sex Interventions	11
The Current Study.....	13
Study 1	14
Method	14
Results.....	19
Discussion.....	23
Study 2	26
Method	26
Results.....	28
Discussion.....	32
General Discussion	33
References	38
Appendix	41
Tables	58
Figures	62

Abstract

Despite the effectiveness of condoms in preventing sexually transmitted infections (STIs) and unwanted pregnancies, only 49% of college students consistently use condoms during sexual intercourse. The current research utilized hypocrisy induction, a dissonance-based intervention, to increase condom use among undergraduate students. This research consisted of two studies: the first was administered in-person, and the second was conducted via the Internet. Studies 1 and 2 measured the immediate and long-term effects of hypocrisy induction on college students' use of and motivation to use condoms. For both studies, it was hypothesized that hypocrisy participants would demonstrate greater intent for and frequency of safe sex at the one-month follow-up. In both experiments, hypocrisy participants' long-term motivation to practice safe sex was significantly higher than control participants'. However, hypocrisy participants' condom use did not increase in Studies 1 or 2. Implications and limitations of the experiments and results are discussed.

Hypocrisy Induction to Increase College Students' Condom Use: A Dissonance-Based Safe Sex Intervention

According to the Centers for Disease Control and Prevention (CDC, 2013), young adults account for approximately fifty-percent of new STI incidences in the United States each year. Left untreated, STIs like HIV/AIDS, human papillomavirus (HPV), hepatitis B, and trichomoniasis, put young people at increased risk for infertility and death (CDC, 2013). To prevent STI contraction and unwanted pregnancies, sexually active individuals can use various barriers and strategies, like condoms and hormonal contraception.

Despite the benefits and effectiveness of contraceptives, many individuals do not practice safe sex (Murray & Miller, 2000). For example, a recent study revealed only 49% of sexually active college students consistently use condoms during sexual intercourse (McKay & Bissell, 2010). Due to high prevalence of STIs and low frequency of condom use among young adults, many safe sex interventions have targeted college students.

Social scientists have implemented various types of interventions to increase undergraduates' condom use. Education-based safe sex interventions have been moderately successful. For example, an informational session about STIs and safe sex significantly increased female undergraduates' condom use (Bryan, Aiken & West, 1996). Other educational interventions, however, have been less effective. Specifically, Dermen & Thomas' (2011) education-based intervention, which simultaneously addressed undergraduates' condom use and binge drinking, did not produce any long-term behavior changes. Researchers propose that educational safe sex interventions may be inappropriate for college students (LaBrie, Pedersen, Thompson & Earleywine, 2006). According to LaBrie et al. (2006), education-based interventions are efficacious when

participants, prior to an intervention, are motivated and willing to change their behaviors. If participants are unmotivated or resistant to adapting their actions, then motivation-based interventions are more likely to stimulate behavior change than educational interventions (LaBrie et al., 2006). Because many college students are unwilling and unmotivated to use condoms, researchers suggest that motivation-based safe sex interventions might be more efficacious for this age group (LaBrie et al., 2006).

Motivation-based interventions are predicated on the belief that motivation to practice a target behavior is a prerequisite for engaging in that behavior (Fullerton, Meany, Rye & Loomis, 2013). Various types of interventions, like information-motivation-behavioral (IMB) skills and dissonance-based interventions, rely on the relationship between motivation and action. The goal of motivation-based interventions is to increase participants' motivation to engage in a target behavior in order to stimulate subsequent behavior change. Researchers have successfully applied both information-motivation-behavioral skills and dissonance-based interventions to increase consumption and use of condoms among college students (Stone, Aronson, Crain, Winslow & Fried, 1994). Despite their efficacy, only a few dissonance-based interventions have been implemented to promote safe sex. Further, dissonance-based safe sex interventions have never been conducted via the Internet, despite the efficacy of other online safe sex interventions. Thus, the current research will use hypocrisy induction, a dissonance-based intervention, to promote safe sex utilizing two methods: an in-person and online intervention.

Factors that Affect Condom Use

Various factors contribute to undergraduates' condom nonuse. Understanding the characteristics and circumstances that affect condom use enables researchers to develop more specific, relevant, and efficacious interventions. Previous research indicates that hormonal contraceptive use, relationship status, gender, and age are correlated with condom use (Civic, 2000; Lewis, Granato, Blayney, Lostutter, & Kilmer, 2012). If, for example, researchers know that older students use condoms less frequently than younger students, they know that their safe sex intervention should target upperclassmen.

Among the various factors that influence condom use, hormonal contraception seems to be the strongest predictor of safe sex. Specifically, hormonal contraception acts as a mediator for the relationship between condom use, relationship status, and age. For example, females taking hormonal contraception are less likely to use condoms than males (Lewis et al., 2011; Walsh et al., 2013). Also, because, older collegiate females are more likely to use hormonal contraception, they are less likely to use condoms than their younger counterparts (Walsh et al., 2013). The fact that condom use and hormonal contraception are inversely related among college students suggests that undergraduates emphasize pregnancy prevention more than STI protection. The interaction between hormonal contraception and condom use for college students helps to explain why STI prevalence is so high for this age group.

Hormonal contraception use also affects the interaction between condom use and relationship status. Overall, students in committed relationships are less likely to use condoms than students hooking up (Patrick, 2013). Research indicates that birth control increases with the progression of romantic relationships and condom use decreases (Civic, 2000). Students in monogamous relationships explain they don't use condoms

because they know their partners' sexual histories and feel confident that the risk of contracting STIs is low (Civic, 2000).

Still, students engaged in hook-ups demonstrate low rates of condom use. Hook-ups are defined as the sexual encounter between two people who are neither dating nor engaged in a committed relationship. Previous research indicates that only 46.6% of college students used a condom during their most recent hook-up (Lewis et al., 2011). For students hooking up, it seems that *whom* students hook-up with influences condom use more than hormonal contraception. Specifically, college students are more likely to use condoms if they hook-up with friends or ex-partners, and less likely to use condoms if they don't know their partners well (Lewis et al., 2011). Not only does this trend account for the high prevalence of STIs among undergraduates, but it also underscores the importance of implementing safe sex interventions for college students engaged in hook-ups. Additional factors, like individuals' attitudes and motivation, affect whether or not college students use condoms during sexual intercourse.

Cognitive Dissonance Theory

Leon Festinger's cognitive dissonance theory emphasizes the relationship between one's cognitions, motivations, and actions. Cognitive dissonance is the psychological discomfort that occurs when an individual's attitudes, beliefs, and behaviors are discordant (Brehm, 2007). The cognitive dissonance theory explains that such distress motivates individuals to adapt either their attitudes or behaviors in order to restore consonance. Many researchers have used the cognitive dissonance theory to understand and promote behavior change (Stone & Fernandez, 2008).

Cognitive dissonance-based interventions include the belief disconfirmation paradigm, free choice paradigm, effort justification paradigm, induced compliance paradigm and hypocrisy paradigm (Freijy & Kothe, 2013). All dissonance-based interventions aim to create a discrepancy between an individual's beliefs and behaviors in order to stimulate positive behavior change (Stone & Fernandez, 2008). Among the five dissonance-based paradigms, researchers have found that hypocrisy induction is most strongly associated with behavior change (Stone & Fernandez, 2008). To induce hypocrisy, researchers have participants complete two tasks: reflection on target behavior and public advocacy. First, participants are asked to consider recent instances in which they failed to practice a target behavior. Then, participants must publicly advocate for the target behavior in an essay or speech (Stone & Fernandez, 2008). These tasks make participants aware of and uncomfortable with inconsistencies in their cognitions and actions. Consequently, participants will adapt their attitudes and behaviors to reduce dissonance and discomfort (Stone & Fernandez, 2008). Researchers have successfully induced hypocrisy to change behaviors like maladaptive eating habits, cigarette smoking, and unsafe sex (Hafstad et al., 1997). Overall, these interventions have demonstrated long-term positive behavior changes.

Dissonance-Based Safe Sex Interventions

Because they represent an at-risk population for contracting STIs, college students have been the primary recipients for dissonance-based safe sex interventions. To date, two studies have successfully induced hypocrisy to increase condom use among young adults. In the original study, Aronson et al. (1991) manipulated mindfulness and public advocacy to promote safe sex. Half the participants (high mindful) were asked to reflect

on and describe situations of non-condom use, while the other half (low mindful) answered questions that were unrelated to condom use. Then, half the high mindful and half the low mindful participants advocated for condom use in a speech that was video-recorded. The remaining participants wrote a speech without reading it aloud. After completion, all participants answered questions about the frequency of previous condom use and their intention to use condoms in the future. Three months later, participants completed a follow-up survey about their recent use of and motivation to use condoms. While there were no immediate differences in future intention to use condoms between the four conditions, Aronson et al.'s (1991) research did produce long-term changes. At the three-month follow-up, participants in the hypocrisy condition (high-mindful and public advocacy) indicated using condoms 63.9% of the time. In comparison, participants in the salience condition (high-mindful and no public advocacy) used condoms only 22.25% of the time. Three years later, a similar study was administered using additional dependent variables.

In their research, Stone, Aronson, Crain, Winslow & Fried (1994) also manipulated mindfulness and public advocacy to improve undergraduates' condom use. Like Aronson et al. (1991), Stone et al. (1994) looked at the immediate and long-term effects of hypocrisy induction on participants' motivation and frequency of condom use. Additionally, condoms were available for participants to purchase at the laboratory in order to measure the immediate effects of hypocrisy induction on safe sex behaviors. Ninety days after the experiment, a follow-up telephone interview was administered to assess participants' recent condom use and future intentions to practice safe sex. This study produced both initial and long-term behavioral and attitudinal changes.

Immediately after participation, hypocrisy participants (high mindful and public advocacy condition) bought condoms more frequently and intended to use condoms significantly more than control participants. At the follow-up, hypocrisy participants reported using condoms 92% of the time compared to public advocacy-only participants who indicated using condoms 55% of the time. In addition to attitudinal and behavioral measures of dissonance, researchers can examine participants' psychological and physiological responses.

Measures of Dissonance

Because the goal of hypocrisy induction is to create dissonance and discomfort, researchers can look at participants' psychological distress and physiological arousal as measures of dissonance. The presence of psychological distress and physiological arousal demonstrates that participants experienced dissonance (Ward & Carlson, 1964). Thus, researchers might ask participants to indicate how they are feeling emotionally after dissonance is induced. Further, discomfort and anxiety, products of dissonance, are associated with increased heart rate and perspiration (Ward & Carlson, 1964). Thus, some dissonance-based studies have used participants' heart rates and psycho galvanic skin response as dependent variables (Ward & Carlson, 1964). Together, psychological and physiological variables enable researchers to determine if and how much participants experienced dissonance.

Online Safe Sex Interventions

Because of society's reliance on technology, online studies have become a popular medium for administering research and collecting data. Online surveys and interventions have many benefits; they are less expensive, more efficient and can reach

larger, more diverse samples than in-person experiments. To date, only two online interventions have been administered to increase condom use. Both studies were based on the IMB model and sought to enhance participants' motivation to engage in safer sex (Mevisen, Ruiters, Meertens, Zimblin & Schaalma, 2011). The first study targeted heterosexual college students. The intervention technique was derived from motivational interviewing and provided participants with information about STIs as well as computer-generated feedback (Mevisen et al., 2011). Results indicated that participants' motivation to use and actual use of condoms significantly increased immediately after participation and at the 3-month follow-up. The second online intervention targeted men who have sex with men (MSM) (Bowen, Williams, Daniel, & Clayton, 2008). The intervention used an online questionnaire to increase participants' knowledge about and motivation to engage in safer sex (Bowen et al., 2008). Participants' use of condoms significantly increased at the 3-month follow-up. Together, these studies demonstrate that increasing participants' motivation to use condoms via online techniques can effectively and efficiently promote condom use with lasting effects.

Despite the benefits of conducting online research, a limited number of researchers have administered Internet-based safe sex interventions. Online studies allow individuals to choose when and where they participate in research. This might be particularly advantageous for safe sex interventions as it gives participants more privacy to answer sensitive and personal questions. To date, no researchers have induced hypocrisy via the Internet to increase safe sex. Based on the efficacy of online safe sex interventions and hypocrisy induction independently, it seemed logical to examine the effects of an online dissonance-based safe sex intervention.

The Current Study

The present research utilized hypocrisy induction to increase individuals' motivation to use and actual use of condoms in two studies. The first study occurred in a psychology laboratory, while the second study was administered via the Internet. Both studies had follow-up surveys to measure the long-term effects of hypocrisy induction on participants' attitudes towards and use of condoms.

To date, no safe sex intervention has simultaneously measured participants' physiological arousal, psychological distress, and behavioral and attitudinal responses to dissonance. Therefore, the first goal of the present research was to measure individuals' reactions to dissonance more holistically in Study 1. Whereas physiological response and emotional distress are ways to measure the presence of dissonance, attitudinal and behavioral changes are methods for determining the effects of dissonance. Based on previous research, it was hypothesized that hypocrisy participants would experience more emotional distress, higher heart rates, more motivation to use condoms, and take more condoms (available at conclusion of study) than control participants. At the one-month follow-up, it was predicted that participants in the hypocrisy condition would have used condoms more frequently and demonstrate greater motivation to practice safe sex than participants in the control condition.

Additionally, researchers have not induced hypocrisy via the Internet. Therefore, the second goal of the present research was to determine the effectiveness of an online hypocrisy intervention in Study 2. Independently, hypocrisy induction and online interventions have been successful in promoting condom use. Thus, it seemed logical to apply and evaluate the efficacy of an online hypocrisy intervention. Based on previous

research, it was hypothesized that inducing hypocrisy via the Internet would significantly increase hypocrisy participants' intention to use and actual use of condoms both immediately and at the one-month follow-up.

To date, there is no research that examines the way in which factors associated with low condom use affect the efficacy of safe sex interventions. Therefore, the final goal of the present research was to compare the immediate and long-term effects of hypocrisy induction between males and females, students in relationships and students hooking up, and females taking hormonal contraceptives and females not taking hormonal contraceptives. For example, previous research indicates that students in relationships use condoms less frequently than those engaged in hook-ups. Given this association, the present research sought to determine whether the effects of hypocrisy induction on safe sex would differ between students in committed relationships versus students hooking up (Civic, 2000). For both Study 1 and Study 2, it was hypothesized that intent to use and actual use of condoms would differ for males and females, students in monogamous relationships and students hooking up, and females taking hormonal contraceptives and females not taking hormonal contraceptives.

Study 1

Method

Participants. Participants were undergraduate men and women ($N = 68$; 56% female) from Bates College. Eighty-three percent of participants were first-year students and 78% of participants had previously had sexual intercourse. Fifty-one percent of students used hormonal contraception or had a sexual partner(s) who used hormonal

contraception. Participants were recruited through announce emails and sign-up sheets in psychology classes.

Materials. Qualtrics Survey Software was used to administer questionnaires in this study. Materials included the Sexual Experience Questionnaire, Safe Sex Questionnaire, Sexual Behaviors and Attitudes Questionnaire, and Sexual Behaviors and Attitudes Follow-Up Questionnaire. All of the questionnaires were created for the purpose of this study and were adapted from Aronson et al. (1991), Stone et al. (1994), and Langdon's (2014) research. A video camera was used to record participants during the public advocacy portion. Additionally, all participants wore heart rate monitors to measure physiological arousal. Condoms (12 in bowl) and brown bags were available at the conclusion of Study 1 to measure the immediate effects of hypocrisy on safe sex behaviors

Sexual Experience Questionnaire (Baseline Survey). The Sexual Experience Questionnaire was a 7-item survey that inquired about demographic information and individuals' sexual history. Sample questions from this survey included: "Have you had sexual intercourse before?" and "Please indicate the number of sexual partners you have had in the past month". Some responses were "yes/no" while others were open-ended (See Appendix A). Because this survey was created for the purpose of the present study, there are no measures of validity.

Safe Sex Questionnaire (Baseline Survey). The Safe Sex Questionnaire was a 9-item survey that assessed demographic variables and individuals' past use of condoms. This survey asked participants to reflect on instances of condom nonuse in order to induce hypocrisy. Sample items from this survey included: "Please indicate the last time

you did not use a condom during sexual intercourse” and “Please write a brief sentence about the most recent incident in which you did not use a condom during sexual intercourse”. Some responses were open-ended and others were multiple-choice (See Appendix B).

Sexual Behaviors and Attitudes Questionnaire (Post-Survey). The Sexual Behaviors and Attitudes Questionnaire was an 11-item survey that inquired about individuals’ relationship status, sexual experiences, and emotional arousal. The survey was divided into two subscales. The first subscale measured individuals’ use of and attitudes towards condoms. For example, participants were asked to approximate how frequently they use condoms during sex on a scale from 1 = *never had sex*, 2 = *never use condoms during sex* 3 = *twenty-five-percent of the time*, 4 = *fifty-percent of the time*, 5 = *seventy-five-percent of the time*, to 6 = *one-hundred-percent of the time*, with lower numbers indicating less frequent condom use. To measure attitudes towards safe sex, participants were asked to indicate the importance of consistent condom use on a scale from 1(*not at all important*) to 5(*very important*) and their future motivation to use condoms on a scale from 1(*not at all motivated*) to 5(*very motivated*). The second subscale measured participants’ emotions. Specifically, participants were asked, “After answering these questions, I feel...” and responses were scored on a 5-point Likert scale. Sample mood states included uncomfortable and comfortable, anxious and calm, guilty and innocent, and ashamed and proud, with lower numbers indicating more negative emotions (See Appendix C). The reliability for this subscale was good at $\alpha = .85$.

Sexual Behaviors and Attitudes Follow-Up Questionnaire. The Sexual Behaviors and Attitudes Follow-Up Questionnaire, an 11-item survey, was utilized to

determine if hypocrisy induction produced long-term behavioral and attitudinal changes. The measures were modified from the Sexual Behaviors and Attitudes Questionnaire (post-survey) to reflect participants' safe sex behaviors and attitudes in the past month. (See Appendix D).

Heart rate monitors. A Garmin Forerunner 410 was used in the present study to measure physiological arousal. Participants wore a chest strap and watch during participation. The heart rate (HR) monitor recorded participants' HR continuously and data was transferred to a computer via USB stick. To calculate HR data, the experiment was divided into four sections: baseline, baseline survey, public advocacy, and post-survey. Participants' heart rates at the end of baseline survey, public advocacy, and post-survey were determined and averaged. For example, hypocrisy participants' mean heart rate at the end of baseline survey was compared to control participants' mean heart rate at the end of baseline survey.

Speech content. A research assistant was recruited to analyze the 30-second video-recorded speeches. The research assistant was blind to condition and instructed to evaluate both the delivery and quality of participants' speeches. For example, the research assistant was asked "How would you describe the participant?" and responses were scored on a 5-point Likert scale. Sample anchors included anxious and calm, ashamed and proud, and uncomfortable and comfortable, with lower numbers indicating more negative emotions. Then, the research assistant was asked to describe the quality of participants' speeches on a 5-point Likert scale. Sample anchors include inaccurate and accurate, not at all informative and very informative, and not at all persuasive and completely persuasive (See Appendix E).

Procedure

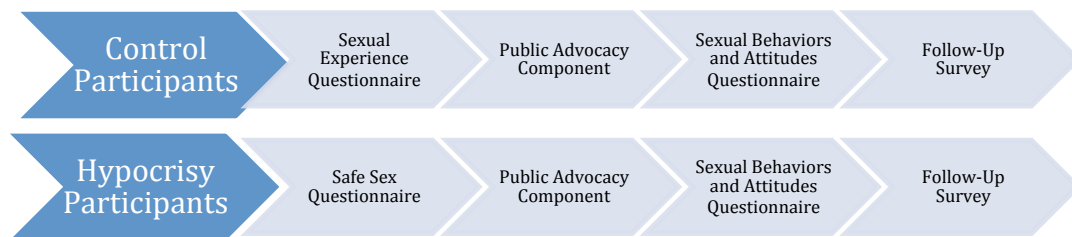
Part 1. IRB approval was obtained from the institution. Information about the current study and instructions for participation were distributed through announce emails and sign-up sheets in psychology classes. Upon arrival, participants provided written informed consent. An online randomizer assigned participants to the experimental condition or control condition. Each participant was then directed behind a screen divider to put on the HR monitor. Once the heart rate monitor was set up, participants began answering the Sexual Experience Questionnaire (control condition) or the Safe Sex Questionnaire (experimental condition).

Upon completing baseline survey questionnaires, all participants publicly advocated for condom use. During this portion of the study, participants wrote and read aloud a brief speech about condom use. First, participants provided written consent for video recording; they were told that their speeches would be used to develop an informational safe sex video for high school students. Then, they were given approximately 7-minutes to write a 3-5-sentence speech about the importance of condom use. Once completed, video recording began.

Participants were then directed to the computer to respond to the Sexual Behaviors and Attitudes Questionnaire. Both hypocrisy and control participants completed this survey. After responding to the Sexual Behaviors and Attitudes Questionnaire, participants were directed to the screen divider and instructed to remove the HR monitor. Condoms and brown bags were available behind the screen divider and participants were told to help themselves to condoms. Lastly, participants were debriefed. If applicable, students received research credit towards their psychology class

for participating. Participants were reminded that the current research consisted of two parts and they would receive a follow-up survey in one month via email.

Follow-up. Four weeks after the lab portion, participants were sent an email containing a link to the Sexual Behaviors and Attitudes Follow-Up Questionnaire. After completing the follow-up survey, participants' names were entered into a raffle for five \$10 gift certificates. See below for order of events.



Results

Preliminary Analyses

All participants who previously had sexual intercourse were included in the present data analyses ($n=53$). Preliminary two-sample independent t -tests and Chi-squares were conducted to determine if there were any significant differences between hypocrisy and control participants at baseline survey. No significant differences were found in terms of class year, $\chi^2(3) = 3.72, p = .29$ or gender, $\chi^2(1) = 0.67, p = .49$. There were also no significant differences between hypocrisy and control participants in terms of baseline heart rate $t(37) = 0.38, p = .71$, relationship status, $\chi^2(2) = 0.78, p = .68$, or hormonal contraception use, $\chi^2(2) = 3.40, p = .18$. The frequencies for both conditions at baseline survey can be found in Table 1.

Post-Survey Analyses

Hypothesis testing. Two-sample independent *t*-tests were conducted to determine if there were any significant differences between hypocrisy and control participants' attitudes, behaviors, psychological distress, and physiological arousal at post-survey. Results indicated no significant difference in importance of condom use between hypocrisy and control participants, $t(49) = 0.66, p > .05$. Additionally, a two-sample *t*-test for independent groups revealed no significant difference between hypocrisy and control participants for number of condoms taken, $t(50) = 0.85, p > .05$. However, there was a trend towards significance in which hypocrisy participants ($M = 4.28, SD = 1.06$) were less motivated than control participants at post-survey ($M = 4.69, SD = 0.62$), $t(38.28^1) = 1.70, p = .10$, Cohen's $d = 0.47$.

In terms of psychological distress, there were no significant differences between hypocrisy and control participants' comfort level, $t(49) = 0.72, p > .05$, guiltiness, $t(49) = 0.21, p > .05$, or shame, $t(49) = 0.09, p > .05$. However, there was a trend toward significance in which hypocrisy participants ($M = 3.44, SD = 1.33$) felt more anxious than control participants ($M = 3.96, SD = 0.99$), $t(44.61) = 1.59, p = .12$, Cohen's $d = 0.44$.

Two-sample independent *t*-tests were conducted to determine if hypocrisy and control participants' absolute heart rates differed at baseline survey, public advocacy, and post-survey. Due to equipment malfunction, heart rate data was not obtained for all participants ($n = 39$ for HR data). At the end of baseline survey, hypocrisy participants' ($M = 83.32, SD = 14.04$) mean absolute heart rate was significantly higher than control participants' ($M = 72.35, SD = 9.58$), $t(37) = 2.86, p < .01$, Cohen's $d = 0.91$. Also,

¹Levene's Test indicated that equal variances were not assumed (applies for all degrees of freedom that contain decimals)

² Includes females taking hormonal contraception and males whose partner(s) takes hormonal

hypocrisy participants' ($M = 111.68$, $SD = 15.33$) mean absolute heart rate was significantly higher than control participants' ($M = 103.45$, $SD = 9.97$) after public advocacy, $t(30.68) = 1.98$, $p = .05$, Cohen's $d = 0.64$. Results indicated no significant difference in mean absolute heart rate between hypocrisy and control participants at post-survey, $t(37) = 0.16$, $p > .05$.

Demographic differences. To determine whether gender influenced dissonance arousal, additional two-sample independent t -tests were conducted. Results indicated that males ($M = 3.60$, $SD = 1.00$) were marginally less ashamed than females ($M = 3.15$, $SD = .78$), $t(45.51) = 1.77$, $p = .08$, Cohen's $d = 0.50$. Additionally, there was a trend towards significance in which males ($M = 3.96$, $SD = 1.06$) felt more comfortable than females ($M = 3.42$, $SD = 1.33$), $t(47.37) = 1.59$, $p = .12$, Cohen's $d = 0.45$.

One-way ANOVAs were conducted to assess whether use of hormonal contraception affected dissonance arousal. At baseline survey, absolute heart rate was significantly higher for males who didn't know if their partner(s) took hormonal contraception ($M = 94.17$, $SD = 13.39$) compared to participants who took hormonal contraception² ($M = 73.87$, $SD = 10.17$), $F(2,26) = 9.39$, $p = .001$, and participants who did not take hormonal contraception³ ($M = 70.88$, $SD = 10.15$), $F(2,26) = 7.28$, $p = .003$.

One-way ANOVAs also revealed significant differences in emotional distress among individuals in monogamous relationships, individuals hooking up, and individuals abstaining from dating and hooking up. At post-survey, participants in relationships ($M = 4.99$, $SD = 0.27$) felt significantly more comfortable than participants hooking up ($M =$

² Includes females taking hormonal contraception and males whose partner(s) takes hormonal contraception for all measures of hormonal contraception

³ Includes females not taking hormonal contraception and males whose partner(s) does not take hormonal contraception for all measures of hormonal contraception

4.75, $SD = 0.25$), $F(2,48) = 3.31$, $p = .05$, Cohen's $d = 0.92$. Additionally, there was a trend toward significance in which participants in monogamous relationships ($M = 3.71$, $SD = 1.14$) felt less ashamed than participants hooking up ($M = 3.08$, $SD = .70$), $F(2,48) = 2.75$, $p = .07$, Cohen's $d = 0.67$. There were no significant differences in emotional distress between individuals who hook-up and individuals who abstain from dating and hooking-up.

Follow-Up Analyses

Attrition analyses. Of the 53 participants who previously had sex, a total of 32 (60%) participants completed the follow-up survey. Preliminary two-sample independent t -tests were conducted to determine if there were differences between participants who did and did not complete the follow-up survey. Participants who dropped out at the follow-up survey ($M = 4.89$, $SD = .32$) valued condoms significantly more at post-survey than participants who completed the follow-up ($M = 4.31$, $SD = 1.12$), $t(48.64) = 2.73$, $p = .009$, Cohen's $d = 0.70$. Results also indicated that participants who dropped out at the follow-up survey ($M = 4.79$, $SD = 0.54$) were more motivated to use condoms at post-survey than participants who completed the follow-up ($M = 4.31$, $SD = 0.99$), $t(48.65) = 2.22$, $p = .03$, Cohen's $d = 0.60$.

Hypothesis Testing. Two-sample independent t -tests were conducted to assess the differences between hypocrisy and control participants' safe sex attitudes and behaviors at the one-month follow-up. A two-sample independent t -test revealed that hypocrisy participants ($M = 3.54$, $SD = 1.65$) were marginally more motivated to use condoms than control participants ($M = 2.67$, $SD = 1.61$) at the one-month follow-up, $t(28) = 1.69$, $p = .10$, Cohen's $d = .053$.

One-way ANOVAs with repeated measures were conducted to determine the effects of the intervention on safe sex attitudes and behaviors from post-survey to the one-month follow-up. There was a significant interaction between time and condition on motivation to use condoms in the past month, $F(1,36) = 4.19, p = .05$. Hypocrisy participants were less motivated at post-survey than control participants, but more motivated during the past month than control participants, as shown in Figure 1.

Demographic differences. Additional one-way ANOVAs with repeated measures were conducted to determine if long-term attitudes and behaviors differed for males versus females, individuals in relationships versus individuals hooking up, and participants taking hormonal contraception versus those not taking hormonal contraception. Results indicated a significant interaction between gender and time on frequency of condom use, $F(1,5) = 8.43, p = .034$. Specifically, males used condoms less frequently than females at post-survey, but males used condoms more frequently than females at the one-month follow-up, as displayed in Figure 2. There were no significant interactions between time and relationship status or time and hormonal contraception use on long-term safe sex behaviors and attitudes.

Content Analysis

Two-sample independent t -tests were computed to determine if condition affected the quality and delivery of participants' speeches during public advocacy. Results indicated no significant differences between control and hypocrisy participants' anxiety, pride, or comfort level. Additionally, there were no significant differences in quality, informativeness, accuracy, detail, or persuasiveness between hypocrisy and control participants' speeches. The means and standard deviations for both conditions during

public advocacy can be found in Table 2. See below for an example of a public advocacy speech.

Safe sex is using a combination of birth controls discussed between both parties. As a bare necessity, condoms should always be used to prevent the spread of STDS as well as prevent unwanted pregnancies. Both persons involved should be completely aware of the risks of both safe and unsafe sex and understand the consequences should they chose to ignore precautions or their contraception should fail.

Discussion

The current study induced hypocrisy to increase undergraduates' intent to use and actual use of condoms. Some results from Study 1 were anticipated, while other findings were unexpected. As predicted, mean absolute heart rate at the end of baseline survey and public advocacy was higher for hypocrisy participants than for control participants. Also, emotional distress was slightly higher for hypocrisy participants than control participants at post-survey. These results verify that hypocrisy was induced and dissonance was stimulated for hypocrisy participants. However, the fact that both hypocrisy and control participants' heart rates increased during the study indicates that all participants experienced some degree of dissonance. This finding might help to explain why there was no difference between control and hypocrisy participants' immediate consumption of condoms. Although unanticipated, these results were consistent with Aronson et al.'s (1991) finding that hypocrisy induction produces long-term, but not immediate changes.

Additionally, results indicated that certain demographic variables were associated with increased dissonance arousal. Specifically, dissonance was greatest among individuals who are less likely to practice safe sex and more likely to contract STIs. For example, females' indicated more emotional distress than males. Also, individuals

engaged in hook-ups experienced more dissonance than participants in monogamous relationships. If discomfort was greatest for individuals at increased risk for STIs, and dissonance is a precursor for behavior change, then these findings suggest that hypocrisy induction might be capable of reducing the transmission of STIs.

The follow-up analyses indicated that hypocrisy induction significantly influenced participants' long-term attitudes and behaviors. Attrition analyses revealed unexpected, yet important results. The fact that participants who were less motivated at post-survey were more likely to complete the follow-up study indicates that the current research had positive effects on participants' long-term motivation. As predicted, hypocrisy participants were more motivated to use condoms than control participants at the one-month follow-up. Surprisingly, however, hypocrisy and control participants' motivation for safe sex decreased over time. Additionally, actual condom use did not differ between the experimental and control groups. Though this finding is inconsistent with the hypothesis and previous research, it is not wholly unexpected. In Aronson et al. (1991) and Stone et al.'s (1994) research, the follow-up studies occurred three months after initial participation. The longer time period in Aronson et al.'s (1991) and Stone et al.'s (1994) research likely allowed for more behavioral changes to occur.

Additional analyses indicated that specific demographic variables were associated with more favorable outcomes. Specifically, males' condom use was lower than females' at post-survey, but higher at the one-month follow-up study. Previous literature on hypocrisy induction suggests that more dissonance is associated with better behavioral outcomes. Thus, it was surprising that males demonstrated long-term positive behavioral changes given that they experienced less dissonance at post-survey. Combined with the

condition by time interaction, these results revealed an important trend for in-person hypocrisy interventions. Perhaps there is a threshold for attitudinal and behavioral changes; maybe too much dissonance at post-survey inhibits rather than promotes safe sex attitudes and practices. This hypothesis would help to explain why males' condom use increased over time. Similarly, this trend helps account for the fact that hypocrisy participants, who experienced significant dissonance at post-survey, demonstrated decreased motivation for safe sex over time. Such findings have important implications for future hypocrisy interventions.

The results from Study 1 verified that hypocrisy induction is capable of stimulating long-term positive attitudinal and behavioral changes among certain individuals. Additionally, Study 1 revealed that too much dissonance might be harmful rather than beneficial for individuals' safe sex practices. Based on these results, it seemed logical to explore an online hypocrisy intervention as Internet-based research provides more privacy and comfort for participants. It was hypothesized that an online hypocrisy induction would arouse less dissonance than an in-person intervention, which, based on Study 1 results, would lead to more positive outcomes. Also, because online research is cost-effective and accessible to larger samples, it seemed appropriate to examine the efficacy of an Internet-based hypocrisy intervention.

Study 2

Method

Participants. Participants included 91 (73% female) undergraduate men and women from Bates College. About one-third of participants were first-year students. Approximately 76% of participants had previously had sexual intercourse and 59% of

participants used hormonal contraception. Participants were recruited via announcement emails. Participants who completed Study 1 were excluded from participating in Study 2 (See Appendix G for order of events).

Materials. Qualtrics Survey Software was used to administer online questionnaires and randomly assign participants to the control or experimental condition. There were three distinct surveys in the current study: the Sexual Experiences and Attitudes Questionnaire, the Safe Sex Experiences and Attitudes Questionnaire, and the Sexual Behaviors and Attitudes Follow-Up Questionnaire. All of the surveys were created for the purpose of this study and were adapted from Stone et al. (1994), Aronson et al. (1991), and Langdon's (2014) research.

Sexual Experiences and Attitudes Questionnaire. The Sexual Experiences and Attitudes Questionnaire consisted of 20 questions. The first seven questions (baseline survey) came from the Sexual Behaviors Questionnaire and the last eleven questions (post-survey) were from the Sexual Behaviors and Attitudes Questionnaire from Study 1. For measures of psychological distress and safe sex attitudes, lower numbers indicate negative emotions and attitudes. In addition, the Sexual Experiences and Attitudes Questionnaire included a public advocacy component. In the public advocacy portion, participants constructed a list of 3-5 reasons that people should use condoms during sexual intercourse. Using the list they created, participants wrote a brief speech (one paragraph) advocating for condoms (See Appendix F).

Safe Sex Experiences and Attitudes Questionnaire. The Safe Sex Behaviors and Attitudes Questionnaire was a 22-item questionnaire. The first nine questions (baseline survey) were from the Safe Sex Questionnaire and the last eleven questions (post-survey)

came from the Sexual Behaviors and Attitudes Questionnaire from Study 1.

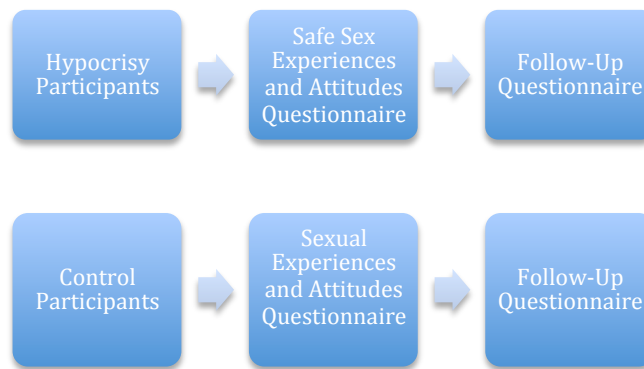
Additionally, the Safe Sex Experiences and Attitudes Questionnaire included the public advocacy component from the Sexual Experiences and Attitudes Questionnaire (See Appendix G).

Speech Content. A research assistant was recruited to provide content analyses on participants' public advocacy speeches. The research assistant was instructed to evaluate the quality of participants' writing. Specifically, the research assistant was asked to rate the speeches on a 5-point Likert scale. Sample anchors included low quality and high quality, not at all informative and very informative, inaccurate and accurate, and not at all persuasive and completely persuasive (See Appendix H).

Procedure

Part 1. Information about the current study and the survey link were distributed to Bates College students via announce emails. Participants were randomly assigned to the control or experimental condition through Qualtrics Survey Software. Some participants responded to the Sexual Experiences and Attitudes Questionnaire (control condition), while others completed the Safe Sex Experiences and Attitudes Questionnaire (experimental condition). If applicable, students received research credit towards their psychology class for participating. Participants were reminded that the current research consisted of two parts and they would receive a follow-up survey in one month via email.

Follow-up. Four weeks after completing the first survey, participants were sent an email containing a link to the Sexual Behaviors and Attitudes Follow-Up Questionnaire. After submitting the follow-up survey, participants' names were entered into a raffle for five \$10 gift certificates. See below for order of events.



Results

Preliminary Analyses

All participants who previously had sexual intercourse were included in the present data analyses ($n=64$). Preliminary two-sample independent t -tests were conducted to determine if there were any significant differences between hypocrisy and control participants at baseline survey. Results indicated no significant differences between control and hypocrisy participants in terms of class year, $\chi^2(3) = 1.07, p = .78$, or gender, $\chi^2(1) = 0.72, p = .40$. Additionally, results revealed no significant differences between hypocrisy and control participants for hormonal contraception use, $\chi^2(2) = 1.15, p = .56$, or relationship status, $\chi^2(2) = 2.18, p = .34$. The frequencies for both conditions at baseline survey can be found in Table 3.

Baseline survey and Post-Survey Analyses

Hypothesis testing. At post-survey, hypocrisy participants ($M = 3.35, SD = 1.41$) felt significantly more anxious than control participants ($M = 4.10, SD = 1.14$), $t(55) = 2.22, p = .03$, Cohen's $d = 0.58$. Additionally, hypocrisy participants ($M = 3.04, SD = .10$) felt marginally more ashamed than control participants ($M = 3.48, SD = .81$), $t(55) = 1.86, p = .07$, Cohen's $d = 0.76$. Results indicated no significant differences in

future motivation for or importance of safe sex between hypocrisy and control participants.

Demographic differences. To determine whether gender, relationship status, and use of hormonal contraception influenced dissonance arousal, additional two-sample independent *t*-tests and one-way ANOVAs were conducted. At post-survey, there were no significant differences in motivation to use condoms or importance of condom use between males and females. However, there was a trend towards significance in which females ($M = 4.05$, $SD = 1.20$) felt more comfortable than males ($M = 3.44$, $SD = 1.36$) at post-survey, $t(54) = 1.66$, $p = .10$, Cohen's $d = 0.48$.

A one-way ANOVA indicated that use of hormonal contraception significantly influenced comfort level at post-survey, $F(2,54) = 3.39$, $p = .04$. Tukey's HSD revealed that participants not taking hormonal contraception ($M = 4.57$, $SD = 1.09$), felt significantly more comfortable than participants taking hormonal contraception ($M = 3.72$, $SD = 1.22$), $p = .07$, Cohen's $d = 0.73$.

Additionally, one-way ANOVAs were conducted to determine whether relationship status affected participants' attitudes towards condoms. Results revealed that relationship status significantly influenced future motivation to use condoms, $F(2, 54) = 3.71$, $p = .03$. Specifically, Tukey's HSD revealed that participants who abstain from dating and hooking-up ($M = 4.86$, $SD = 0.38$) felt significantly more motivated to use condoms than participants in monogamous relationships ($M = 3.81$, $SD = 1.24$), $p = .05$, Cohen's $d = 1.14$.

Additionally, relationship status significantly affected shame, $F(2,54) = 7.26$, $p = .002$, comfort level, $F(2,54) = 5.07$, $p = .01$, and anxiety, $F(2,54) = 5.19$, $p = .009$. Post

hoc tests revealed that individuals hooking up felt more ashamed, uncomfortable and anxious than participants in relationships and participants abstaining from dating and relationships. The effect of relationship status on psychological distress can be found in Figure 3.

Follow-Up Analyses

Attrition analyses. Of the 63 participants who previously had sex, a total of 25 (40%) participants completed the follow-up survey. Preliminary two-sample independent *t*-tests were conducted to determine if there were significant differences between participants who did and did not complete the follow-up survey. Results indicated that participants who dropped out of the follow-up survey ($M = 3.62$, $SD = 1.28$) felt significantly more uncomfortable at post-survey than participants who completed the follow-up survey ($M = 4.30$, $SD = 1.15$), $t(55) = 2.07$, $p = .04$, Cohen's $d = 0.56$.

Hypothesis testing. Two-sample *t*-tests for independent groups were conducted to assess behavioral and attitudinal differences between hypocrisy and control participants at the one-month follow-up. Results indicated that hypocrisy participants ($M = 4.83$, $SD = .41$) were significantly more motivated to use condoms in the future than control participants ($M = 3.78$, $SD = 1.30$), $t(10.18) = 2.27$, $p = .05$. The effect size for this analysis was large, $d = 1.10$. However, there were no significant differences in number of condom bought, frequency of condom use, past month motivation, or importance of condom use between hypocrisy and control participants.

One-way ANOVAs with repeated measures were conducted to determine the effects of hypocrisy induction on behaviors and attitudes over time from post-survey to one-month follow-up. There was a significant time by condition interaction for future

motivation to use condoms, $F(1,13) = 4.12, p = .06$. Results indicated that control participants' future motivation decreased from post-survey to follow-up, while hypocrisy participants' motivation increased over time, as shown in Figure 4.

Demographic Differences. Additional one-way ANOVAs with repeated measures were conducted to determine if long-term attitudes and behaviors differed for males versus females, individuals in relationships versus individuals hooking up, and participants taking hormonal contraception versus those not taking hormonal contraception. At the one-month follow-up, there was a significant interaction between time and gender on importance of condom use, $F(1,12) = 8.33, p = .01$. At post-survey, females ($M = 4.14, SD = .37$) valued condoms more than males ($M = 3.86, SD = .30$), however, males ($M = 4.43, SD = .37$) valued condoms more strongly than females ($M = 4.00, SD = .37$) at the one-month follow-up. There was also a significant time by gender interaction on frequency of condom use, $F(1,13) = 5.16, p = .04$. Specifically, females' condom use decreased from initial study to one-month follow-up, and males' condom use increased from post-survey to follow-up, as shown in Figure 5.

One-way ANOVAs with repeated measures were conducted to determine if hormonal contraception use and relationship status affected safe sex attitudes and behaviors over time. There was a significant time by use of hormonal contraception interaction on motivation to use condoms in the past month, $F(1,21) = 9.02, p = .007$. At post-survey, individuals taking hormonal contraception were slightly less motivated than individuals not taking hormonal contraception, however, at the one-month follow-up, individuals taking hormonal contraception were more motivated than individuals not taking hormonal contraception, as shown in Figure 6.

Content Analyses

Two-sample independent *t*-tests were computed to determine if condition affected the quality of participants' written public advocacy speeches. Results indicated no significant differences in terms of informativeness, quality, accuracy, detail, or persuasiveness between hypocrisy or control participants. The means and standard deviations for both conditions during public advocacy can be found in Table 4. See below for an example of a public advocacy speech.

Do you want to go to the pharmacy and get your medicine for Chlamydia? Do you want to go through the decisions that come along with an unplanned pregnancy? Not using a condom is simply not worth it. If you're going to have sex, then it shouldn't be something you worry about the next morning. 1 in 3 people have an STI of some sort, so you're running a risk with every partner, and you certainly don't want to be telling every other potential partner of yours that you have an STI.

Discussion

The current study administered an online hypocrisy intervention to improve undergraduates' safe sex attitudes and behaviors. Study 2 produced both anticipated and unexpected results. As hypothesized, emotional distress was greater for hypocrisy participants than control participants at post-survey. However, there was no difference in future motivation between hypocrisy and control participants at post-survey. Though non-significant, these results were consistent with Aronson et al.'s (1991) findings.

Additional analyses indicated that demographic variables impacted dissonance arousal. For example, males and individuals taking hormonal contraception experienced more emotional distress at post-survey than females and individuals not using hormonal contraception, respectively. Because they are less likely to use condoms, perhaps

individuals taking hormonal contraception experienced more dissonance and guilt when hypocrisy was induced (Civic, 2000). Based upon previous literature on hypocrisy induction and cognitive dissonance, these results suggested that positive behavioral and attitudinal changes would occur for males and individuals taking hormonal contraception.

Follow-up data revealed improved safe sex attitudes and practices among some participants. At the one-month follow-up, hypocrisy participants, males, and individuals taking hormonal contraception demonstrated more intent to practice safe sex than their respective counterparts. These results were anticipated based on previous hypocrisy induction research. It is particularly significant that motivation was higher among hormonal contraception users at the one-month follow-up given that hormonal contraception is the strongest predictor of condom nonuse. The fact that the current study was able to address the inverse correlation between condom use and hormonal contraception demonstrates the strength of an online hypocrisy induction. These results indicate that online hypocrisy interventions are efficacious even for individuals with less motivation and willingness to engage in safe sex.

General Discussion

Overall, Studies 1 and 2 produced some similar and significant findings. In both experiments, motivation to use condoms was higher for hypocrisy participants than for control participants at the one-month follow-up. Additionally, long-term safe sex practices improved for males, but not females in Studies 1 and 2. These findings have important implications for future research. If they are aware of which demographic variables are associated with more positive outcomes, then researchers know for whom

they should and should not induce hypocrisy. This knowledge will allow for more specific and effective safe sex interventions in the future.

Examining the differences between Study 1 and Study 2 results revealed important distinctions between in-person and online hypocrisy interventions. It was both unexpected and disconcerting that hypocrisy participants' motivation to practice safe sex decreased over time in Study 1. In contrast, hypocrisy participants' motivation to use condoms increased from post-survey to follow-up survey in Study 2. Such findings support the hypothesis that there is a threshold for attitudinal and behavioral changes. Perhaps an in-person hypocrisy intervention stimulates too much dissonance and physiological arousal for hypocrisy participants, which is debilitating rather than beneficial for attitudinal adjustments. An online survey provides increased privacy and comfort during dissonance induction, which might encourage more positive outcomes for participants.

Additionally, there was a surprising trend that was limited to Study 1. Based on previous hypocrisy induction research, it was expected that dissonance at post-survey would be associated with long-term positive changes. However, only Study 2 results were consistent with the hypocrisy literature. Unexpectedly, participants with less emotional distress at post-survey (i.e. males) demonstrated increased frequency of safe sex at the Study 1 follow-up. In contrast, frequency of condom use decreased for individuals who experienced more psychological distress at post-survey. This finding also seems to corroborate the notion that there is a threshold for discomfort and distress. Perhaps females experienced too much emotional distress at post-survey, which inhibited positive behavioral and attitudinal changes.

Also, hormonal contraception influenced the efficacy of hypocrisy induction in Study 2, but not in Study 1. This result is particularly important, as hormonal contraception users tend to demonstrate less motivation and frequency of safe sex. The finding that motivation to use condoms was higher for hormonal contraception users at the Study 2 follow-up has two very important implications. First, it corroborates LaBrie et al.'s (2006) conclusion that motivation-based safe sex interventions are especially effective at stimulating positive changes among individuals who are resistant and unmotivated to adapt their behaviors. Second, it suggests that online hypocrisy inductions have the potential to decrease the prevalence of STIs among undergraduates since these interventions are particularly effective for individuals who typically demonstrate low condom use.

Limitations and Future Research

Despite significant results, there are important limitations of the current research and results. First, comparing Study 1 and Study 2 findings is important, but potentially misleading. For example, it might be enticing for future researchers to discard in-person hypocrisy interventions in favor of online interventions, as Study 2 produced more positive results for hypocrisy participants, males, and hormonal contraception users. However, more research must be conducted to determine whether the different results between Studies 1 and 2 were a product of the methodologies or distinct samples. Perhaps the higher percentages of first-year students and males in Study 1 contributed to the different findings. Consequently, more research is needed in order for researchers to thoroughly and accurately assess the advantages and disadvantages of in-person and online hypocrisy interventions.

Additionally, the small, homogenous samples in both experiments are significant shortcomings of the current research. At a small liberal arts college, it is difficult to recruit large samples with diverse attitudes and sexual behaviors. For example, the majority of participants in Study 1 and Study 2 either used condoms or hormonal contraception consistently. Thus, participants in the current research might only be representative of individuals who are more motivated to practice safe sex. As a result of the small sample size, the external validity of the current research is limited. Future research should include a larger sample of participants with varying sexual behaviors.

Another important limitation for Studies 1 and 2 was the time constraint. Due to time restrictions, the follow-up surveys were administered one month, rather than three months, after post-survey. The fact that frequency of condom use did not differ between hypocrisy and control participants at the follow-up studies is probably due to the shorter time elapsed. Consequently, future research should distribute the follow-up surveys three months after the initial studies in order to observe changes in both attitudes and behaviors.

Some limitations are specific to Study 2. For example, it was impossible to measure participants' heart rates and immediate consumption of condoms in an online survey. Consequently, Study 2 had fewer measures to assess physiological arousal and immediate effects of dissonance on safe sex behavior. Additionally, the public advocacy component was much more private in Study 2. Future online hypocrisy interventions should explore the possibility of including audio and/or video recording as part of the survey. In spite of the limitations, the current research has very important implications for public health.

The high prevalence of STIs among college students indicates the necessity and urgency of implementing effective safe sex interventions for this age group. The current research demonstrated the efficacy of hypocrisy induction for promoting safe sex attitudes and behaviors among undergraduates. Further, Study 2 indicated that hypocrisy could be induced using less expensive and more far-reaching methods. Although additional research is necessary, the current research represents an important first step towards developing more effective and cost-efficient safe sex interventions.

Both experiments contributed significant findings, which improve upon existing literature about hypocrisy induction. To date, no other hypocrisy safe sex intervention has simultaneously measured physiological and emotional responses to dissonance. Measuring participants' heart rates and psychological distress revealed the unanticipated result that too much dissonance might be debilitating rather than beneficial. Though more research is needed to confirm this hypothesis, it has important implications for future research. Knowing that in-person hypocrisy interventions might be harmful, rather than helpful, to hypocrisy and control participants' sexual health indicates the need for researchers to explore alternative, more efficacious safe sex interventions. Thus, one of the most significant findings and contributions of the current research was the result that online hypocrisy interventions are capable of producing long-term positive changes. If online hypocrisy interventions can improve safe sex attitudes and practices, and Internet-based research can reach larger populations, then the present research has the potential to significantly decrease the spread of STIs among young adults across the country. Further, the United States healthcare system spends an estimated \$16 billion on medical costs associated with STIs (CDC, 2013). Consequently, developing and implementing

efficacious and cost-efficient safe sex interventions, like online hypocrisy inductions, can save both lives and money.

References

- Aronson, E., Fried, C., & Stone, J. (1991). Overcoming denial and increasing the intention to use condoms through the induction of hypocrisy. *American Journal of Public Health, 81*(12), 1636-1638. doi:10.2105/AJPH.81.12.1636.
- Bowen, A. M., Williams, M. L., Daniel, C. M., & Clayton, S. (2008). Internet based HIV prevention research targeting rural MSM: Feasibility, acceptability, and preliminary efficacy. *Journal of Behavioral Medicine, 31*(6), 463-477.
- Brehm, J. W. (2007). A brief history of dissonance theory. *Social and Personality Psychology Compass, 1*(1), 381-391.
- Bryan, A. D., Aiken, L. S., & West, S. G. (1996). Increasing condom use: Evaluation of a theory-based intervention to prevent sexually transmitted diseases in young women. *Health Psychology, 15*(5), 371-382. doi:10.1037/0278-6133.15.5.371.
- Centers for Disease Control and Prevention (2013). Incidence, prevalence, and cost of sexually transmitted infections in the United States. *CDC Fact Sheet*. Retrieved on February 2014, from <http://www.cdc.gov/std/stats/sti-estimates-fact-sheet-feb-2013.pdf>.
- Civic, D. (2000). College students' reasons for nonuse of condoms within dating relationships. *Journal of Sex and Marital Therapy, 26*, 95-105.
- Dermen, K. H., & Thomas, S. N. (2011). Randomized controlled trial of brief interventions to reduce college students' drinking and risky sex. *Psychology Of Addictive Behaviors, 25*(4), 583-594. doi:10.1037/a0025472.

- Fullerton, T., Rye, B. J., Meaney, G. J., & Loomis, C. (2013). Condom and hormonal contraceptive use by young women: An information-motivation-behavioral skills assessment. *Canadian Journal of Behavioral Science, 45*(3), 196-209.
- Freijy, T. & Kothe, E. (2013). Dissonance-based interventions for health behavior change: A systematic review. *British Journal of Health Psychology, 18*(2), 310-337.
- Hafstad, A. , Aaro, L. E., Engeland, A., Andersen, A. A., Langmark, F., & Stray-Pedersen, B. (1997). Provocative appeals in anti-smoking mass media campaigns targeting adolescents— the accumulated effect of multiple exposures. *Health Education Research, 12*, 227-236.
- LaBrie, J. W., Pedersen, E. R., Thompson, A. D., & Earleywine, M. (2008). A brief decisional balance intervention increases motivation and behavior regarding condom use in high-risk heterosexual college men. *Archives of Sexual Behavior, 37*(2), 330-339. doi:10.1007/s10508-007-9195-y.
- Langdon, S. (2014). Using the cognitive dissonance theory and dissonance reduction to understand hard alcohol consumption in college students. Manuscript submitted for publication.
- Lewis, M. A., Granato, H., Blayney, Lostutter, T. W., & Kilmer, J. R. (2012). Predictors of hooking up, sexual behaviors and emotional reactions among U.S. college students. *Archives of Sexual Behaviors, 41*, 1219-1229.
- McKay, A., & Bissel, M. (2010). Sexual health education in the schools: Questions and answers. *Sex Information and Education Council of Canada*. Retrieved on March 16, 2015, from http://www.sieccan.org/pdf/she_q&a_3rd.pdf.

- Mevisen, F., Ruiter, R., Meertens, R., Zimbile, F., & Schaalma, H. (2011). Justify you love: Testing an online STI-risk communication intervention designed to promote condom use and STI-testing. *Psychology and Health, 26*(2), 205-221.
- Murray, S. R. & Miller, J. L. (2000). Birth control and condom use among college students. *California Association for Health, Physical Education, Recreation, and Dance Journal, 25*(1), 1-3.
- Noll, J. G., Trickett, P. K., & Putnam, F. W. (2003). Sexual activities and attitudes questionnaire. *Journal of Consulting and Clinical Psychology, 71*(3), 575-586.
- Patrick, M. E. (2013). Daily associations of alcohol use with sexual behavior and condom use during spring break. *Drug Alcohol Review, 32*(2), 215-217.
- Stone, J., Aronson, E., Crain, L., Winslow, M. P., & Fried, C. B. (1994). Inducing hypocrisy as a means of encouraging young adults to use condoms. *Personality and Social Psychology Bulletin, 20*, 116-128.
- Stone, J. & Fernandez, N. C. (2008). To practice what we preach: The use of hypocrisy and cognitive dissonance to motivate behavior change. *Social and Personality Psychology Compass 2*(2), 1024-1051.
- Walsh, J. L., Fielder, K. B., Carey, K. B., & Carey, M. P. (2013). Change in women's condom use over the first year of college. *Journal of Sex Research, 50*(2), 128-135.
- Ward, W. D., & Carlson, W. A. (1964). Cognitive dissonance, opinion change and physiological arousal. *Journal of General Psychology, 71*(1), 115-124.

Appendix A
Sexual Experience Questionnaire

In the space below, please write your email address and your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code

I.e. John Upton Doe, born on May 31 to Mabel Maidenname Doe with zip code 12345 would have this participant ID: UPMA3145

1. Please indicate your gender
 - a. Male
 - b. Female
 - c. Other
2. Please indicate your class year
 - a. First year student
 - b. Sophomore
 - c. Junior
 - d. Senior
3. Have you had sexual intercourse before?
 - a. Yes
 - b. No
4. Have you had sexual intercourse in the past month?
 - a. Yes
 - b. No
5. How old were you when you had sexual intercourse for the first time?
 - a. Less than 15
 - b. 15-16
 - c. 17-18
 - d. 19-20
 - e. 21 or over
 - f. I have never had sex
6. Please indicate the number of sexual partners you have had in the past month: _____
7. On average, how many times do you had sex per month?
 - a. 0
 - b. 1
 - c. 2
 - d. 3-4
 - e. 5-7
 - f. 8-10
 - g. 11 or more

Appendix B

Safe Sex Questionnaire

In the space below, please write your email address and your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code

I.e. John Upton Doe, born on May 31 to Mabel Maidenname Doe with zip code 12345 would have this participant ID: UPMA3145

1. Please indicate your gender
 - a. Male
 - b. Female
 - c. Other
2. Please indicate your class year
 - a. First year student
 - b. Sophomore
 - c. Junior
 - d. Senior
3. Have you had sexual intercourse before?
 - a. Yes
 - b. No
4. Have you had sexual intercourse in the past month?
 - a. Yes
 - b. No
5. On average, how many times do you have sex per month?
 - a. 0
 - b. 1
 - c. 2
 - d. 3-4
 - e. 5-7
 - f. 8-10
 - g. 11 or more
 - h. Never had or not currently having sex
6. How frequently do you use condoms during sexual intercourse?
 - a. 100% of the time
 - b. 75% of the time
 - c. 50% of the time
 - d. 25% of the time
 - e. I never use condoms
 - f. Never had sex or not currently having sex

7. Please indicate the last time you did NOT use a condom during sexual intercourse?
- I didn't use a condom within the last week
 - I didn't use a condom within the last month
 - I didn't use a condom within the last six months
 - I didn't use a condom within the last year
 - I didn't use a condom within the last three years
 - I always use a condom
 - Never had sex or not currently having sex
8. Please write a brief sentence about the most recent incident in which you did NOT use a condom during sexual intercourse (i.e. with whom, when, why?)
- ---

9. Please check all that apply to you:
- I don't use condoms during sex because I (or my partner) use hormonal contraception
 - I don't use condoms during sex because I know my partner(s)'s sexual history
 - I don't use condoms during sex because I feel that the risk of contracting an STI is low
 - I don't use condoms during sex because I don't like the way they feel
 - I don't use condoms during sex because I don't feel comfortable discussing condom use with my partner
 - Other (please explain):

Appendix C

Sexual Behaviors and Attitudes Questionnaire

In the space below, please write your email address AND your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code.

1. Please indicate your current relationship status
 - a. In a relationship
 - b. Not in a monogamous relationship but hook-up
 - c. Abstain from dating and hooking up
2. Do you (or your partner(s)) use hormonal contraception?
 - a. Yes
 - b. No
 - c. I don't know
3. If you (or your partner(s)) use hormonal contraception, please indicate which type you or she uses
 - a. Birth control pills
 - b. Intrauterine device (IUD)
 - c. Depo Provera (shot)
 - d. Monthly vaginal ring
 - e. Other: _____
 - f. I don't know
 - g. I (or she) don't use hormonal contraception
4. Please estimate how many condoms you purchased or took for free (i.e. from health center, dorm bathroom, etc.) in the past month
 - a. _____
5. How often do you use condoms during sex?
 - a. 100% of the time
 - b. 75% of the time
 - c. 50% of the time
 - d. 25% of the time
 - e. I never use condoms
 - f. Never had sex
6. How important is consistent condom use to you?
 - a. Not at all important o o o o Very important
7. How motivated are you to use condoms in the future?
 - a. Not at all motivated o o o o Very motivated
8. After answering these questions, I feel...
 - a. Anxious o o o o Calm

9. After answering these questions, I feel...
 - a. Guilty o o o o o Innocent

10. After answering these questions, I feel...
 - a. Uncomfortable o o o o o Comfortable

11. After answering these questions, I feel...
 - a. Ashamed o o o o o Proud

Appendix D

Sexual Behaviors and Attitudes Follow-Up Questionnaire

In the space below, please write your email address and your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code

I.e. John Upton Doe, born on May 31 to Mabel Maidenname Doe with zip code 12345 would have this participant ID: UPMA3145

1. Please indicate your gender
 - a. Female
 - b. Male
 - c. Other
2. Please indicate your class year
 - a. First year student
 - b. Sophomore
 - c. Junior
 - d. Senior
3. What is your current relationship?
 - a. In a relationship
 - b. Not in monogamous relationship but hook-up
 - c. Abstain from dating and hooking up
4. In the past month, has your relationship status changed?
 - a. No
 - b. Yes, I am currently in a relationship
 - c. Yes, I am no longer in a relationship
 - d. Yes, I am no longer abstaining from hooking up and dating
 - e. Yes, I am now abstaining from hooking up and dating
5. How many times did you have sexual intercourse in the past month?
 - a. 0
 - b. 1
 - c. 2
 - d. 3-4
 - e. 5-7
 - f. 8-10
 - g. 11 or more
 - h. I have never had sex
6. Have you (or your partner(s)) used hormonal contraception in the past month?
 - a. Yes
 - b. No
 - c. I don't know

7. In the past month, how often have you used condoms during sex?
 - a. 100% of the time
 - b. 75% of the time
 - c. 50% of the time
 - d. 25% of the time
 - e. I didn't use condoms at all during sex
 - f. I have never had sex
8. Please estimate how many condoms you purchased or took for free (i.e. from health center, dorm bathrooms, etc.) in the past month
 - a. _____
9. How motivated have you been to use condoms in the past month?
 - a. Not at all motivated Very motivated
10. How motivated are you to use condoms in the future?
 - a. Not at all motivated Very motivated
11. How important is consistent condom use to you?
 - a. Not at all important Very important

Appendix E

Speech Content Study 1

1. How would you describe the participant?
 - a. Calm Anxious
 - b. Proud Ashamed
 - c. Comfortable Uncomfortable

2. How would describe the speech?
 - a. Not at all informative Very informative
 - b. Inaccurate Accurate
 - c. Not at all persuasive Completely persuasive
 - d. Not at all detailed Very detailed

Appendix F

Sexual Experiences and Attitudes Questionnaire

In the space below, please write your email address and your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code

I.e. John Upton Doe, born on May 31 to Mabel Maidenname Doe with zip code 12345 would have this participant ID: UPMA3145

1. Please indicate your gender
 - a. Male
 - b. Female
 - c. Other
2. Please indicate your class year
 - a. First year student
 - b. Sophomore
 - c. Junior
 - d. Senior
3. Have you had sexual intercourse before?
 - a. Yes
 - b. No
4. Have you had sexual intercourse in the past month?
 - a. Yes
 - b. No
5. How old were you when you had sexual intercourse for the first time?
 - a. Less than 15
 - b. 15-16
 - c. 17-18
 - d. 19-20
 - e. 21 or over
 - f. I have never had sex
6. Please indicate the number of sexual partners you have had in the past month: _____
7. On average, how many times do you had sex per month?
 - a. 0
 - b. 1
 - c. 2
 - d. 3-4
 - e. 5-7
 - f. 8-10
 - g. 11 or more

8. One goal of the present research is to compile a list of reasons that adolescent should consistently use condoms. The list generated in the study will be used to develop a safe sex intervention for high school students. In the space below, please write at least 4 reasons why people should use condoms.
- a. _____

9. Using the list you created, please write a one-paragraph speech advocating safe sex.
- a. _____

10. Please indicate your current relationship status
- In a relationship
 - Not in a monogamous relationship but hook-up
 - Abstain from dating and hooking up
11. Do you (or your partner(s)) use hormonal contraception?
- Yes
 - No
 - I don't know
12. If you (or your partner(s)) use hormonal contraception, please indicate which type you or she uses
- Birth control pills
 - Intrauterine device (IUD)
 - Depo Provera (shot)
 - Monthly vaginal ring
 - Other: _____
 - I don't know
 - I (or she) don't use hormonal contraception
13. Please estimate how many condoms you purchase or took for free (i.e. from health center, dorm bathroom, etc.) in the past month
- a. _____
14. How often do you use condoms during sex?
- 100% of the time
 - 75% of the time
 - 50% of the time
 - 25% of the time
 - I never use condoms

- f. Never had sex
- 15. How important is consistent condom use to you?
 - a. Not at all important Very important
- 16. How motivated are you to use condoms in the future?
 - a. Not at all motivated Very motivated
- 17. After answering these questions, I feel...
 - a. Anxious Calm
- 18. After answering these questions, I feel...
 - a. Guilty Innocent
- 19. After answering these questions, I feel...
 - a. Uncomfortable Comfortable
- 20. After answering these questions, I feel
 - a. Ashamed Proud

Appendix G

Safe Sex Experiences and Attitudes Questionnaire

In the space below, please write your email address and your Participant ID:

Participant ID: first two letters of middle name, first two letters of mother's maiden name, day of the month of your birthday (i.e. 01-31), and last two digits of your home address zip code

I.e. John Upton Doe, born on May 31 to Mabel Maidenname Doe with zip code 12345 would have this participant ID: UPMA3145

1. Please indicate your gender
 - a. Male
 - b. Female
 - c. Other
2. Please indicate your class year
 - a. First year student
 - b. Sophomore
 - c. Junior
 - d. Senior
3. Have you had sexual intercourse before?
 - a. Yes
 - b. No
4. Have you had sexual intercourse in the past month?
 - a. Yes
 - b. No
5. On average, how many times do you have sex per month?
 - a. 0
 - b. 1
 - c. 2
 - d. 3-4
 - e. 5-7
 - f. 8-10
 - g. 11 or more
 - h. Never had or not currently having sex
6. How frequently do you use condoms during sex?
 - a. 100% of the time
 - b. 75% of the time
 - c. 50% of the time
 - d. 25% of the time
 - e. I never use condoms
 - f. Never had or not currently having sex
7. Please indicate the last time you did NOT use a condom during sexual intercourse

- a. I didn't use a condom within the last week
 - b. I didn't use a condom within the last month
 - c. I didn't use a condom within the last six months
 - d. I didn't use a condom within the last year
 - e. I didn't use a condom within the last three years
 - f. I always use a condom
 - g. Never had sex or not currently having sex
8. Please write a brief sentence about the most recent incident in which you did NOT use a condom during sex (i.e. with whom, when, why?)
- a. _____

9. Please check all that apply to you
- a. I don't use condoms during sex because I (or my partner) use hormonal contraception
 - b. I don't use condoms during sex because I know my partner's sexual history
 - c. I don't use condoms during sex because I feel that the risk of contracting an STI is low
 - d. I don't use condoms during sex because I don't like the way they feel
 - e. I don't use condoms during sex because I don't feel comfortable discussing condom use with my partner
 - f. Other (please specify): _____
10. One goal of the present research is to compile a list of reasons that adolescent should consistently use condoms. The list generated in the study will be used to develop a safe sex intervention for high school students. In the space below, please write at least 4 reasons why people should use condoms.
- a. _____

11. Using the list you created, please write a one-paragraph speech advocating safe sex.
- a. _____

12. Please indicate your current relationship status
- a. In a monogamous relationship
 - b. Not in monogamous relations but hook-up
 - c. Abstain from dating and hooking up

13. Do you (or your partner(s)) use hormonal contraception?
 - a. Yes
 - b. No
 - c. I don't know
14. If you (or your partner) use hormonal contraception, please indicate which one you or she use:
 - a. Birth control pills
 - b. Intrauterine device (IUD)
 - c. Depo provera (shot)
 - d. Monthly vaginal ring
 - e. Other: _____
 - f. I don't know
 - g. I (or she) don't use hormonal contraception
15. Please estimate how many condoms you purchased or took for free (i.e. from health center, dorm bathroom, etc.) in the past month
 - a. _____
16. How often do you use condoms during sex?
 - a. 100% of the time
 - b. 75% of the time
 - c. 50% of the time
 - d. 25% of the time
 - e. I never use condoms
 - f. Never had sex
17. How important is consistent condom use to you?
 - a. Not at all important Very important
18. How motivated are you to use condoms in the future?
 - a. Not at all motivated Very motivated
19. After answering these questions, I feel...
 - a. Anxious Calm
20. After answering these questions, I feel...
 - a. Guilty Innocent
21. After answering these questions, I feel...
 - a. Uncomfortable Comfortable
22. After answering these questions, I feel...
 - a. Ashamed Proud

Appendix H

Speech Content Study 2

1. How would you describe the speech?
 - a. Not at all informative Very informative
 - b. Inaccurate Accurate
 - c. Not at all persuasive Completely persuasive
 - d. Not at all detailed Very detailed

Table 1
Study 1 Baseline survey Frequencies

		Relationship Status		
Condition	Control Hypocrisy	In relationship	Hooking Up	Abstain
		31%	50%	19%
		26%	44%	30%
		Use Hormonal Contraception		
Condition	Control Hypocrisy	Yes	No	I Don't Know
		65%	25%	10%
		37%	37%	26%
		Gender		
Condition	Control Hypocrisy	Male	Female	Other
		54%	46%	0%
		44%	56%	0%
		Frequency of Sex Last Month		
Condition	Control Hypocrisy	1-4	5-10	11 or more
		29%	16%	55%%
		23%	20%	57%

Table 2
Study 1 Means and Standard Deviations for Content Analysis

Group Statistics

	condition	N	Mean	Std. Deviation	Std. Error Mean
calm	Control	25	2.8000	1.15470	.23094
	Hyp	26	2.6923	1.25759	.24663
proud	Control	25	2.7200	.97980	.19596
	Hyp	26	2.9615	.82369	.16154
comfortable	Control	25	2.6800	.98826	.19765
	Hyp	26	2.8846	1.10732	.21716
inform	Control	25	2.9600	.97809	.19562
	Hyp	26	3.0385	.91568	.17958
quality	Control	25	3.1200	1.05357	.21071
	Hyp	26	3.0000	1.05830	.20755
accuracy	Control	25	3.9200	.64031	.12806
	Hyp	26	4.0769	.84489	.16570
persuas	Control	25	3.2000	1.19024	.23805
	Hyp	26	2.8462	1.12044	.21974
detail	Control	25	2.8800	.88129	.17626
	Hyp	26	2.8846	.99305	.19475

Table 3
Study 2 Baseline survey Frequencies

		Relationship Status		
Condition	Control Hypocrisy	In relationship	Hooking Up	Abstain
		52%	32%	16%
		42%	50%	8%
		Use Hormonal Contraception		
Condition	Control Hypocrisy	Yes	No	I Don't Know
		68%	29%%	3%
		73%	19%	8%
		Gender		
Condition	Control Hypocrisy	Male	Female	Other
		33%	66%	0%
		23%	77%	0%
		Frequency of Sex Last Month		
Condition	Control Hypocrisy	1-4	5-10	11 or more
		45%	47%	24%%
		50%	37%	13%

Table 4
Study 2 Means and Standard Deviations for Content Analysis

Group Statistics					
	Condition	N	Mean	Std. Deviation	Std. Error Mean
inform	1.00	26	3.1923	.98058	.19231
	2.00	23	2.9565	1.14726	.23922
quality	1.00	26	3.0769	.93480	.18333
	2.00	23	2.9130	1.08347	.22592
accuracy	1.00	26	2.8846	.86380	.16941
	2.00	23	3.3913	1.07615	.22439
persuasion	1.00	26	3.1923	1.02056	.20015
	2.00	23	3.2174	1.08530	.22630
detail	1.00	26	2.6154	.85215	.16712
	2.00	23	2.6522	1.26522	.26382

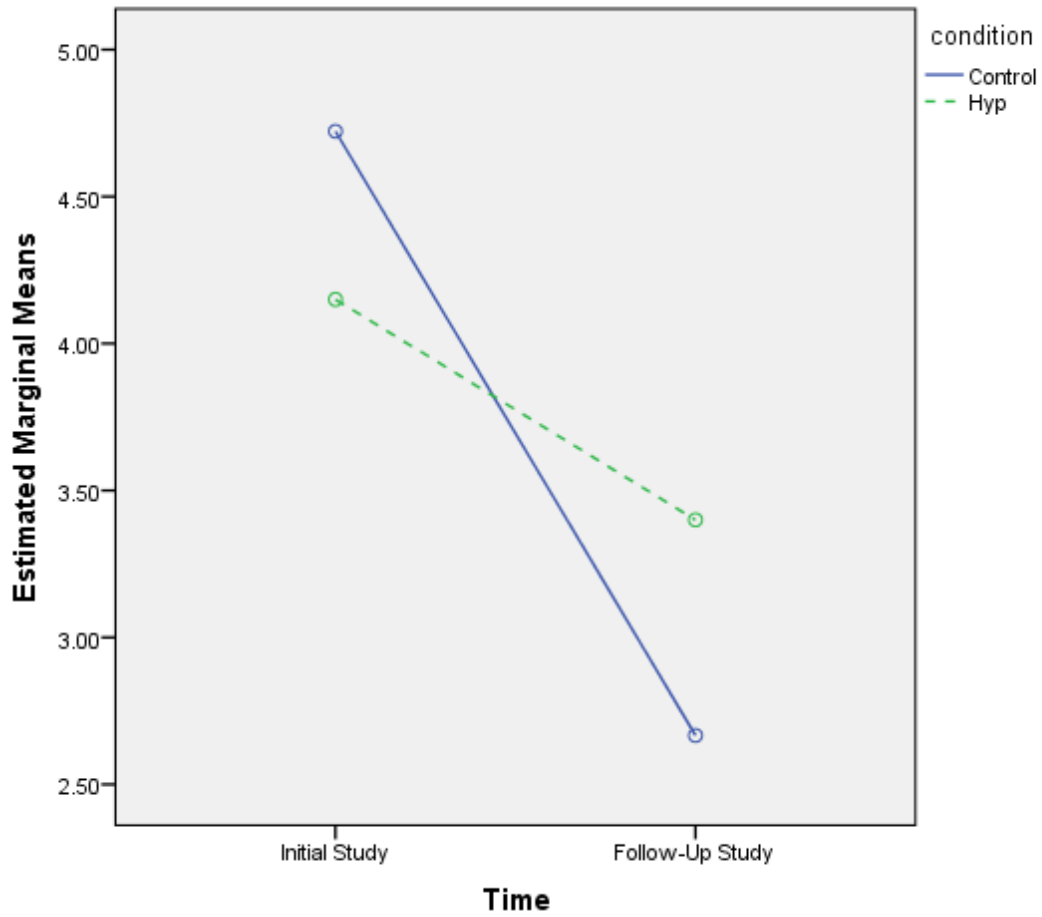


Figure 1. Results from Study 1. The effect of time and condition on past month motivation to use condoms. Control and hypocrisy participants' motivation to use condoms decreased between post-survey and one-month follow-up.

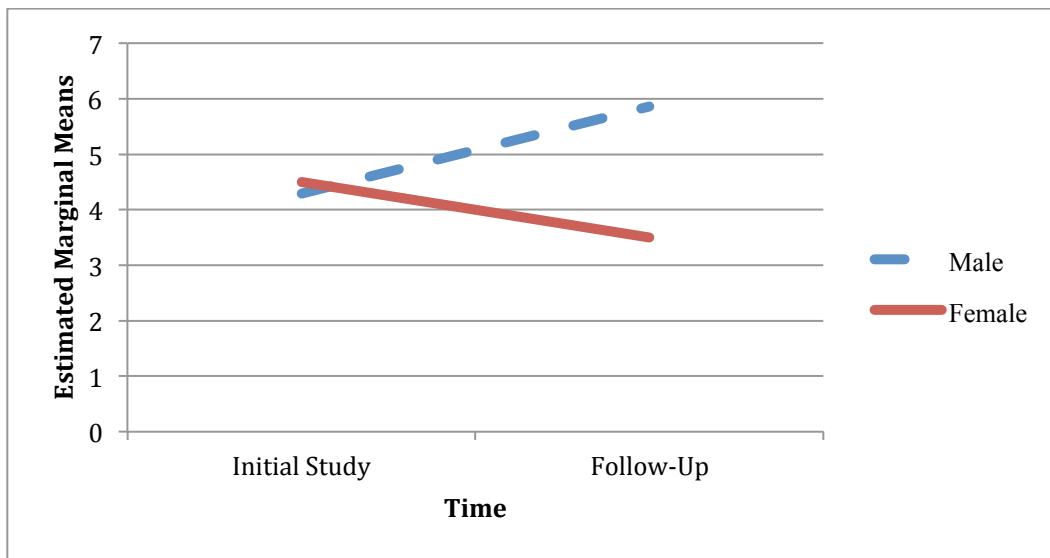


Figure 2. Results from Study 1. The effect of time and gender on past month frequency of condom use. Males' condom use increased over time, while females' condom use decreased between post-survey and follow-up.

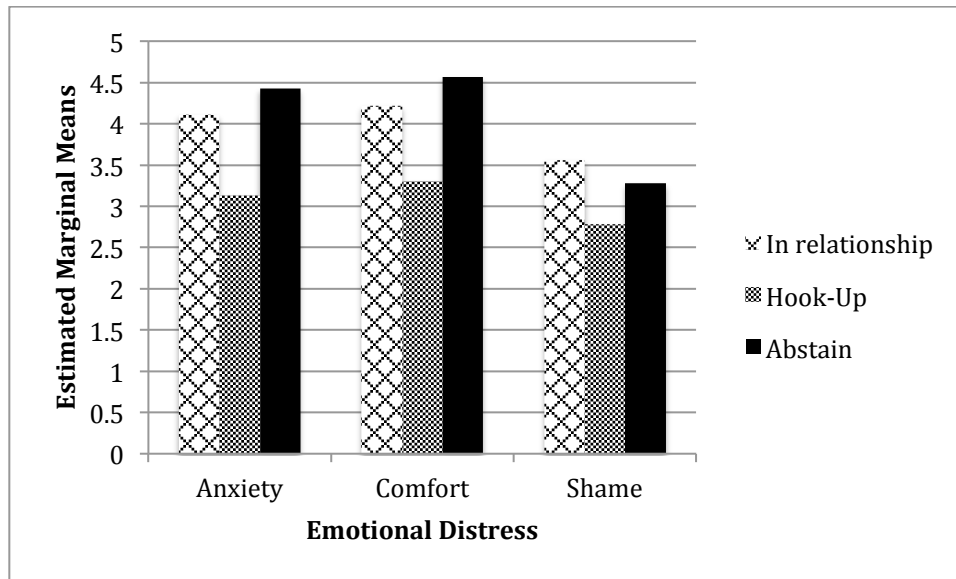


Figure 3. Results from Study 2. The effect of relationship status on anxiety, shame, and comfort. Participants hooking up felt more anxious, uncomfortable, and ashamed than participants in relationships and participants abstaining from dating and hooking up.

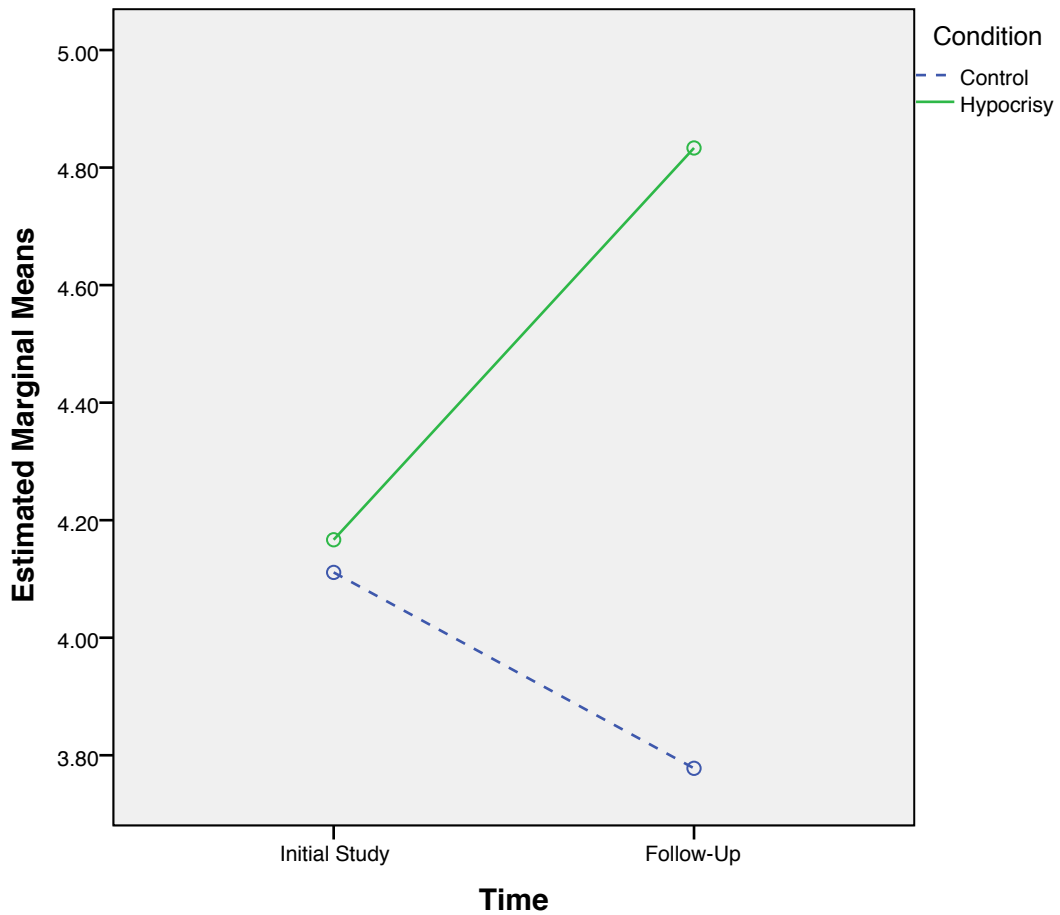


Figure 4. Results from Study 2. Effects of time and condition on future motivation to use condoms. Hypocrisy participants' motivation to use condoms increased over time, while control participants' motivation decreased from post-survey to follow-up.

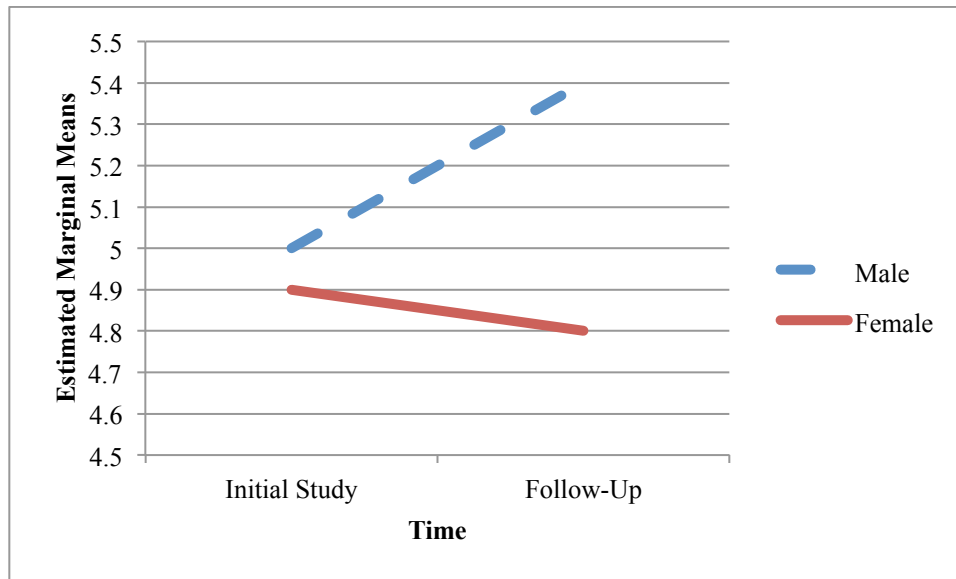


Figure 5. Results from Study 2. Effect of time and gender on past month frequency of condom use. Males' condom use increased over time, while females' condom use decreased from post-survey to follow-up.

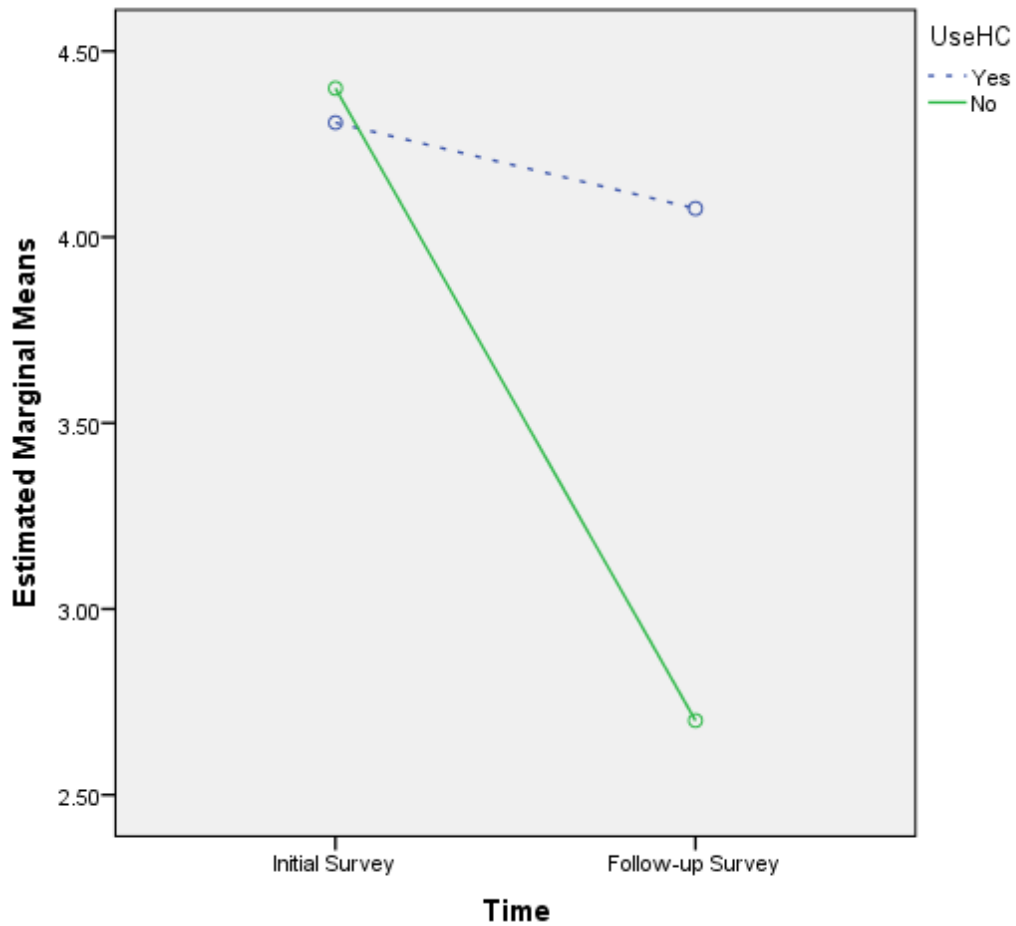


Figure 6. Results from Study 2. Effect of time and hormonal contraception use on past month motivation to use condoms. At the one-month follow-up, participants using hormonal contraception had significantly more motivation to practice safe sex than participants not using hormonal contraception.