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# Semantic priming and health risk: a dual-process approach

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**Semantic priming and health risk: A dual-process approach**

by

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A thesis submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of

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## ABSTRACT

Dual process theories propose that people possess two information processing systems (rational vs. experiential). The present study used two semantic priming techniques to influence health risk decisions via the two processing systems. Baseline measures of sexual attitudes (erotophobia), and willingness and intentions to engage in risky sexual, alcohol, and drug use behaviors were collected from 183 college males. Participants were then subliminally or supraliminally primed with the concept of sex while performing a lexical decision task. Changes in willingness and intentions were examined. Results yielded no clear pattern of priming effects on health risk decisions, although there was evidence that priming reduced response times to the questionnaire items. Study limitations and implications of priming on health risk decisions are discussed.

## CHAPTER 1. INTRODUCTION

Despite recent trends suggesting that teenage pregnancy and STD rates have decreased over the last 10 years (CDC, 2002a), adolescent sexual risk behavior remains a serious concern (USDHHS, 2001). Teen pregnancy rates are four times higher in the United States than in other industrialized nations (CDC, 2002b), and a disproportionate number of teens are infected with STD's every year compared to other demographic groups (USDHHS, 2001). With various birth control and STD protection methods widely available to the public, how is it that teens are still putting themselves at such risk by engaging in risky sexual behaviors? Research has suggested that oftentimes, sexually active teens weren't planning to have sex prior to the first (or even subsequent) intercourse (Coblner, 1974; Gibbons, Gerrard, & Lane, 2003). Furthermore, those teens that were planning specifically on abstaining, who then do have sex, are less likely to use contraception at first intercourse (Bearman, Bruckner, 2001). Intuition and research both suggest that adolescents often find themselves in risky situations for which they are unprepared, and then put themselves at risk for contracting STD's and unwanted pregnancies.

How might we better understand the various factors that influence one's decision to engage in sexual intercourse, especially when that decision might put that person at risk? Research has reliably demonstrated that demographic factors such as poverty and family structure are associated with early and risky sexual behaviors. For example the likelihood of becoming sexually active between the ages of 12 and 20 decreases (i.e. the age of first intercourse is higher) as the proportion of the local population with a college education increases (Brewster, Billy, & Grady,



1993). Also, living in a nonintact family elevates the risk of sexual activity.

Psychosocial factors such as perceived peer norms and alcohol and drug use are also associated with early and risky sexual behaviors (Santelli, Kaiser, Hirsch, Radosh, Simkin, & Middlestadt, 2004; Stacy, Stein, & Longshore, 1999). For example lack of condom use among drug users is a well-known cause of the spread of HIV (Bowen & Trotter, 1995). In addition, factors such as self-efficacy have also been shown to predict condom use among adolescents, for example, adolescents with higher levels of self-efficacy are more likely to use condoms (Dilorio, et al., 2001). Clearly, there is a wide range of factors that influence an adolescent's decision to engage in risky sexual behaviors.

### *Risk Cognitions*

Two of the most prominent theories that have been employed in attempts to integrate a number of these factors are the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (TPB) (Ajzen, 1985, 1991). These theories suggest that the only proximal predictor of a behavior is intention to engage in that specific behavior. Behavioral intentions (BI) are said to be based on the individual's attitudes toward the behavior, and their perceptions of norms about the behavior. Both of these theories, however, have been criticized for failing to take into account other influences on BI such as social cooperation, which is necessary for many risk behaviors including sexual intercourse (Liska, 1984; Eagly & Chaiken, 1993). Furthermore, the TRA is based on the assumption that people make decisions based on the consistent and logical processing of available information (Rise, 1994). Considerable research has supported these criticisms by

demonstrating that people are not always consistently logical and in fact do not process all available information (Tversky & Kahneman, 1974). The TRA and TPB are more effective at predicting rational or appropriate (e.g., healthy) behaviors, than behaviors that are socially undesirable (Beck & Ajzen, 1991), irrational or impulsive (Ingham, Woodcock, & Stenner, 1992), or have a significant affective component (Eiser, Eiser, & Pauwels, 1993). The fact that these theories are not as useful when predicting adolescent health-risk behaviors as they are at predicting adults' healthy behaviors has led to a search for other kinds of models that will help us to understand adolescent risky behavior more accurately.

### *Dual Processing Models*

In an attempt to account for the inconsistencies often observed between logical reasoning and irrational behavior, dual process theories propose that people possess not one, but two information processing systems. The first, the experiential system, is thought to encompass more heuristic based processing such as rapid or stereotypical thinking, prototypes, or holistic responding (Epstein & Pacini, 1999). The experiential system operates on a more passive and preconscious route, which puts very little strain on our cognitive resources. The second, rational system is proposed to reflect more logical and reasoned processing, such as analytical responding, effortful processing, and abstract symbols and concepts. This route of processing involves a far more deliberate and slow process. For example, if a person were given a choice between 1 in 10 odds or 10 in 100 odds of winning, logic would assume that there would be no consistent difference in what people choose because the odds are equal. However, people consistently choose the task with 10

in 100 chances over those with 1 in 10 odds (Epstein & Pacini, 2001). Similar results are also found when 9 in 100 odds are used. Participants often report that even though they might “know better,” they “feel” like they have better chances with 10 in 100 or 9 in 100 odds. This is a good example of the split that is often observed between logic and overt behavior.

These two systems are proposed to be separate entities that work in parallel but are able to interact with each other. Because people often make illogical decisions, the experiential system is proposed to be a major determinant of overt behavior. The rational system is able to influence the experiential system, but because this heuristic style of processing often occurs outside of conscious awareness, people often fail to exert behavioral control over irrational impulses.

#### *Prototype/willingness (P/W) model*

There are obvious circumstances in health in general, and specifically in adolescent sexual risk behaviors, that demonstrate how the experiential system often “wins out” in the decision making battle. Most teens are aware of the dangers of having unprotected sex (Gerrard & Luus, 1995) or having sex with someone with whom they are unfamiliar. Despite this rational knowledge however, these same teens are still getting STDs and unwanted pregnancies. The prototype/willingness (P/W) model of adolescent health risk behavior is a modified dual-processing model that is designed specifically to explain and predict adolescent health behavior. The model maintains that behaviors are not always intentional, but are oftentimes the result of reactions to risk conducive situations (Gibbons & Gerrard, 1995, 1997). Like other dual processing models, the P/W model proposes that there are two pathways

to adolescent risk behavior that involve different types of information processing. The first is the reasoned or intentional pathway and reflects the fact that sometimes teens intend to engage in risk behaviors, such as binge drinking and unprotected sex. This route (referred to as the behavioral intention (BI) route) involves some degree of pre-contemplation, not only of the behavior, but also of the potential outcomes, and reflects a more deliberate processing system. Because of this reasoned approach, BI is more stable and less influenced by outside factors (e.g., social comparison) (Gibbons, Gerrard, & Lane, 2003; Gibbons & Gerrard, 1995).

The second pathway is the social reaction path. This route reflects the fact that although teens may not plan to, or intend to engage in a risky behavior, they do so as a reaction to social circumstances. This idea is captured in the construct of behavioral willingness (BW), which is an openness to risk opportunity that involves less pre-contemplation of the behavior and its consequences (Gibbons, Gerrard, Ouellette, & Burzette, 1998). Because BW is more influenced by outside factors (e.g. context, affect, social comparison) and less stable than BI (Gibbons, et al., 2004; Gibbons et al., 2003; Gibbons & Gerrard, 1995), it has been shown to be especially important for predicting adolescents' risk taking behavior (Gibbons, Gerrard, Blanton, & Russell, 1998).

Given the growing evidence that much social behavior is driven by the experiential processes described by Epstein and Pacini (2001), Bargh (2002), and Gibbons and Gerrard (Gerrard, et al., 2004; Gibbons et. al, 2004), it is not surprising that health researchers have turned to priming techniques that have previously been successful in using subtle or unconscious information to influence behavior.

### *Priming and Dual-Processing*

Priming has traditionally been characterized by cognitive psychologists as the phenomenon of one stimulus facilitating the processing of a subsequent stimulus. Social psychologists however, have conducted priming studies to evaluate how subtle or even subconscious information might mediate the effects of the social environment (Bargh & Chartrand, 1999). For example Herr (1986) showed that priming a participant with examples of others' hostility had a significant influence on that person's evaluations of targets' neutral behavior. More specifically, when participants were primed with exemplars of hostility, they interpreted a target's ambiguous behavior to be more hostile than participants who were not primed with hostility. This suggests that using exemplars or prototypes as priming stimuli can allow researchers to tap into the experiential route of processing, and thus influence judgments. Other studies have replicated these results, indicating that recently activated stereotypic traits are more likely than traits that have not been recently activated, to be used in evaluations of ambiguous behavior. For example, Srull and Wyer (1979, 1980) asked undergraduates to perform a sentence completion task in which the concepts of either hostility or kindness were primed. They were later asked to read a description of a neutral encounter, and then rate the target on several personality traits. Those primed with the concept of hostility rated the neutral encounter as more hostile than those primed with kindness. These results also indicate that our perceptions and judgments of others may be the result of automatic processes within the experiential system.

More recent research has demonstrated that priming a stereotype construct influences attitudes. Kawakami, Dovidio, and Dijksterhuis (2003) have shown that when participants are asked to think about their stereotypes of a particular group, they subsequently held attitudes more similar to the group in question. For example, when participants were asked to think about stereotypic traits of the elderly, they were later more conservative on an attitudes questionnaire than participants who weren't asked to think about the elderly. These results demonstrate that even when participants have no intention of changing their attitudes to be more similar to the group's, thinking in ways that are predominately on the experiential path (e.g. images or prototypes), can inadvertently lead to shifts in attitudes.

Because decisions to engage in sexual intercourse are known to be influenced by various outside factors, and tend to show signs of impulsivity or irrationality, it is reasonable to expect that decisions about sex might be strongly influenced by the experiential system. The existing literature on priming sex related cognitions supports this claim. Recent research investigating sexual and erotic stimuli have suggested that sexual material is evaluated with a different cognitive process than is neutral material. Researchers in this area have labeled what is known as the Sexual Content-Induced Delay (SCID; Spiering, Everaerd & Elzinga, 2002; Geer & Melton, 1997). This phenomenon occurs when participants are primed with erotic or sexual material and then show an increase in reaction times to subsequent erotic material. For example, Spiering, Everaerd and Elzinga (2002) demonstrated that sexual pictures were recognized by participants more slowly when preceded by a different sexual picture than when preceded by a neutral

picture. Additionally, lexical decisions have been shown to be slower when primed by erotic content (Geer & Melton, 1997). Moreover, even when target words are not primed by sexual stimuli, people are slower to make lexical decisions about words that are sexual in nature, than neutral words (Geer & Bellard, 1996). This research seems to contradict the established facilitative priming effects found in other areas. However, upon closer examination these results support a dual processing approach. In the previously discussed studies, all primes were supraliminal (i.e. available to conscious awareness and elaboration). Because primes were consciously accessible to participants, it is possible that the SCID is actually the result of the rational system exerting control over the experiential system. If this were the case, then one would expect subliminal primes to show the typical facilitative effects generally found in priming research. This is exactly what was found when participants were subliminally exposed to either erotic or neutral pictures immediately prior to making identifications about sexual or neutral pictures (Spiering, Everaerd, & Janssen, 2003). When sexual pictures were subliminally preceded by erotic stimuli, participants were quicker to identify the pictures as being sexual than when they were subliminally preceded with a neutral photograph. These results demonstrate the expected semantic priming effects, suggesting that using subliminal priming methods are a useful way to prime sex while overriding the control mechanisms of the rational route. These results also suggest that subliminally priming sex is a useful way to tap into the experiential route, which may be used when making decisions about sex.

Although it appears that priming is useful for examining social attitudes and behaviors, there have been very few studies that have used priming paradigms in relation to health decisions (e.g., Pechmann, 2001; Millar, & Millar, 2000; and Skelton, & Strohmetz, 1990), and even fewer to use priming methods to evaluate risk judgments (Erb, Bioy, & Hilton, 2002). In one health related priming study, participants were given supraliminal verbal primes related to positive alcohol expectancies in order to evaluate if these primes might influence subsequent alcohol consumption (Stein, Goldman, & Del Boca, 2000). As expected, positive outcome expectancy primes did lead to a significant increase in alcohol consumption over neutral primes. Another study (Roehrich, & Goldman, 1995) also used a semantic priming paradigm to prime alcohol outcome expectancy words. Participants were shown a videotape of a neutral setting or a bar scene, and then exposed to either alcohol related positive outcome expectancy or neutral words. Again, participants who were exposed to either type of alcohol prime drank significantly more placebo alcohol than control participants. These studies are examples of how using priming in the health field can help researchers understand what types of information lead to experiential processing. They also suggest that automatic processes, such as experiential processing, can influence health related decisions.

Also of interest in the current study is how priming the concept of sex might influence participants' willingness and intentions to engage in other risk behaviors. This comes from research on Problem Behavior Theory, which is a social learning theory that accounts for the finding that problematic or risky behaviors such as illicit drug use, early sexual activity, and alcohol consumption in adolescence tend to



covary between and within subjects (Jessor & Jessor, 1975, 1977). The research in this area focuses on the various social factors that might lead to these behaviors (e.g., demographics, outcome expectancies, social skills, etc.; Smith, Canter, & Robin, 1989) but says little about the cognitive factors that might contribute to this finding. The present study attempts to take the general co-occurrence of problem behaviors and investigate the cognitive associations among them. Because risky sex and alcohol consumption tend to occur together, it is reasonable to assume that priming sex might lead to a shift in attitudes about alcohol. This finding would be consistent with semantic priming effects found in cognitive research. Abstract concepts and ideas are hypothesized to exist in semantic networks, whereby these concepts or nodes are connected to one another through links (Collins & Quillian, 1969). The differential effects of the primes on subsequent targets are suggested to reveal the differing weights, or strengths of connections between related concepts in a network (Bower, 1996). Therefore, if these risk behaviors are cognitively linked, then priming one risk behavior should activate other risk behaviors. The current research will attempt to examine the association between sex and other risky behaviors by priming the construct sex and examining changes in attitudes towards sex, alcohol, and drug use.

#### *Individual differences*

When examining shifts in decision-making processes, it is important to consider what role individual differences might play. In the current study a measure of erotophobia will be used to examine individual differences in comfort level with erotic or sexual behavior (Rise, Traeen, & Kraft, 1993). Erotophobia is a measure of

individual differences in comfort level with sexual or erotic stimuli (e.g. “I do not personally find that thinking about sexual intercourse is arousing”). The erotophobia scale has reliably produced 4 separate dimensions: erotophilia, unconventional sex, erotophobia, and homo-orientation (Rise et al., 1993). This construct has been shown to moderate judgments of the likelihood of pregnancy, and also the relationship between sexual risk cognitions and behavior (Smith, Eggleston, Gerrard, & Gibbons, 1996; Gerrard & Luus, 1995). Therefore it is expected that erotophobia/erotophilia will moderate the relationship between priming and risk cognitions.

Because many of the health related decisions that adolescents make are social in nature, are made quickly, and involve prototypical and stereotypical thinking, it is important to understand more fully what factors might influence the experiential route of processing. Moreover, it seems that priming paradigms are well suited to do just that. Because presenting stimuli subliminally appears to bypass the control mechanisms of the rational processing system, it is expected that priming methods are ideal for tapping into and influencing people via the experiential system. Thus, the current study attempts to use subliminal visual priming to induce experiential processing and influence sex related decisions. In contrast supraliminal priming is expected to induce rational and controlled processing. Differences in decisions about risky sexual behavior should then be the result of differential priming methods tapping into the two processing routes.

## Present Study

The proposed study will evaluate how priming male college students with words that are sexual in nature might influence their choices regarding risky health behavior. More specifically, participants will be primed with sexually explicit words, either supraliminally or subliminally, and then asked to make a series of decisions regarding risky sexual and substance use behaviors. The design of the study is a 3 prime (supraliminal vs. subliminal vs. neutral) X 2 order (intentions first vs. willingness first) X 2 erotophobia (phobic vs. phillic) factorial.

The following hypotheses will be tested:

- 1) There will be a main effect of measure, such that participants will show more willingness than intentions across risky behaviors.
- 2) A main effect for erotophobia is expected, such that phobics will be less willing and intending than phillics for all risky behaviors. It is also expected that phobics will be slower to answer the questions than phillics.
- 3) A main effect of priming condition is expected on all measures such that those in the subliminal condition will show greater increases in willingness and intentions to engage in all risky behaviors than those in the supraliminal or control conditions. Reaction times are also expected to be faster for those in the subliminal condition than those in the supraliminal or control conditions

The following interactions will be tested:

- 1) The effect of priming will be moderated by order. It is expected that those who answer BW question first will show greater willingness than those

participants who answer BI question first. Because BW taps into the social reaction pathway, it is expected to be greatest when measured before BI.

This is because activating the reasoned path first makes it difficult to activate the social reaction path later.

- 2) A priming by erotophobia interaction is expected. This interaction is expected for two reasons. First, phillics are expected to be less likely to exert cognitive control over sexual stimuli in all conditions, and secondly because subliminal priming is expected to be less likely to exert the control mechanisms of the rational system. As a result it is hypothesized that subliminal priming will have the greatest impact on phillic participants.

## CHAPTER 2. METHODS

### *Participants and Procedure*

College males (N = 183) in introductory-level psychology courses (M age = 20.6 yrs, 92% Caucasian) were recruited as participants. Potential participants completed questionnaires assessing sexual attitudes, sexual history, and intentions and willingness to partake in risky sexual behavior, use marijuana, and drink excessively (See appendix A). All males who completed these baseline measures during mass testing were eligible to participate. Those who were eligible were contacted by phone and asked to participate in a study investigating visual language processing (See appendix B). Each participant earned part of a research requirement for his psychology course for participating. Participants were run individually in a single laboratory session. They were told they were participating in an experiment designed to evaluate language processing skills. The experimenter informed them that they were going to complete a language task and then fill out a brief questionnaire on the computer.

Once in the laboratory, participants were asked to read and sign an informed consent document (See appendix C) and if they agreed, they were led to a private room and seated at a computer screen and keyboard.

### *Priming task*

The experimenter then explained the language task and left the participant alone to complete it. The computer portion of the experiment was conducted using MediaLab® and DirectRT® (Emperisoft, 2004). All participants were asked to view 160 neutral and non-word letter strings and make a lexical decision about each (See

appendix D). Each word was presented on the screen until a decision had been made about the letter string. Immediately following the decision, a string of capital letters appeared for 200 milliseconds. Participants were randomly assigned to two exposure conditions for the target words. One group of participants saw the 40 target words in the same way as the neutral and non-word letter strings, and were asked to make a lexical decision about each. The other group was unaware of the 40 target words on the screen because the letter strings were presented for only 13 milliseconds and they were forward and backward masked by a string of capital letters for 50 and 137 milliseconds respectively. At this speed, participants may have been aware of seeing a flash of the capital letters, but were unable to consciously recall seeing the target words embedded in them. All participants completed 4 blocks of these 40 words. The first block was of three letter words, the second block was of four letter words, the third block was of five letter words, and the fourth block consisted of six letter words.

### *Questionnaire*

After completing the lexical decision task portion of the experiment, the participants were asked to fill out a brief questionnaire that assessed intentions and willingness to partake in risky sexual behavior, risky alcohol consumption, and marijuana consumption (See appendix F). All participants were first asked to respond to an open-ended BW question (See appendix E). After answering the open-ended question they received one of two different questionnaires, which served as the BW vs. BI order manipulation (See Table 1). The first questionnaire asked about intentions to engage in risky sex before asking about willingness,

whereas the second questionnaire asked about willingness before intentions. This manipulation was designed to evaluate any order effects that may moderate the priming effects, for example it is possible that subliminal priming will have the greatest influence on BW when BW is the first question asked. Because BI is reflective of a reasoned approach, it is expected that asking BI first will reduce the subsequent BW because participants have already begun a more thoughtful and deliberative processing. Answering BI first is expected to reduce the likelihood that participants will be able to enter into the more reactive processing to answer BW without being influenced by the previous response to BI.

After answering either BI or BW first, all subsequent questions were the same for both questionnaires. After finishing this questionnaire, participants were then asked a series of questions designed to probe for suspicion and then fully debriefed (See appendix H).

*Table 1.*  
Order of questionnaire items.

	BW-first	BI-first
1.	Open-ended casual sex BW	Open-ended casual sex BW
2.	Casual sex BW	Casual sex BI
3.	Casual sex BI	Casual sex BW
4.	Sex with a steady partner without birth control BW	Sex with a steady partner without birth control BW
5.	Sex with a steady partner BE	Sex with a steady partner BE
6.	Drink alcohol BW	Drink alcohol BW
7.	Drink alcohol BI	Drink alcohol BI
8.	Smoke marijuana BW	Smoke marijuana BW
9.	Smoke marijuana BI	Smoke marijuana BI

Note: Unless otherwise noted, all questions are on likert-type scales.

## Measures

*Past behavior: assessed at mass testing.* Information about previous sexual experiences (e.g., “how many people have you had sexual intercourse with total in your lifetime?”) on a 10-point scale was gathered at pre-testing.

*Erotophobia: assessed at pre-test.* Participants were asked about the extent to which they agreed or disagreed with statements about erotic sexual statements (e.g., “thinking about sexual intercourse is arousing”; “almost all pornographic material is nauseating”) (Rise et al., 1993). Each item was followed by a 7-point Likert-type scale (from 1=strongly disagree; to 7=strongly agree). Scores for all ten items were then averaged to compute a composite erotophobia score for each participant (see Table 2 for Cronbach’s reliabilities of all indices at mass testing and the experimental session). Those scores were then split into thirds, and those who were in the top (phillics) and bottom (phobic) thirds were recruited to participate.

Table 2: Reliabilities for all indices at mass testing and experiment.

	<b>Pre-test</b>	<b>Laboratory</b>
Erotophobia	.86	
BW to have casual sex	.89	.88
BW steady no protection	.74	.81
BW drink alcohol	.92	.92
BI drink excessively	.94	.94
BW marijuana	.98	.99

*Intentions: assessed at pre-test and experimental session.* Participants were asked to rate on a 7-point scale (from 1= definitely will not; to 7= definitely will) to what degree they intended to engage in risky sexual behaviors in the next 6 months (e.g., have sex with a casual partner). They were also asked to rate their intentions to partake in risky alcohol related behaviors (e.g., go out drinking with the intention of getting drunk; drive after drinking more than 4 drinks) and about marijuana



consumption (e.g., use marijuana in the next 6 months) on the same 7-point scale. BI to drink, and BI to drink excessively were combined into a single index.

*Willingness (scaled): assessed at pre-testing and experimental session.* In order to assess behavioral willingness, participants were asked to read a series of hypothetical situations about sex, alcohol, and marijuana (e.g., they meet an attractive person at a party who wants the participant to go home with them; are at a party and are starting to feel they've had enough to drink). Participants were then asked to rate how willing they would be to do each of several risky sexual behaviors ("stay at her apartment but don't have sex"; "have oral sex"; "stay at her apartment and have sex") and several risky alcohol and marijuana related behaviors (e.g., "stay and continue to drink"; "smoke a little"; "smoke enough to get high"), each on a 7-point scale (from 1= not at all willing; to 7= very willing). Responses to these questions were then aggregated into an index by taking the sum of the individual items for that particular risk behavior (i.e., casual sex, smoking, marijuana).

*Willingness (open-ended): assessed at experimental session only.* In order to assess behavioral willingness to have casual sex, participants were asked an open-ended casual sex BW question before answering any of the scaled questionnaire items. This question asked participants to imagine that they have attended a party and have met an attractive woman, and are having a good time talking to her when the party ends. She seems interested in continuing to talk with the participant and he feels the same way. Participants are asked to write their response to the following question, "what all would you be willing to do in this situation"? Responses were coded on a 4-point scale from 1= no risk (e.g., participant not willing to do anything

physical), 2= minimal risk (e.g., kiss or make out only), 3=some risk (e.g., oral sex) to 4=very risky (e.g., willing to have intercourse). Two researchers coded the risk level of the open ended responses independently (interrater reliability = .92), and the two ratings were averaged into one score.

*Response Time: experimental session only.* Response times in milliseconds were collected for all lexical decisions, and for all questionnaire items. Each response time measure or index was calculated by summing the individual response times from the same items that made the original questionnaire items. For example, the response time for BW to have casual sex was computed by summing the response times from the two individual items that asked participants' willingness to have intercourse and oral sex.

## CHAPTER 3. RESULTS

### *Randomization checks*

Prior to testing the hypotheses a one-way (erotophobia: phobic vs. phillic) ANOVA was conducted on priming condition to check for random assignment to condition. There was not a significant difference of erotophobia by priming group ( $F(2, 180) = 2.22, p > .10$ ). Also, all BI and BW measures at mass testing were entered into one-way ANOVAs by priming condition. There were no main effects of priming group on any BI or BW measure at mass testing (all  $ps > .30$ ). Thus it can be concluded that random assignment to the priming groups was achieved. In addition, there were no differences in relationship/marital status between the two erotophobia groups ( $F(1, 181) = .48, p > .40$ ) which is not surprising given the demographic of the sample (i.e., entry level college males). As expected, phillics ( $M = 2.13, SD = 2.29$ ) did have significantly more lifetime sexual partners than phobics ( $M = .97, SD = 1.66; F(1, 179) = 14.62, p < .01$ ).

### *Priming Groups*

The results presented compare all three priming groups. Additional analyses were conducted by combining the two priming groups and comparing against the control group. This did not systematically alter the findings, so the three separate groups were maintained as outlined in the hypotheses for this paper.

### *Effects of Measures*

It was proposed that there would be a main effect of measure, such that participants would show significantly greater increases in willingness than intentions across risky behaviors and across time. A series of 2 (erotophobia) X 3 (priming

group) X 2 (measure; BI vs. BW) repeated measures ANOVAs were used to test this hypothesis. Results indicated that there was not a significant main effect of measure on the casual sex, risky drinking, or marijuana use items. Furthermore, there was not a consistent pattern of significant interactions involving measures. Thus, all following analyses examine these measures separately.

#### *Order effects*

It was hypothesized that participants who answered the scaled BW to have casual sex item first would show significantly greater willingness than those who answered BI first. To test this hypothesis a one way (questionnaire: BI first vs. BW first) ANCOVA was conducted on BW as a function of when it was answered [the open-ended BW response as the covariate in this analysis, because all participants answered the open-ended BW question before any of the questionnaire items]. Results indicated that there was a significant main effect of order on participants' BW such that BW was significantly higher when it was answered first ( $F(1, 173) = 3.89, p = .05$ ). Further ANCOVAs (again, with the open-ended BW response as the covariate) were conducted entering in the other variables of interest (i.e. questionnaire group, erotophobia, and priming group) as IVs. These analyses revealed that the effect of question order was no longer significant ( $F(1, 167) = 3.50, p = .06$ ) and there were no significant interactions with order (all  $ps > .50$ ). These analyses were replicated for BI. There were no significant main effects or interactions with questionnaire order on BI (all  $ps > .20$ ). As a result, all subsequent analyses were collapsed across order of BI and BW.

#### *Open ended BW to have casual sex*

A 3 (priming group) X 2 (erotophobia) ANOVA was conducted on the open ended BW item. As expected, there was a significant main effect of erotophobia with phillics ( $M = 2.42$ ,  $SD = 1.22$ ) reporting more willingness than phobics ( $M = 1.81$ ,  $SD = 1.05$ ;  $F(1, 170) = 11.78$ ,  $p < .01$ ). There was not a significant main effect of priming group nor was there a significant erotophobia by priming group interaction ( $ps > .70$ ).

### *Scaled Sexual Risk Items*

For all sexual risk items, it was hypothesized that there would be a main effect of priming condition, a main effect of erotophobia, and interactions between these measures across time. To test these hypotheses, a series of 2 (erotophobia vs. erotophilia) X 3 (prime group) X 2 time (pre-test vs. experimental session) repeated measures ANOVAs were performed (See Table 3 for example ANOVA table for the BW to casual sex item). The dependent variable of interest is noted in the underlined sub-headings. It should also be noted that all responses to the scaled questionnaire items were standardized due to different response scales that were used in the mass testing session and the experimental session

Table 3. BW to have casual sex ANOVA table.

Source	df	ss	ms	F	p-value
Erot	1	347.0	347	82.01	.000
Prime	2	.1	.05	.01	.989
Prime X Erot	2	6.96	3.48	.82	.441
Between ss error	175	740.86	4.23		
Time	1	.05	.05	.05	.815
Erot X time	2	10.21	10.21	10.38	.002
Prime X time	1	.96	.48	.49	.615
Erot X Prime X time	2	.62	.31	.31	.732
Within ss Error	175	172	.98		

### BW to have casual sex

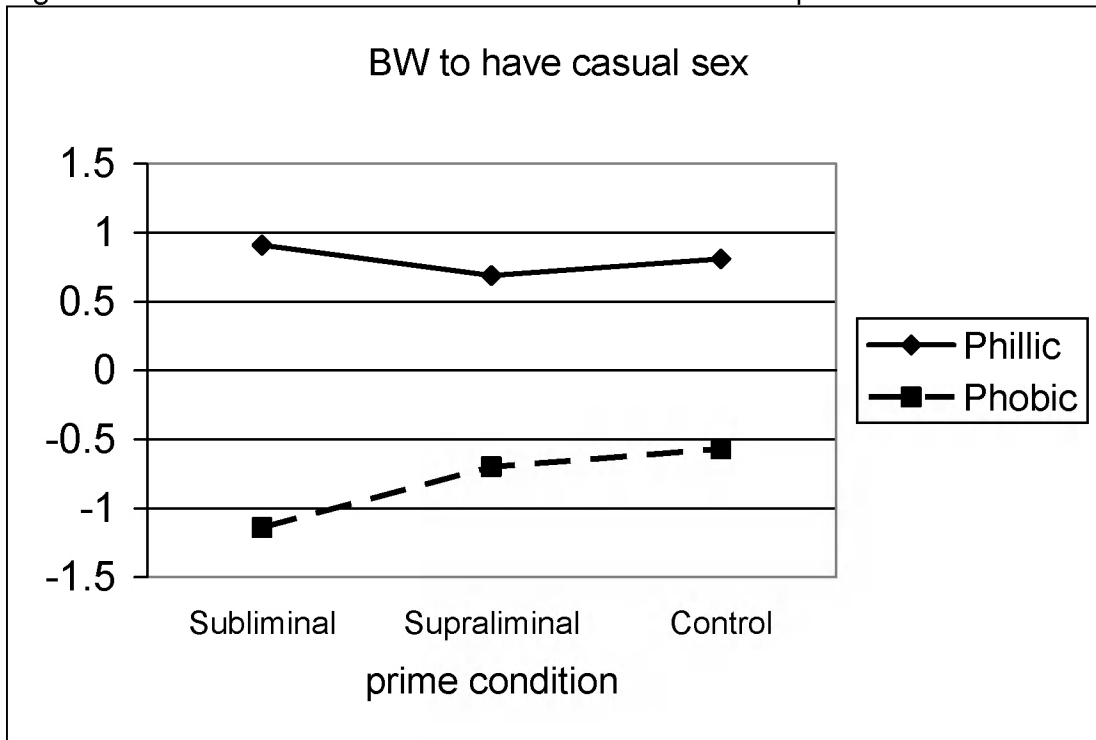
As expected, between subjects tests revealed a main effect of erotophobia, in that phobics ( $M = -1.24$ ,  $SD = 1.74$ ) reported significantly less willingness than phillics ( $M = 1.11$ ,  $SD = 1.24$ ) ( $F(1, 175) = 82.01$ ,  $p < .001$ ). Also as expected, there was no main effect of priming, nor was there an erotophobia by priming interaction ( $ps > .45$ ) at time 1.

Within-subject tests involving time revealed that there was not a main effect of time ( $F(1, 175) = .05$ ,  $p > .8$ ). There was a significant erotophobia by time interaction, however, such that phillics decreased their willingness to have casual sex over time (T1  $M = 1.11$ , T2  $M = .80$ ) while phobics increased their willingness (T1  $M = -1.24$ , T2  $M = -.91$ ) ( $F(1, 175) = 10.38$ ,  $p < .05$ ). This interaction likely reflects regression to the mean caused by selecting participants at the extreme ends of the erotophobia scale. Contrary to expectation, however, there was not a significant priming by time or an erotophobia by priming by time interaction ( $ps > .60$ ). (See Table 4 for sample sizes per cell, standardized means and standard deviations for BW to have casual sex; See Figure 1 for a graphic representation of these results).

Table 4. Detailed descriptive statistics for BW to have casual sex at experiment.

	Subliminal	Supraliminal	Control
BW casual sex	-.28 (2.0) N=69	.12 (1.9) N=61	.21 (1.8) N=53
phillic	.91 (1.79) N=29	.69 (1.72) N=36	.81 (1.47) N=30
phobic	-1.14 (1.68) N=40	-.70 (1.79) N=25	-.57 (1.90) N=23

Figure 1. Plot of means for BW to have casual sex at experiment.



Between-subjects effects revealed that there was a main effect of erotophobia on BI to have casual sex ( $F(1, 175) = 58.70, p < .001$ ). As expected, phillics reported higher BI ( $M = .49, SD = .95$ ) than did phobics ( $M = -.55, SD = .74$ ). Also, similar to the BW measure, there was not a main effect of priming, or priming by erotophobia interaction at time 1 ( $ps > .90$ ; See Table 5 for descriptive statistics of *all* measures following priming).

Next, within-subject effects involving time were examined. There was not a significant main effect of time on BI to have casual sex ( $F(1, 175) = .04, p > .80$ ). There was however, a significant erotophobia by time interaction ( $F(1, 175) = 4.46, p < .04$ ). This interaction revealed that phillics' BI (T1  $M = .49$ , T2  $M = .37$ ) decreased over time while phobics' BI increased over time (T1  $M = -.55$ , T2  $M = -.41$ ). This

interaction likely represents regression to the mean across time. No significant interactions involving priming condition were found ( $ps > .50$ ).

Table 5. Detailed descriptive statistics for BW to have casual sex at experiment. BI to have casual sex

	Subliminal N=69	Supraliminal N=61	Control N=53
BW casual sex (n=183)	-.28 (2.0)	.12 (1.9)	.21 (1.8)
Phillic (n=95)	.91 (1.79)	.69 (1.72)	.81 (1.47)
Phobic (n=88)	-1.14 (1.68)	-.70 (1.79)	-.57 (1.90)
BI casual sex	-.10 (1.04)	.11 (.99)	.01 (.96)
phillic	.33 (1.07)	.46 (.98)	.31 (.96)
phobic	-.42 (.90)	-.40 (.78)	-.38 (.82)
BW steady partner no protection	-.08 (1.79)	.11 (1.74)	-.02 (2.0)
phillic	.69 (2.13)	.05 (1.77)	.54 (2.25)
phobic	-.64 (1.26)	.19 (1.71)	-.75 (1.4)
BE sex steady partner	-.05 (1.0)	-.07 (.96)	.15 (1.0)
phillic	.30 (.89)	.20 (.80)	.37 (.96)
phobic	-.32 (1.03)	-.45 (1.04)	-.14 (1.07)
BW drink excessively	-.27 (1.78)	.04 (2.0)	.30 (2.0)
phillic	.31 (1.52)	.43 (2.05)	1.29 (1.52)
phobic	-.68 (1.85)	-.52 (1.8)	-.99 (1.86)
BI drink excessively	-.11 (1.91)	-.11 (1.91)	.18 (1.9)
phillic	.78 (1.35)	.46 (1.88)	.88 (1.22)
phobic	-.75 (2.01)	-.74 (2.03)	-.73 (2.28)
BI smoke marijuana	-.06 (1.0)	-.06 (1.0)	.12 (1.0)
phillic	.33 (1.17)	.00 (.97)	.38 (1.16)
phobic	-.34 (.76)	-.10 (.96)	-.23 (.76)
BW smoke marijuana	-.21 (1.9)	-.21 (1.9)	.36 (2.1)
phillic	.53 (2.26)	.00 (20.3)	.99 (2.29)
phobic	-.75 (1.45)	-.18 (1.97)	-.45 (1.37)

BW to have sex with a steady partner without birth control

For the BW to have sex with a steady partner without birth control question, there was again a significant main effect of erotophobia ( $F(1, 176) = 12.61, p < .001$ ) with phobics ( $M = -.48, SD = 1.46$ ) being less willing than the phillics ( $M = .45, SD = 1.93$ ) at baseline. There was not a significant effect of priming group or a significant priming group by erotophobia interaction ( $ps > .09$ ).



Within-subjects tests revealed that there was not a main effect of time on BW to have sex with a steady partner without birth control ( $F(1, 176) = .02, p > .90$ ) nor was there a significant erotophobia by time interaction ( $F(1, 176) = .05, p > .80$ ). There was, however, a marginally significant priming by time interaction ( $F(2, 176) = 2.56, p = .08$ ). This interaction revealed that while participants' scores in the supraliminal condition decreased over time, participants' scores in the subliminal and control conditions increased over time. Finally, the erotophobia by priming by time interaction was not significant ( $F(2, 176) = .81, p > .40$ ).

BE to have sex with a steady partner

Following the same pattern as previous results, there was a significant main effect of erotophobia on BE to have sex with a steady partner at time 1 ( $F(1, 176) = 13.87, p < .001$ ) with phobics ( $M = -.29, SD = 1.11$ ) reporting lower BE than phillics ( $M = .26, SD = .81$ ). There was not a significant main effect of priming at time 1, nor was there a significant erotophobia by priming interaction ( $ps > .30$ ).

Within-subject analyses involving time revealed that for BE to have sex with a steady partner, there was not a significant main effect of time, nor were the erotophobia by time, priming by time, or the erotophobia by priming by time interactions significant ( $ps > .50$ ).

### *Substance Use Items*

For all substance use items, it was hypothesized that there would be a main effect of priming condition, a main effect of erotophobia, and interactions between these factors across time. To test these hypotheses, a series of 2 (erotophobia vs. erotophillia) X 3 (prime group) X 2 time (pre-test vs. experimental session) repeated

measures ANOVAs were performed. The dependent variable of interest is noted in the underlined sub-headings.

#### BW to drink alcohol

Between-subjects effects revealed that there was a significant main effect of erotophobia on BW to drink alcohol ( $F(1, 176) = 37.40, p < .001$ ) with phillics ( $M = .76, SD = 1.65$ ) being more willing to drink than phobics ( $M = -.83, SD = 1.85$ ). As expected, there was not a significant main effect of priming nor was there a significant erotophobia by priming interaction at time 1 ( $ps > .20$ ).

For BW to drink alcohol, within-subjects analyses revealed that there was not a main effect of time, nor were any of the interactions involving time significant (all  $ps > .20$ ).

#### BI to drink alcohol

Following the same pattern as previous results, there was a significant main effect of erotophobia on T1 BI to drink alcohol ( $F(1, 176) = 36.56, p < .001$ ) with phillics ( $M = .80, SD = 1.48$ ) being more willing to drink than phobics ( $M = -.87, SD = 2.01$ ). As with BW to drink alcohol, there was not a significant main effect of time on BI ( $F(1, 176) = .01, p > .90$ ), nor were any of the interactions involving time significant (all  $ps > .20$ ).

#### BW to smoke marijuana

At T1, there was a significant main effect of erotophobia on BW to smoke marijuana ( $F(1, 176) = 16.01, p < .001$ ) with phillics ( $M = .59, SD = 2.18$ ) being more willing than phobics ( $M = -.64, SD = 1.51$ ). Within-subjects effects involving time revealed that there was not a significant main effect of time, nor were the

erotophobia by time, priming by time, or the erotophobia by priming by time interactions significant (all  $ps > .10$ ).

#### BI to smoke marijuana

Between-subjects effects at T1 revealed that there was a significant main effect of erotophobia with phillics ( $M = .28$ ,  $SD = 1.11$ ) reporting higher BI than phobics ( $M = -.30$ ,  $SD = .76$ ), ( $F(1, 176) = 13.76$ ,  $p < .001$ ). Furthermore, none of the within-subjects effects involving time was significant (all  $ps > .10$ ).

#### *Response times*

It was hypothesized that response times for the questionnaire items would differ by priming group, such that those who were subliminally primed would respond more quickly than those in the supraliminal group. Participants in the control group were expected to fall between the other groups. To test this hypothesis, a series of 3 (priming group) X 2 (erotophobia) ANOVAs were conducted on participant's response times for each DV.

Because the response times had a skewed distribution, they were transformed. For each individual item, response times that fell outside of the mean plus or minus one standard deviation were set equal to that cutoff point.<sup>1</sup>

#### Sexual Risk Items

First, a 3 (priming condition) X 2 (erotophobia) ANOVA was conducted for BW and BI to have casual sex. There were no significant main effects of erotophobia, or priming group, or an erotophobia by group interaction for either BW or BI ( $ps > .11$ ). Next, this analysis was conducted on the response time for BI to have sex with a steady partner. There was a significant main effect of priming group on the BI to

have sex with a steady partner response time ( $F(2, 177) = 3.21, p < .05$ ). Follow up t-tests revealed that there was not a significant difference between the supraliminal and control groups ( $t = -1.16, p > .20$ ), nor a significant difference between the subliminal and supraliminal groups ( $t = -1.45, p > .10$ ). There was, however, a significant difference between the subliminal and the control groups ( $t = -2.72, p < .05$ ; see Table 6).

Table 6. Response times for BI to have sex with a steady partner.

	Mean response time (in seconds)	
	<i>M</i>	<i>SD</i>
Subliminal (N=69)	5.1*	1.5
Supraliminal (N=61)	5.5	1.9
Control (N=53)	5.9*	1.9

Note: An asterisk denotes a significant difference between groups.

Finally, this ANOVA was repeated on the response time for the BW to have sex with a steady partner without birth control item, and there were no significant main effects of priming group, or erotophobia, or a significant priming by erotophobia interaction ( $ps > .33$ ).

#### Alcohol Items

Next, response time for the willingness to drink excessively item was examined. This analysis revealed a significant main effect of erotophobia, such that phobics responded more slowly ( $M = 5.84, SD = 1.91$ ) than did phillics ( $M = 5.22, SD=2.19$ ) ( $F(1, 177) = 5.21, p < .05$ ). There was not a significant main effect of priming group or a significant erotophobia by priming group interaction ( $ps > .33$ ).

Similar results were obtained for the response time for BI to drink alcohol. Again, there was a significant main effect of erotophobia; phobic participants ( $M = 7.93$ ,  $SD = 2.24$ ) were slower to respond than phillic participants ( $M = 6.65$ ,  $SD = 2.0$ )  $F(1, 177) = 15.19$ ,  $p < .01$ ). This suggests that phobics were spending more time thinking about their response to the BI to drink alcohol item. There was not a main effect of priming group nor was there a significant erotophobia by priming group interaction for BI to drink alcohol ( $ps > .50$ ).

### Marijuana Items

For the response time for BW to use marijuana, there was not a significant main effect of erotophobia, nor was there a significant erotophobia by group interaction ( $ps > .20$ ). There was, however, a significant main effect of priming group ( $F(2, 177) = 3.47$ ,  $p < .05$ ). Follow up t-tests revealed that there was neither a significant difference between the subliminal and supraliminal groups ( $t = 1.66$ ,  $p = .10$ ), nor was there a difference between the subliminal and control groups ( $t = -1.12$ ,  $p > .20$ ; see Table 7). There was, however, a significant difference between the supraliminal and the control groups ( $t = 2.46$ ,  $p < .05$ ). Finally, the BI to smoke marijuana response time was entered into the ANOVA. This analysis revealed that there were no significant main effects of erotophobia, or priming group, or a significant erotophobia by group interaction ( $ps > .10$ ).

Table 7. Response times for BW to use marijuana.

	Mean response time (in seconds) BW to use marijuana	
	<i>M</i>	<i>SD</i>
Subliminal (N=69)	5.1	1.2
Supraliminal (N=61)	4.7*	1.3
Control (N=53)	5.4*	1.5

Note: An asterisk denotes a significant difference between groups.

## CHAPTER 4. DISCUSSION

In general, the hypothesized effects of priming on health decisions were not supported in the present study. Previously, researchers have been successful in using similar methods to demonstrate priming effects. For example, Spiering and colleagues have used the subliminal presentation of erotic pictures to facilitate the recognition of subsequently presented erotic stimuli, thereby demonstrating semantic priming effects (Spiering, Everaerd, & Janssen, 2003). There have not, however, been any studies that have used these or other methods to influence *decisions* about sexual behaviors. This study was the first attempt to use semantic priming of the concept of sex to influence the later sexual health risk decisions of adolescents.

Overall, there were no main effects of priming on any health decisions, nor were any of the interactions involving priming significant. It was hypothesized that priming the construct of sex in a lexical decision task would significantly increase the intentions and (more so) willingness of participants to engage in risky sexual behaviors. It appears, however, that priming in this study did not influence the health risk decisions of adolescent males.

### *Erotophobia*

There are several possible explanations for this failure to find a priming effect. First, as hypothesized, there was a significant main effect of erotophobia on all measures. Phobics were significantly less willing and intending to participate in all risk behaviors. Erotophobia did not, however, significantly interact with priming. Initially, participants were selected to participate in this study who fell at the extreme

ends of the erotophobia continuum. This was done because it was thought that shifts in attitudes due to priming would be more apparent for those at the extreme ends of the erotophobia continuum than for those with more moderate sexual attitudes. However, it is possible that selecting people whose attitudes are extreme limits the degree to which those beliefs can be influenced. This may be particularly true given the sensitive nature of sexual attitudes. It seems that selecting participants whose attitudes were extreme may have limited the degree to which they could be influenced in the laboratory setting. This may be especially true because priming effects are typically small in magnitude. In a comprehensive review of the literature, meta-analyses revealed most priming studies yield small effect sizes (Neely, 1991). Thus, selecting participants with difficult to change and extreme attitudes, in combination with the small effects typically generated by priming, may be responsible for the lack of significant effects. It is possible that by selecting participants with more moderate sexual attitudes, the priming manipulation may have been more effective.

*obtrusive vs. unobtrusive DV*

The implicit nature of priming is at the core of the second possible reason for the current null findings. Many researchers have found robust priming effects on overt behavior, but only when that behavior was measured without participants' awareness. For example, Bargh and colleagues (Bargh, Chen, & Burrows, 1996) demonstrated that participants who were primed with the construct of the elderly subsequently walked more slowly than participants who were not primed. This demonstration is powerful because the participants were not aware that their walking



speeds were being measured, or that they were even still participating in the study. Other researchers (e.g., Strahan, Spencer, & Zanna, 2005) have also shown that subliminal priming can influence overt behavior when participants are unaware their behavior is being measured. For example, Strahan et al. primed participants with thirst related words, and those participants subsequently drank more liquid than participants did who were given neutral primes. Because the DV in this study was collected without the participants' awareness (they thought it was a taste test) it is possible the effects of the prime were stronger. It is unlikely they would have found such robust effects if participants had simply been asked to rate their thirst or to estimate how many milliliters of liquid they would consume if given a beverage. Thus, it is possible that the simple act of asking participants to think about their willingness and intentions and offer an overt response, interfered with the implicit priming paradigm or any priming effects that may have been present. This may also explain why there were no differences between measures. It was hypothesized that BW would be more influenced by priming than BI would, but this effect was not found. Again, it is possible that the implicit effects of priming were overpowered by the rational system when participants were asked to think about their responses to the questionnaire items. This issue is not a simple one to resolve when studying health risk behavior. Ethics prevent researchers from using implicit or observational methods, especially when studying sexual behaviors or illicit drug use.

*Stimuli*

The priming stimuli itself may be responsible for the null findings. The words that were used to prime the construct of sex were words that were explicitly related to the act of sex. Priming the construct of sex is not equivalent to priming sex as a goal state or to priming the positive expectancies associated with engaging in sex. Researchers that have been successful in using subliminal priming techniques have demonstrated that subliminal priming is effective in changing behavior only when the participant has some pre-existing motivation to engage in that behavior. For example, in the thirst studies (Strahan et al., 2005), participants who were subliminally primed with the construct of thirst drank significantly more liquid if they were also made thirsty by eating a dry cookie before being primed. Strahan and colleagues concluded that subliminal priming alone is not enough to influence overt behavior; rather, subliminal priming must coincide with a pre-existing motivation. It was assumed for the present study that college age males are generally somewhat sexually motivated. It is possible however, that this was overestimated. The influence of the laboratory context may not have been thoroughly considered. Demand characteristics and social desirability often influence people's responses to sensitive items in the laboratory. Thus, it is possible that the participants' BI and BW were not influenced by the subliminal primes because they were not sufficiently motivated toward that particular behavior in the laboratory context.

The priming stimuli may be to blame for yet another reason. As previously stated, the words that were used as priming stimuli were clearly related to the construct of sex. Because of their blatant association with sex, it is possible that

some people were offended or turned off by words they perceived as vulgar and offensive rather than enticing or arousing. So, even if participants were semantically primed with the construct of sex, the words may have been offensive enough to induce a state of reactance and thereby eliminate the possibility of successfully priming participants toward sexual risk behaviors.

Although the hypothesized effects of priming on health decisions were not supported, there is some indication that priming did occur. Response time analyses indicate that those who were primed responded to some questionnaire items significantly faster than participants in the control condition, but the effects of priming condition were not consistent. For the BI to have sex with a steady partner item, it was the supraliminally primed participants who responded significantly faster than the control participants. For the BW to smoke marijuana item, it was the subliminally primed participants who responded significantly faster. Because of this inconsistency, firm conclusions about the differential effects of subliminal versus supraliminal priming cannot be drawn. What can be concluded, however, is that priming participants with the construct of sex influenced the speed at which subsequent decisions about other health risk behaviors were made.

These effects of priming on response times are encouraging. Many researchers believe that priming effects (especially subliminal priming effects) are only present for a matter of seconds, and cognitive psychologists in particular have been very skeptical of the priming effects found by social psychologists (Bargh, 2006). The questionnaire items in this study were answered minutes after the participants were primed. This suggests that even if the priming effects were too

small to detect with the questionnaire items, they were detectable with response time analyses for a much greater duration than some researchers believe. Thus, these response time effects are consistent with priming effects typically found by social psychology researchers.

### *Erotophobia and Response times*

It was hypothesized that there would be a main effect of erotophobia on response times, but there were no main effects of erotophobia on any of the response time measures. Although these results do not support the specific hypotheses of this study, they are still consistent with a dual-process approach toward priming research. Because one's beliefs about sex may be difficult to change, particularly in a laboratory setting, it is possible that the null effects found on the questionnaire items may be due to the rational system exerting control over the decision making process. Response times, however, are not under the direct control of the rational system. Therefore, it is possible that response times are tapping into the priming effects on the experiential system. Again, this suggests that using DVs that are implicit, or less likely to be controlled by the rational system, may result in more clear and consistent priming effects.

Finally, the null effects on the questionnaire items, and the inconsistent effects on response times found in this study are notable for another reason. The Sexual Content Induced Delay (SCID) that has been found in other studies was not found in this study. Typically, priming is associated with a facilitative effect (i.e. a reduction in response time). Some researchers, however, have found that priming sexual content leads to an increase in response time to subsequent sexual stimuli. It

was hypothesized in the current study that priming would decrease response times. Although those hypotheses weren't consistently supported, there was no evidence of the SCID.

#### *Study limitations and future directions*

There are a number of limitations of this study to consider. The first and primary limitation is methodological. Because participants were primed first and then asked to respond to the DVs, it is not possible to know if participants were ever truly primed, or if the priming effects were simply too brief or too weak to detect with the questionnaire items. Other priming methods expose the participant to the prime and measure the DV *immediately* after the prime. Therefore, future research will need to examine in more detail whether or not these methods are successful in priming the construct of sex. It is possible that this paradigm would be successful if the stimuli or dependent variables were different (i.e. less offensive, unobtrusive). As discussed earlier, researchers will need to explore different implicit measures that might be more successful.

The second limitation is due to the sample. Because participants were only selected from the extreme ends of the erotophobia continuum, it is not possible to know how those with more moderate scores might respond. It is possible that the greatest priming effects could be found with those participants who lie in the middle of the erotophobia continuum, as they may have less rigid attitudes. Also, the sample was limited to males. This was done because it was assumed that males would be more influenced by sexual stimuli, however this assumption may have been inaccurate. Future studies will need to examine how primes influence female

participants as well in order to make broad conclusions about how priming effects health risk.

Future studies will also need to examine how other health behaviors might be influenced by primes. For example, it is possible that priming a less sensitive behavior such as alcohol consumption might be more fruitful. This may also permit using an unobtrusive DV (actual consumption of alcohol in the laboratory).

In conclusion, although there was not clear support for the hypotheses of this study, there remains encouraging evidence that priming may be able influence health risk behavior of adolescents in future studies.

## CHAPTER 5. NOTES PAGE

1. Response time analyses were also attempted with three other transformations; first by deleting outliers (plus or minus one standard deviation from the mean), second by using a log transformation, and third by doing inverse transformations. The results were not systematically altered by using these transformations, therefore the original transformation was maintained for all response time analyses.

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## CHAPTER 7. APPENDICES

## Appendix A

Baseline measures: obtained during Mass testing

**BW – Casual Sex**

Suppose you were at a party and met a man/woman for the first time. You think that he/she is very attractive. At the end of the evening, you go to his/her apartment with him/her. You're feeling as if you might like to have sex with him/her and he/she obviously feels the same way. How willing would you be to do each of the following?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

1. Stay at his/her apartment and have oral sex.
2. Stay at his/her apartment and have sex.
3. Stay at his/her apartment, but don't have sex.
4. Get his/her phone number and go home alone

**Previous Experience**

5. How many people have you had sexual intercourse with total in your lifetime?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>
<b>None</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6-7</b>	<b>8-9</b>	<b>10-11</b>	<b>12 or more</b>

**BI**

6. Do you intend to have sex in the next 6 months with someone you're not exclusively dating?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I</b>			<b>Maybe</b>			<b>I</b>
<b>definitely will not</b>						<b>definitely will</b>

**BE**

7. How likely is it that you will have sex with a *new* partner (someone you have just met or not dated before) in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I</b>			<b>Maybe</b>			<b>I</b>
<b>definitely will not</b>						<b>definitely will</b>



8. How likely is it that you will have sex with a *steady* partner in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
I			<b>Maybe</b>			I
<b>definitely will not</b>						<b>definitely will</b>

### **BW – Steady partner**

Suppose you were alone with your boyfriend/girlfriend and he/she wanted to have sexual intercourse. Neither of you have used or have available a contraceptive method. Under these circumstances, how willing would you be to do each of the following?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

9. Go ahead, but use a method like withdrawing the man's penis before ejaculation.

10. Not have sex.

11. Go ahead and have sex anyway without birth control.

### **BI - Marijuana**

12. Do you intend to use marijuana in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
I			<b>Maybe</b>			I
<b>definitely will not</b>						<b>definitely will</b>

### **BW - Marijuana**

Suppose you were with a group of friends and there was some marijuana you could have if you wanted it. How willing would you be to do each of the following?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

13. Take some of the marijuana and use it.

14. Use enough of the marijuana to get high.

**BI - Drinking**

For the behaviors listed below, please indicate the extent to which you intend to do each one during the next 6 months.

15. Have 4 or more drinks in a single drinking episode.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely</b>			<b>Maybe</b>			<b>Definitely</b>
<b>Not</b>						<b>Yes</b>

16. Go out drinking with the intention of getting drunk.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely</b>			<b>Maybe</b>			<b>Definitely</b>
<b>Not</b>						<b>Yes</b>

17. Drive after drinking (4 or more drinks).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely</b>			<b>Maybe</b>			<b>Definitely</b>
<b>Not</b>						<b>Yes</b>

**BW - Drinking**

Suppose that you are at a party. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a friend you haven't seen for a while starts talking to you and offers to get you another drink. How willing would you be to do each of the following?

18. Stay and have one more drink.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at</b>			<b>Maybe</b>			<b>Very</b>
<b>all</b>						<b>willing</b>
<b>willing</b>						

19. Stay and continue to drink (more than one drink).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at</b>			<b>Maybe</b>			<b>Very</b>
<b>all</b>						<b>willing</b>
<b>willing</b>						

20. Stay, but not drink any more.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at</b>			<b>Maybe</b>			<b>Very</b>
<b>all</b>						<b>willing</b>
<b>willing</b>						

21. Say you need to leave, but tell your friend you will call him/her.

**A**  
**Not at**  
**all**  
**willing**

**B**

**C**

**D**  
**Maybe**

**E**

**F**

**G**  
**Very**  
**willing**

## Appendix A Continued

### Sexual Opinion Survey –obtained during Mass testing

**This is an opinion survey, i.e., there are no right or wrong answers, we are just interested in your honest opinions. Please respond to each item as honestly as you can by filling in the response that best represents your reaction to the statement.**

22. I think it would be very entertaining to look at hard-core pornography.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

23. Pornography is obviously filthy and people should not try to describe it as anything else.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

24. Swimming in the nude with a member of the opposite sex would be an exciting experience.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

25. Masturbation can be an exciting experience.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

26. I do not personally find that thinking about engaging in sexual intercourse is arousing.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

27. Seeing a pornographic movie would be sexually arousing to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

28. The thought of engaging in unusual sex practices is highly arousing.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree



**Appendix B**Calling Script – to recruit participants who participated in mass testing

Hi, my name is \_\_\_\_, and I am calling on behalf of the psychology department at Iowa State University. I received your name from the mass testing session that you participated in earlier this semester and was wondering if you would be interested in volunteering to participate in a research experiment to gain extra credit for your class. (Continue if participant says yes)

In this experiment we are interested in language processing skills. A single session will consist of a computer task and filling out a brief questionnaire. Some of these questions are personal in nature. Participation will last for 50 minutes or less and is worth one research participation credit. Does this sound like something you would be interested in doing? (Continue if participant agrees)

Do you have a pencil and paper?

-Set date and time.

-Location: Lagomarcino W 105

-Experiment name: **Visual language processing**

-Experiment number:

-The researcher conducting the study is Rachel Reimer

-Number to call to reschedule or if questions: 294-8686.

Thank you for your time and we will see you at Lago W105 on (day of week) at (time).

## **Appendix C**

### INFORMED CONSENT DOCUMENT

**Title of Study:** Visual language processing  
**Investigators:** Rachel Reimer, B. S., Meg Gerrard, Ph.D., Rick Gibbons, Ph.D.

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time. You must be 18 to participate in this study, or if you are not yet 18, have written parent or guardian permission to do so.

#### *INTRODUCTION*

The purpose of this study is to gain a better understanding of how we process language information. You are being invited to participate in this study because of your participation in mass testing earlier in the semester.

#### *DESCRIPTION OF PROCEDURES*

If you agree to participate in this study, your participation will last 50 minutes or less. During the study you may expect the following study procedures to be followed. You will be asked to view letter strings on a computer screen and make decisions about them. Some of the words may or may not be graphic in nature. If you are uncomfortable at any time you may skip items or choose to quit at any time. After you have completed the computer task you will be asked to fill out a brief questionnaire.

#### *RISKS*

While participating in this study you may experience the following risks: mild discomfort viewing explicit material. You may also feel discomfort providing personal information. There are no additional risks for participating in this study.

#### *BENEFITS*

If you decide to participate in this study there will be no direct benefit to you. It is hoped that the information gained in this study will benefit society by contributing new information to the existing body of literature.

#### *COSTS AND COMPENSATION*

You will not have any costs from participating in this study. You will receive one research participation credit in fulfillment of psychology course requirements for participating in this study.

#### **PARTICIPANT RIGHTS**

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the

study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

**CONFIDENTIALITY**

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: Participants will be assigned ID numbers so that their names will not appear on data. Data will be stored on a password protected computer in a locked office. Only investigators and research assistants will have access to the data. If the results are published, your identity will remain confidential.

*QUESTIONS OR PROBLEMS*

You are encouraged to ask questions at any time during this study. For further information about the study contact Dr. Meg Gerrard at 294-2119. If you have any questions about the rights of research subjects or research-related injury, please contact the Human Subjects Research Office, 2810 Beardshear Hall, (515) 294-4566; [austingr@iastate.edu](mailto:austingr@iastate.edu) or the Research Compliance Officer, Office of Research Compliance, 2810 Beardshear Hall, (515) 294-3115; [dament@iastate.edu](mailto:dament@iastate.edu)

\*\*\*\*\*

*SUBJECT SIGNATURE*

*Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.*

Subject's Name (printed) \_\_\_\_\_

\_\_\_\_\_  
(Subject's Signature)

\_\_\_\_\_  
(Date)

*INVESTIGATOR STATEMENT*

*I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.*

\_\_\_\_\_  
(Signature of Person Obtaining  
Informed Consent)

\_\_\_\_\_  
(Date)



## Appendix D

	<b>Neutral</b> (All)	<b>Non-words</b> (All)		<b>Sex Related</b> (Priming Conditions Only)	<b>Control Condition</b> (Only)
<b>3-Letter</b>	Bug Now Ask Cut Ice Low Eel Hat Ore Dig	Nup Aqe Cer Fet Deg Hir Kot Lut Vib Zol	Uce Yev Bef Ita Xye Ewi Oit Pye Myt Vit	Sex Pet Cum Wet Hot Box Tit Rub Lay Bed	Win Mop Can Den Fog Get Jet Not Say Ant
<b>4-Letter</b>	Tree Read Door Gasp Jump Mail Rule Torn Wall Fish	Ebre Gute Oxed Ader Hyce Miet Rawt Vize Zune Durn	Fimp Jope Zand Crit Kuft Paxy Trav Xite Birt Huce	Sexy Oral Urge Slut Nude Anal Hump Lube Hard Blow	Ants Both Will Idea Role Next Used Shoe Note Lamp
<b>5-Letter</b>	Heavy Eight Koala Noise Optic Piano Shell Vault World Cross	Broll Erbit Igtel Nushe Quaxy Unrel Yilts Couyl Irls Mishy	Drets Fatch Luwet Olvit Shurl Waber Ashir Gapol Kowts Prect	Naked Booty Horny Spank Screw Strip Kinky Touch Flirt Sucks	Think Basic React Point Often Light First Dream Stuff Maybe
<b>6-Letter</b>	Normal Search Puzzle Effort Answer Drawer Signal Helper Wrench Lawyer	Alborc Cepgad Erstal Grenil Iprast Lotchy Omnisi Quaglu Swadif Wimash	Bemcru Diywuf Feanup Hanwyn Jastir Motarn Pynac Rugzyl Tulwix Zylfot	Sexual Erotic Risqué Arouse Sultry Carnal Breast Vagina Steamy Coitus	Relate Writer Letter Friend Learns Intake Floral Demand Asking Scream

**Appendix E**Open-ended casual sex BW question

Imagine that you went to a party at a friend's house. While you were there you meet your friend's roommate for the first time. You have been talking with her for a while and having a good time when the party seems to be ending. You two are now by yourselves, what all what all would you be willing to do with her?

## Appendix F

### Questionnaire A – Behavioral Intention measured first

1. How likely is it that you will have sex with a *new* partner (someone you have just met or not dated before) in the next 6 months?

A	B	C	D	E	F	G
I			Maybe			I
definitely will not						definitely will

2. How likely is it that you will have sex with a *steady* partner in the next 6 months?

A	B	C	D	E	F	G
I			Maybe			I
definitely will not						definitely will

**Please think carefully about the following situations. We are not implying that you would ever be in these situations, but try to think about how you would respond if you were.**

**First, imagine that you were not in an exclusive dating/sexual relationship. Suppose you were at a party and met a woman for the first time. You think that she is very attractive. At the end of the evening, you go to her apartment with her. You're feeling as if you might like to have sex with her and she obviously feels the same way. How willing would you be to do each of the following?**

3. Stay at her apartment and have oral sex.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

4. Stay at her apartment and have sex.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

5. Stay at her apartment, but don't have sex.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

6. Get her phone number and go home alone.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

**Suppose you were alone with your boyfriend/girlfriend and he/she wanted to have sexual intercourse. Neither of you have used or have available a contraceptive method. Under these circumstances, how willing would you be to do each of the following?**

7. Go ahead, but use a method like withdrawal (withdrawing your penis before ejaculation).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

8. Not have sex.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

9. Go ahead and have sex anyway without birth control.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

10. Do you intend to use marijuana in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I definitely will not</b>			<b>Maybe</b>			<b>I definitely will</b>

Suppose you were with a group of friends and there was some marijuana you could have if you wanted it. How willing would you be to do each of the following?

11. Take some of the marijuana and use it.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Not at all willing			Maybe			Very willing

12. Use enough of the marijuana to get high.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Not at all willing			Maybe			Very willing

For the behaviors listed below, please indicate the extent to which you intend to do each one during the next 6 months.

13. Have 4 or more drinks in a single drinking episode.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Definitely Not			Maybe			Definitely Yes

14. Go out drinking with the intention of getting drunk.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Definitely Not			Maybe			Definitely Yes

15. Drive after drinking (4 or more drinks).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Definitely Not			Maybe			Definitely Yes

Suppose that you are at a party. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a friend you haven't seen for a while starts talking to you and offers to get you another drink. How willing would you be to do each of the following?

16. Stay and have one more drink.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Not at all willing			Maybe			Very willing

17. Stay and continue to drink (more than one drink).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

18. Stay, but not drink any more.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

19. Say you need to leave, but tell your friend you will call him/her.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

## Appendix F Continued

### Questionnaire B – Behavioral Willingness measured first

Please think carefully about the following situations. We are not implying that you would ever be in these situations, but try to think about how you would respond if you were.

First, imagine that you were not in an exclusive dating/sexual relationship. Suppose you were at a party and met a woman for the first time. You think that she is very attractive. At the end of the evening, you go to her apartment with her. You're feeling as if you might like to have sex with her and she obviously feels the same way. How willing would you be to do each of the following?

1. Stay at her apartment and have oral sex.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

2. Stay at her apartment and have sex.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

3. Stay at her apartment, but don't have sex.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

4. Get her phone number and go home alone.

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

Suppose you were alone with your girlfriend and she wanted to have sexual intercourse. Neither of you have used or have available a contraceptive method. Under these circumstances, how willing would you be to do each of the following?

5. Go ahead, but use a method like withdrawal (withdrawing your penis before ejaculation).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

6. Not have sex.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

7. Go ahead and have sex anyway without birth control.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

8. How likely is it that you will have sex with a *new* partner (someone you have just met or not dated before) in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I definitely will not</b>			<b>Maybe</b>			<b>I definitely will</b>

9. How likely is it that you will have sex with a *steady* partner in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I definitely will not</b>			<b>Maybe</b>			<b>I definitely will</b>

10. Do you intend to use marijuana in the next 6 months?

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>I definitely will not</b>			<b>Maybe</b>			<b>I definitely will</b>



Suppose you were with a group of friends and there was some marijuana you could have if you wanted it. How willing would you be to do each of the following?

11. Take some of the marijuana and use it.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

12. Use enough of the marijuana to get high.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

For the behaviors listed below, please indicate the extent to which you intend to do each one during the next 6 months.

13. Have 4 or more drinks in a single drinking episode.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely Not</b>			<b>Maybe</b>			<b>Definitely Yes</b>

14. Go out drinking with the intention of getting drunk.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely Not</b>			<b>Maybe</b>			<b>Definitely Yes</b>

15. Drive after drinking (4 or more drinks).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Definitely Not</b>			<b>Maybe</b>			<b>Definitely Yes</b>

Suppose that you are at a party. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a friend you haven't seen for a while starts talking to you and offers to get you another drink. How willing would you be to do each of the following?

16. Stay and have one more drink.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

17. Stay and continue to drink (more than one drink).

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

18. Stay, but not drink any more.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

19. Say you need to leave, but tell your friend you will call him/her.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
<b>Not at all willing</b>			<b>Maybe</b>			<b>Very willing</b>

## **Appendix H**

### Debriefing – used in subliminal prime condition

#### Debriefing 1

As you read in the beginning, we are interested in how people process language information. More specifically for this study, we are interested in exploring the effects of words that are sexual in nature. This study is part of a larger research program that is interested in risky health behaviors. There are many factors that are known to influence people's decisions about health, and we are interested in exploring how subtle contextual stimuli, such as words in language, might influence these decisions.

You were in one of two conditions for this study. The first group of students made decisions about letter strings, some of which included sexually related words. The other group of participants made decisions about the same list, only without the sexual words. Although the second group did not make decisions about the sexual words, those words were actually flashed on the screen so quickly that they were not consciously aware of seeing them.

The purpose of this procedure was to evaluate what effect non-conscious stimuli might have on conscious decision making processes. For example, it is possible that viewing these words, either consciously or subconsciously, will influence one's intentions to use protection when having sex. We want to reassure you that whatever effects these words might have on your responses to questionnaire items, we expect these effects to be short lived, and they should have no influence on your day to day life.

Do you have questions or comments about what you have just been told?

If you have any questions at a later time, you are encouraged to call Rachel Reimer at 294-8686. You can also contact the supervising professor Meg Gerrard at 294-2119. If you have questions about the rights of research subjects or research-related injury or treatment, please contact the Office of Research Compliance Officer, Diane Ament at 294-3115; [dament@iastate.edu](mailto:dament@iastate.edu); or by mail at 2810 Beardshear Hall.

## **Appendix H Continued**

### Debriefing – used in supraliminally primed condition

#### Debriefing 2

As you read in the beginning, we are interested in how people process language information. More specifically for this study, we are interested in exploring the effects of words that are sexual in nature. This study is part of a larger research program that is interested in risky health behaviors. There are many factors that are known to influence people's decisions about health, and we are interested in exploring how subtle contextual stimuli, such as words in language, might influence these decisions.

You were in one of two conditions for this study. The first group of students made decisions about letter strings, some of which included sexually related words. The other group of participants made decisions about the same list, only without the sexual words.

The purpose of this procedure was to evaluate what effect these subtle stimuli might have on conscious decision making processes. For example, it is possible that viewing these words will influence one's intentions to use protection when having sex. We want to reassure you that whatever effects viewing this stimuli might have on your responses to questionnaire items, we expect these effects to be short lived, and they should have no influence on your day to day life.

Do you have questions or comments about what you have just been told?

If you have any questions at a later time, you are encouraged to call Rachel Reimer at 294-8686. You can also contact the supervising professor Meg Gerrard at 294-2119. If you have questions about the rights of research subjects or research-related injury or treatment, please contact the Office of Research Compliance Officer, Diane Ament at 294-3115; [dament@iastate.edu](mailto:dament@iastate.edu); or by mail at 2810 Beardshear Hall.

## **Appendix H Continued**

### Debriefing – used in control condition

#### Debriefing 3

As you read in the beginning, we are interested in how people process language information. More specifically for this study, we are interested in exploring the effects of words that are sexual in nature. This study is part of a larger research program that is interested in risky health behaviors. There are many factors that are known to influence people's decisions about health, and we are interested in exploring how subtle contextual stimuli, such as words in language, might influence these decisions.

You were in one of two conditions for this study. The first group of students made decisions about letter strings, some of which included sexually related words. The other group of participants, your group, made decisions about the same list, only without the sexual words.

The purpose of this procedure was to evaluate what effect these subtle stimuli might have on conscious decision making processes. For example, it is possible that viewing sexual words will influence one's intentions to use protection when having sex. People in your condition were not exposed to any explicit material because you were in the control condition. That is, the condition that we will use as a comparison for the other group.

Do you have questions or comments about what you have just been told?

If you have any questions at a later time, you are encouraged to call Rachel Reimer at 294-8686. You can also contact the supervising professor Meg Gerrard at 294-2119. If you have questions about the rights of research subjects or research-related injury or treatment, please contact the Office of Research Compliance Officer, Diane Ament at 294-3115; [dament@iastate.edu](mailto:dament@iastate.edu); or by mail at 2810 Beardshear Hall.