Effects of Self-Affirmation And/or Mindfulness Interventions on Undergraduates’ Receptivity to Sexual Health Information

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Effects of Self-Affirmation and/or Mindfulness Interventions on Undergraduates’ Receptivity to Sexual Health Information

Zahra Dabirzadeh

A Thesis in the Field of Clinical Psychology
For the Degree of Master of Liberal Arts in Extension Studies

Harvard University
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Abstract

This study examined the effects of self-affirmation and/or mindfulness interventions on college students’ receptivity to sexual health information. Participants (N = 81) were randomly assigned to one of four groups with differing interventions: (a) control group; (b) self-affirmation intervention; (c) mindfulness intervention; (d) self-affirming x mindful intervention. Following the intervention, participants were presented with high-risk health information in the sexual domain. The major hypothesis was that, relative to the other three groups, those receiving the combined self-affirmation and mindfulness intervention, at the end of the experimental session, would be more likely to endorse positive sexual health-promoting attitudes (e.g., self-report responses about increasing the number of times for routine sexually transmitted infections, or STI, testing) and behaviors (taking educational brochures and free condoms, making an appointment for STI screening). Findings indicated significant differences among groups on three of seven (42.9%) dependent measures (4 attitudinal, 3 behavioral). With respect to attitudes, those in the mindfulness condition report finding the most value in having STI testing within the immediate future. Those in the self-affirmation x mindfulness condition express the strongest intentions to increase the frequency of STI testing and display the highest instance of actually booking appointments for STI testing. In support of the hypothesis, the findings highlight the value of a holistic orientation (assessing attitudes and observing behavior) in changing individuals’ receptivity to considering self-relevant, high-risk information.
Dedication

I dedicate this thesis to my uncle, Ali Shafaei. You inspire me even through your hardships and your recovery and I hope that you find peace in your heart. I also dedicate this work to my parents, my mother, Afsaneh, and my father, Abdollah. Without your courage to immigrate to a new land, your undying dedication to an extremely strong work ethic, and your unfailing support through my ups and downs, I would not be where I am today. I thank you and love you both from the bottom of my heart.
Acknowledgements

I would like to acknowledge my thesis director, Jack Demick, for being so kind, knowledgeable, and encouraging during this process. Professor Demick has been nothing but supportive and I am forever grateful to have been given the opportunity to work with him in this capacity. I would also like to extend thanks to my research advisor, Dr. Dante Spetter, for her presence, teaching, and mentoring during my time at Harvard. Finally, I would also like to acknowledge Professor Ellen Langer for making her laboratory accessible to me, for offering her perspectives, and for helping me navigate the IRB approval process. As a result of these individuals, I have grown considerably as a student of psychology and as a person.
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Chapter I

Introduction

Do self-affirmation and/or mindfulness interventions help individuals accept self-relevant, high-risk information, particularly in the sexual domain? Cognitive dissonance, a theory proposed by Festinger (1957), has attempted to explain why people instinctively do not accept high-risk health information, especially when extremely self-relevant. Resistance to behavior change even when faced with evidence that contradicts a currently held health belief is common, especially when the evidence is most relevant to an individual’s current habits (Ditto, Scepanisky, Munro, Apanovitch, & Lockhart, 1998; Kunda, 1987). In fact, the more at risk the individual, the less persuaded she or he will tend to be and the less likely to change her or his behavior (Harris & Napper, 2005).

The theory behind this phenomenon is that being on the receiving end of self-relevant health information can activate psychological threat and thus be taxing to one’s self-resources, leading one to become defensive (Ditto & Lopez, 1992; Jemmott, Ditto, & Croyle, 1986; Kunda, 1987). Steele’s (1988) self-affirmation theory has proposed that the dissonance is not the cause of logic-like inconsistency (Festinger, 1957) or an inconsistency of the self as self-consistency theorists would argue (Aronson, 1969; Aronson, Cohen, & Nail, 1999) but rather stems from one’s sense of self-integrity being placed in jeopardy. Thus, cognitive strategies have been largely ineffective at changing defensive responses to health information (Weinstein & Klein, 1995). In contrast, motivational strategies have been effective in reducing defensiveness and increasing acceptance of health messages. This body of work is important because, while self-affirmation prior to receiving a health communication has been shown to improve the acceptance of high risk health information, responses vary across individuals (Sweeney & Moyer, 2004).
Thus, other factors need to be considered and one such possible factor is Langer’s (1992, 2000) construct of mindfulness, which has been shown to increase individuals’ wellbeing across a variety of domains.

Thus, the purpose of the present study was to test whether a self-affirmation induction, a mindfulness induction, or an induction combining both self-affirmation and mindfulness would be most efficacious in enabling individuals’ more objective processing of otherwise threatening health information. These differential interventions were assessed, at the end of the experiment, from both participants’ attitudes (intentionality to change high-risk sexual behavior) and actual behavior (e.g., making an appointment for STI testing). Alternative explanations will also be provided including attention to possible confounding, interacting, and correlating variables.

Research Aims and Expectations

First, it was expected that exposure to self-relevant, high-risk health information poses a threat to positive self-regard and that an opportunity to affirm oneself in another domain (self-affirmation induction) would help remedy that threat by enabling other psychological resources to mitigate the perceived risk. This would then allow for more open, less biased processing of health-risk information (e.g., Steele, 1998). Second, given proposed relations between self-affirmation and mindfulness, it was expected that a mindfulness induction would be as effective in reducing psychological threat in relation to high-risk health information as a self-affirmation induction. Third, it was expected that a combined self-affirmation x mindfulness induction would be the most effective in reducing psychological threat and fostering receptivity to health-risk information. This is because both self-affirmation and mindfulness are assumed to increase individuals’ external awareness. These aims and expectations have clear implications for the
development of intervention programs aimed at helping individuals to process self-relevant, high-risk information not only in the domain of sexuality but also in all domains of human functioning and wellbeing (e.g., physical health, psychological or mental health, social health, appropriate identification and interactions with relevant sociocultural group memberships).

**Background**

When individuals seek to maintain a self-image as positive and healthy, they are motivated to restore their self-image when behaviors important to these self-conceptions are linked to disease. Thus, they can be defensive and deny that they are at risk when faced with information that addresses their current health habits and/or beliefs (Sherman, Nelson, & Steele, 2000). In an experimental demonstration of this, Janis and Terwilliger (1962) presented adult participants between the ages of 18-55 years with factual information regarding the health dangers of smoking. Next, participants were asked to put on headphones playing white noise to obstruct hearing their own voices. Finally, they were asked to verbalize the spontaneous associations that came to mind when they imagined themselves smoking. Results showed that, relative to light smokers, those who partake more heavily in the harmful health habit in question, in this case smoking, are more apt to reject information linking smoking to cancer. In a related manner, Kunda (1987) examined whether people are less likely to believe scientific evidence if it links a behavior they perform or an attribute they possess to a negative outcome. In an experiment, college students read an article about caffeine use causing an increased risk of fibrocystic disease. They then answered a questionnaire asking them to recall parts of the article among which the key dependent measures were embedded (e.g., asking them to judge their probability of developing fibrocystic disease in the next 15 years). Results indicated that heavy
female caffeine consumers report being less convinced of the link between caffeine and fibrocystic disease compared to light caffeine consumers. There were no differences between the males who were heavy or light caffeine drinkers presumably because of their much lower breast cancer risk.

These results were replicated by Liberman and Chaiken (1992), who assigned female undergraduate participants to read a fictitious medical article confirming the link between drinking coffee and developing fibrocystic disease. Participants then answered a series of questionnaires assessing their beliefs, intentions, and recall regarding the information in the article. Findings indicated that female coffee drinkers are less accepting of health information relating coffee drinking to fibrocystic disease than female non-coffee drinkers. Further, the high-relevance participants show a biased systematic processing of the health information, meaning that they are more critical of aspects of the article than low-relevance participants.

**Cognitive dissonance.** Cognitive dissonance has been identified as one of the mechanisms responsible for the defensive processing of health information. Cognitive strategies used to mitigate defensive responses have been examined and have found to be “largely ineffective.” Motivational strategies, on the other hand, have been effective at reducing defensiveness, leading to increased acceptance of health messages (Sherman, Nelson, & Steele, 2000). For example, Weinstein and Klein (1995) conducted several multi-method studies using cognitive strategies to reduce optimistic biases with respect to the prevalence of a variety of health problems and hazards. Findings revealed that individual biases regarding personal risk perception of developing a health problem or dealing with a health hazard are not reduced in any of the studies that use cognitive rather than motivational strategies. The cognitive dissonance resulting from individuals’ actions being inconsistent with their beliefs
can be motivating for them to engage in health promoting behaviors. For example, Sherman, Nelson, and Steele (2000) conducted a study in which sexually active college students were placed in one of two conditions: the affirmation condition or the no-affirmation (control) condition. All participants ranked a list of 11 values (including, e.g., physical attractiveness, relationships, artistic skills) in order of personal importance. Then, participants were randomly assigned to one of the conditions. Participants in the affirmation condition wrote a short essay for 5 minutes about why their top ranked value is important to them and a time when it was particularly important. Participants in the no-affirmation condition wrote an essay for five minutes about their ninth most important value about why it might be important to the average student. Participants subsequently watched an AIDS educational video entitled “People Like Us.” The video was 12 minutes long and included six people living with AIDS, who shared their story about how they contracted the disease and how their life experience changed because of it. The dependent measures included AIDS-preventive behaviors (e.g., buying condoms, obtaining educational brochures), assessments of the video, and perceptions of their own personal risk for AIDS.

After viewing the video, participants completed questionnaires rating (on a 9-point scale) how similar their own sexual experiences were to the experiences depicted in the video, how accurately they thought the video represented the probability of HIV infection for people such as themselves, and finally how at risk for HIV they considered themselves to be. Next, the researchers paid the subjects for completing the study and told them that the health center donated condoms and educational brochures for study participants. Subjects could buy condoms for 10 cents each and take as many brochures as they wanted. When the participants were done with taking brochures or purchasing condoms, the researchers returned to count the number of
condoms and brochures remaining. Results indicated that participants who self-affirmed have increased perceptions of personal risk for HIV and engage in AIDS preventive behaviors such as purchasing condoms and taking brochures. Female self-affirmed participants view themselves as more similar to the people in the video with respect to risky behavior, and participants overall saw themselves as more at risk for HIV. According to the authors, the study “shows that grasping the motivational factors which lead to defensiveness can lead to positive health behaviors” (p. 2).

Additionally, the study presented threatening information to the participants—that they were at risk for HIV—which would “presumably put them in a worse mood, suggesting that affirmation results cannot be accounted for by mood” (p. 10).

**Psychological threat.** Positive health behavior change is often challenging because of the barriers, both physical and psychological, that can impede progress. One common denominator that acts as a barrier to behavior change is the perception of self-relevant health messages as alarming to one’s self-worth (Falk et al., 2015). This psychological barrier is the perception of psychological threat. Psychological threat is defined as an individual’s feeling of a sense of insecurity apropos an imminent harm, trouble, or danger (American Heritage Dictionary as cited in Sheldon & Kasser, 2008, p. 38). It can manifest itself in a myriad of ways such as a threat to self-esteem, social inclusion, and/or overreliance on order and control. This barrier has made it difficult to influence at-risk individuals to ameliorate their health habits and thus prevent the onset of physical and psychological disease.

In fact, research has shown that individuals with the highest risk tend to be the most defensive and resistant to self-relevant health messages (Falk et al., 2015). The perception of psychological threat motivates the individual to reaffirm the self when it senses a threat (Rutjens, van der Pligt, & van Harreveld, 2012). To combat against psychological threats, defensive
adaptations are used to restore self-integrity through cognitive and/or behavioral adaptations. In restoring self-integrity, the individual is not necessarily evaluating every threat in a self-aggrandizing way but rather is concerned with sustaining an overarching narrative of the self’s adequacy (Cohen & Sherman, 2014). Social psychological interventions, such as the self-affirmation intervention, help individuals to access their personal narratives and appraisal of themselves. These interventions may work in one of two ways: either they help individuals to appraise specific challenges outside of themselves in a more constructive way or the intervention helps individuals’ appraisal of themselves. The social psychological intervention that helps individuals reappraise themselves stems from self-affirmation theory.

Social psychological research has shown that short interventions, such as 10-minute self-affirmation exercises, can have positive effects that continue for years (Cohen et al., 2006, 2009; Sherman et al., 2013). These effects are possible because an impactful intervention is not so different from a formative experience. The intervention itself, which can be like a formative experience, is seen as part of a cycle of adaptive potential rather than as a standalone treatment. This cycle of adaptive potential is described as a series of “reciprocally reinforcing interactions between the self-system and the social system… the self acts, the social system reacts; and the cycle repeats in a feedback loop” (Cohen & Sherman, 2014, p. 341). These interventions, when timely, can help individuals shift their perspectives in a long-lasting way, which can build on itself over time long after the intervention has ended and conscious memory of the intervention has also faded (Walton & Cohen, 2011; Wilson, 2011).

Self-affirmation theory. When the self can be affirmed in another domain prior to being exposed to information of a threatening nature, the individual is much more likely to be receptive and open to the information even if it is highly threatening to his or her currently held beliefs.
This concept is the crux of self-affirmation theory, namely, that the need to respond defensively to threatening information is reduced if one’s self-image can be affirmed in some other way.

Self-affirmation theory postulates that people seek to maintain self-integrity (Cohen & Sherman, 2014). Self-integrity is defined as a sense of global efficacy or being able to uphold a “global narrative of oneself as a moral and adaptive actor (‘I am a good person’), not a specific self-concept (‘I am a good student’)” (Cohen & Sherman, 2014, p. 336). Thus, a self-affirmation is an act that shows one’s adequacy. Affirmations can range from subjectively small acts (e.g., receiving a note of encouragement) to subjectively big acts (e.g., receiving an award). Even small acts to the self-system can produce meaningful effects of large magnitude because a healthy self-system is inherently inclined to restore and maintain integrity through generating affirming meanings (Steele, 1988). Self-affirmations come in many forms with self-relevant activities holding the most potential for affirmation (e.g., individuals who value cooking might be affirmed simply by wearing their aprons).

While there are many inductions of self-affirmation, the most widely employed experimental manipulation is asking participants to write about core personal values. One of the reasons this induction is effective is because people value different qualities; having them rank their values in order of importance first and then asking them to write about their top value allows them to tap into the internalized standards they use to evaluate themselves (Cohen & Sherman, 2014). Therefore, the induction exercise becomes very personal and applicable to individuals’ subjective judgments of themselves (Rokeach, 1973).

Extensive research on self-affirmation interventions has shown that such interventions
interrupt the normally threatening nature of high-risk information, acting as a buffer of sorts. For example, Cohen, Aronson, and Steele (2000) illustrated the buffering effect of a self-affirmation intervention even when administered in conjunction with material opposing strong socio-political beliefs in college students. These researchers recruited undergraduates who were either very much in favor of capital punishment or very much opposed. Participants were then randomly assigned to one of two conditions. The affirmation condition consisted of individuals taking a social perceptiveness test and then receiving positive feedback about their performance (i.e., scoring in the top 5%). The non-affirmation condition consisted of participants taking the same test but not receiving feedback on their performance. Participants were then asked to read a scientific journal article regarding the death penalty. The article was fictitious but crafted to be very persuasive. Participants in favor of capital punishment were given the article that waged against the death penalty and participants opposed to capital punishment were given the article waging for the death penalty. Finally, they were asked to complete a questionnaire assessing attitudes toward both the article and capital punishment in general. Findings revealed that those self-affirmed prior to being shown a counter-attitudinal scientific report change their attitude significantly more in the direction of the counter-attitudinal scientific report. Non-affirmed participants keep their original beliefs by displaying disconfirmation bias, looking for flaws in methodology and suspecting bias on the part of the authors.

Self-affirmation is effective through different but interrelated means. First, affirmations broaden individuals’ attention from a narrow focus on the possibility of threat and failure to reminding them of psychosocial resources beyond that threat (Sherman & Hartson, 2011). The tendency quickly to veer toward self-protection when perceiving a threat comes from the fight-
or-flight response: when self-affirmed, the individual see the stressor in the context of the big picture (Schmeichel & Vohs, 2009; Waksldak & Trope, 2009). For example, when non-affirmed participants were asked to judge the distance from themselves of a live but securely caged tarantula (a psychologically threatening stimulus), they inaccurately judge the tarantula as physically closer to them; in contrast, self-affirmed participants judge the distance accurately (Harber, Yeung & Lacovelli, 2011). Second, by perceiving a threat from a broader viewpoint, self-affirmed college students focus less on ruminative thoughts of past failure than their non-affirmed counterparts (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999).

Affirmations also enable the individual to face the perceived threat at hand rather than recoil from it and expend mental energy on avoidance, suppression, and/or rationalization (Koole et al., 1999; Taylor & Walton, 2011). The efficacy of self-affirmation does not stem from promoting a naïve, optimistic view of oneself and the information of a threatening nature but rather promotes a more objective view of all stimuli. For example, participants who were self-affirmed pick up on their errors on a cognitive task more than non-affirmed participants and pay greater attention to learning from their mistakes as measured by error-related negativity, which is a neural signal of the brain’s error-detection system. Additionally, self-affirmation has been shown to improve problem solving in chronically stressed participants even under the pressure of solving 30 difficult problems in a limited amount of time in front of an evaluator (Creswell, Dutcher, Klein, Harris, & Levine, 2013).

**Mindfulness.** Mindfulness is defined as “inherently a state of consciousness which involves consciously attending to one’s moment-to-moment experience” (Shapiro, Carlson,
Astin, & Freedman, 2006, p. 374). Being mindful in the moment allows a gap to form naturally between the perceiver and her or his personal narrative; it allows the individual to observe and witness her or his thoughts rather than to be entirely identified with them (Shapiro, Carlson, Astin, & Freedman, 2006). The moment-by-moment practice of mindfulness can act as an organic buffer between identifying with the narrative and contemplating it from, what can be said to be, an objective third party perspective. This process was termed re-perceiving by Shapiro et al. (2006), who explicated that re-perceiving through mindfulness is akin to the psychological concepts of decentering, de-automatization, and detachment. Decentering has been described as “stepping outside of one’s immediate experience” (Safran & Segal, 1990, p. 117). De-automatization has been seen as “an undoing of the automatic processes that control perception and cognition” (Deikman, 1982, p. 137). Detachment has been conceptualized as “the interrelated processes of gaining ‘distance’ and the expansion of ‘attentional space’” (Bohart, 1983, p. 378). The comparison of mindfulness to decentering, de-automatization, and detachment is pertinent to qualify mindfulness as an appropriate intervention on par with self-affirmation interventions for purposes of this study.

Essentially, self-affirmation inductions have been successful because they shift the focus of the individual to see the threat in question in the context of the big picture; thus the threat and its implications command less vigilance (Sherman & Cohen, 2014). In a similar manner, mindfulness allows for, within the individual, a shift in perspective that can manifest itself as dis-identification from the content of one’s mind (e.g., thoughts, feelings, self-concepts, memories), which results in a “profound shift in one’s relationship to thoughts and emotions, the result being greater clarity, objectivity, and perspective” (Shapiro et al., 2006, p. 379).
In essence, a mindfulness induction can alter the relationship one has to one’s thoughts and “life story,” thus acting similarly to a self-affirmation induction. The process of re-perceiving has been said to be akin to the concept of cognitive diffusion where one is changing one’s relationship to thought rather than altering or controlling the content of the thought itself. For example, Shapiro et al., (2006) have explained one of the effects of the process of mindful observing/witnessing as follows:

The ‘self’ starts to be seen through or desconstructed— i.e., it is realized to be a psychological construction, an ever changing system of concepts, images, sensations and beliefs. These aggregates or constructs, that were once thought to comprise the stable self, are eventually seen to be impermanent and fleeting …through this change in perspective, identity begins to shift from the content of awareness to awareness itself (p. 379).

Both inductions shift the individual’s perspective and expand her or his attentional exposure to more mental resources once the perception of psychological threat is managed. As Sherman and Hartson (2011) have put it, “Affirmations remind people of psychosocial resources beyond a particular threat and thus broaden their perspective beyond it” (Cohen & Sherman, 2014, p. 339).

Mindfulness allows for added cognitive, emotional, and behavioral flexibility, which is fundamentally at the center of behavior change (Shapiro et al., 2006). Mindfulness has been hypothesized to be an effective way for the individual to witness thoughts that arise from psychological threat with a more objective perspective. Additionally, mindfulness may allow the individual to be able to recognize and thus access additional self-resources when faced with self-relevant counter-attitudinal and high-risk health information that might threaten her or his sense
Self-esteem. Self-esteem is another factor found to influence the effects of self-affirmation interventions on reducing individual biases. In line with this, Steele and Liu (1983) conducted three experiments on whether ego or consistency motives mediate dissonance processes through self-affirmation interventions. Their major hypothesis rested on the logic that, if dissonance is created by a “threat to the self (ego) inherent in a given inconsistency, then after dissonance has been aroused, thoughts and actions that affirm an important aspect of the self-concept should reduce dissonance by casting the self in a positive light” (p. 14).

In Study 1, Steele and Liu had participants in one condition affirm a self-relevant value by completing a scale immediately after choosing to write a counter-attitudinal essay; subjects then reported their attitudes on a questionnaire measuring their individual dissonance reduction. Participants in the second condition affirmed a value that was not part of their self-concept and also chose to write a counter-attitudinal essay; here, however, the order of the attitude questionnaire and the value scales was reversed. In a third control condition, subjects were given no choice in writing the essay. Findings indicated that an affirmation intervention in the form of a self-relevant value scale reduces dissonance even though it does not resolve the underlying inconsistency produced by the dissonant act of writing a counter-attitudinal essay.

Study 2 employed the same two conditions as Study 1 with the addition of a third condition in which participants were reminded of their dissonant essay after the affirmation intervention. Results indicated that the effect of the self-affirmation intervention is strong enough to counter against the reinstatement of dissonance. Study 3 was conducted to assess several remaining alternative explanations of self-affirmation effects; it replicated the effect with a different measure of dissonance reduction and different values for affirmation and attitudes.
Thus, Steele and Liu’s collective research has demonstrated that participants, when affirming self-values (even those unrelated to the threat) are less rationalizing of self-threatening inconsistencies.

This tendency has been called the flexibility of the self-evaluative system. Tesser and Cornell (1991) demonstrated this system in their research on self-image. In one study, they asked participants and one of their friends (in pairs of two) to fill out a six-item scale denoting which categories of the scale had higher personal significance for them. Participants were also asked to rank-order the items from least to most important. They were then assigned to the high-relevance or low-relevance condition. Participants in the high-relevance condition were asked to complete an exercise and were told that performance on this exercise was highly related to general intelligence. Researchers told participants in the low-relevance condition that they were not sure what the exercises measured, if anything at all. Next, the affirmation manipulation was administered: participants were randomly assigned either to an affirmation or no-affirmation condition. Those in the affirmation condition were given a 10-item Study of Values sub-scale for the category that they had previously chosen as their most important value. Those in the no-affirmation condition received the sub-scale denoting the category that they ranked as least important. All were then given answer sheets to the exercise they had previously completed with their score and ranking; the ranking always indicated that they ranked third with their friend and a stranger performing better. They were asked to examine the answer sheet carefully and write down a clue regarding the exercise for future participants. They were also asked to be a judge of what clues to pick from the pool of clues that others had written ultimately to compile a
master clue sheet. Results indicated that the self-affirmation intervention reduces the participants’ inclination to use self-evaluation maintenance (SEM) behaviors.

Tesser and Cornell (1991) explained that self-affirming in one area neutralized self-image distresses in a different area. The distress created from an unfavorable social comparison was eliminated by a value affirmation that reduced dissonance (Steele & Liu, 1983). Steele, Spencer, and Lynch (1993) examined this flexibility by asking the question: If individuals can quell their reactions to specific self-image threats by recruiting self-knowledge and other beliefs, is it possible that people with more favorable self-concepts, meaning more self-esteem, may be more resilient to specific self-image threats versus people with fewer favorable self-concepts? (p. 2).

Chapter II

Method

The present study compares the effects of four different treatment conditions on college students’ acceptance of self-relevant, high-risk health information within the sexual domain of functioning. Other factors need to be assessed in conjunction with self-affirmation because previous research has indicated that self-affirmation interventions, although effective for many, vary across individuals. Thus, this study employs the related construct of mindfulness, leading to four different conditions, namely, self-affirmation intervention, mindfulness intervention, self-affirmation and mindfulness intervention, and a control group. The dependent variables consist of four attitudinal measures (indicators of openness to the sexual health-risk messages, attitudes toward STI testing, intentions regarding STI testing, and using protection) and three behavioral measures (taking educational brochures, taking condoms, making an appointment for STI
testing) following the intervention, which serve to illustrate participants’ receptivity to self-relevant, high-risk sexual health information.

Participants

Participants were recruited through the SONA systems portal provided by Harvard University and by flyers placed throughout the Harvard University psychology department. Recruitment and experimentation took place over 3 months, from September through November 2017. Study credit (0.5) was awarded to participants who chose not to enter into the raffle for a $100 Amazon gift card. Inclusion criteria included fluency in English and self-reporting as sexually active. Exclusion criteria specified that those without English fluency, those who did not self-report as sexually active, and those who previously had contracted STIs were not eligible for participation. The participants were comprised of 81 undergraduate students from Harvard University, ranging in age from 18-29 years. There was an approximately equal number of males (42.5%) and females (57.5%).

Because participants were ultimately to be randomly distributed across four treatment conditions, a number of potential covariates were assessed. These included gender, current relationship status (yes/no), whether the individual was tested for STIs in his or her current relationship (yes/no), whether the individual was tested for STIs within the past 12 months (yes/no), individual level of concern for exposure to STIs (from 1 = not at all concerned to 9 = extremely concerned), individual trait mindfulness, and individual self-esteem. The first five were obtained from background information and other sheets (below). The last two were obtained from standard tasks, namely, the Langer Mindfulness Scale and the Rosenberg Self-Esteem Scale, each of which is briefly described below.
**Langer Mindfulness Scale.** Individual trait mindfulness was assessed with the Langer Mindfulness Scale-21 or LMS-21 (Bodner & Langer, 2001). This scale is comprised of 21 items such as “I am always open to new ways of doing things,” “I do not actively seek to learn new things,” and “I have an open mind about everything, even things that challenge my core beliefs.” Participants are asked to rate each item from $1 = \text{strongly disagree}$ to $7 = \text{strongly agree}$. Eight of the 21 items require reverse scoring so that overall mindfulness scores (the major measure employed here) range from 21 to 147 with higher scores indicating higher trait mindfulness. The scale also yields four subtest scores, namely, flexibility, novelty seeking, novelty producing, and engagement, which were not employed in the present investigation. The LMS has been shown to possess above adequate reliability and validity (cf. Pirson, Langer, Bodner, & Zilcha, 2018).

**Rosenberg Self-Esteem Scale.** Personal self-esteem was measured with the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The scale consists of 10 items including: “On the whole, I am satisfied with myself,” “I feel that I’m a person of worth, at least on an equal plane with others,” and “I am able to do things as well as most other people.” Each item is rated on a Likert scale from $1 = \text{strongly disagree}$ to $4 = \text{strongly agree}$. Five of the 10 items require reverse scoring so that the scale yields a global self-esteem score ranging from 10 to 40 (employed as the major measure here) with higher scores indicating higher individual self-esteem. The scale has been used extensively in research since its introduction in 1965 with numerous reports of above adequate reliability and validity.

Participants were randomly assigned to one of four groups (see Design and Procedure below). Preliminary analyses indicated that the groups did not differ from one another with respect to these seven variables so they were not employed as covariates in subsequent analyses. Table 1 reports the findings and statistics for these seven measures for each experimental group.
Table 1

Variables Demonstrating No Significant Differences Among Four Study Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group Data</th>
<th>Test Statistic</th>
<th>Significance</th>
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<tbody>
<tr>
<td>Gender: % Female</td>
<td></td>
<td>$\chi^2(3, N = 81) = 1.80$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Group A</td>
<td>61.1%</td>
<td></td>
<td></td>
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<tr>
<td>Group B</td>
<td>66.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>52.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>71.4%</td>
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<tr>
<td>Relationship Status: % Yes</td>
<td></td>
<td>$\chi^2(3, N = 81) = 4.03$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Group A</td>
<td>66.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>57.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>38.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>42.8%</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td>Group B</td>
<td>23.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>28.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>28.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STI Testing in Current Relationship: % Yes</td>
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<td>$\chi^2(3, N = 81) = 2.34$</td>
<td>n.s.</td>
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<tr>
<td>Group A</td>
<td>27.7%</td>
<td></td>
<td></td>
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<tr>
<td>Group B</td>
<td>23.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>9.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>19.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concern About STI Exposure: $M (SD)$</td>
<td></td>
<td>$F(3, 77) = 0.02$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Group A</td>
<td>2.1 (0.9)</td>
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<td>Group B</td>
<td>2.0 (1.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>2.0 (1.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>2.1 (1.6)</td>
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<tr>
<td>LMS21: $M (SD)$</td>
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<td>$F(3, 77) = 1.50$</td>
<td>n.s.</td>
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<tr>
<td>Group A</td>
<td>108.2 (8.1)</td>
<td></td>
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</tr>
<tr>
<td>Group B</td>
<td>110.3 (13.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>113.6 (10.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>106.4 (11.1)</td>
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<td></td>
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<tr>
<td>S-E Scale: $M (SD)$</td>
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<td>$F(3, 77) = 0.30$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Group A</td>
<td>22.7 (4.7)</td>
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<td></td>
</tr>
<tr>
<td>Group B</td>
<td>21.1 (4.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group C</td>
<td>22.1 (6.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group D</td>
<td>22.4 (4.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Design and Procedure

The study employed a between-subjects design with participants randomly assigned to one of four conditions (Group A = control group; Group B = affirmation intervention; Group C = mindfulness intervention; Group D = affirmation x mindfulness intervention) to investigate the effects of different interventions on openness to self-relevant, high-risk health information.

Each participant was tested individually in a large room in William James Hall (Harvard University Psychology Department). After providing informed consent in which participants were told that the study’s purpose was to examine attitudes relating to certain kinds of information (see Appendix C), each participant experienced the experimental procedures and completion of forms, which generally ranged from 30 to 40 minutes. This included 10 minutes or less for completion of background forms, 10 minutes for the self-affirmation intervention (Groups B and D), 7 minutes for the mindfulness intervention (Groups C and D), 10 minutes for the health-risk information administration, and 5 minutes for the post-test questionnaires. Participants were debriefed post-study.

A step-by-step breakdown of the procedures following the obtaining of informed consent is as follows:

1. Pretest: A questionnaire was administered with the question “Are you concerned that you have been exposed to STDs or the HIV virus sexually?” on a 9-point scale anchored at not at all concerned (1) to extremely concerned (9). The LMS-21 and Rosenberg Self-Esteem Scale were also administered to all participants as baseline measurements.

2. (a) Control Group: Participants in the control group were given the health-info packet to read
immediately after the pretest questionnaires. They were not involved in any intervention.

(b) **Self-Affirmation Intervention** (Conditions B and D): After Sherman et al. (2000), participants were presented with a list of 11 different values that they were asked to rank in order of importance to them (with 1 being the most important) The list is entitled the Sources of Validation Scale, which has been validated and employed in many other self-affirmation studies. Participants are then asked to select their top most important value and reflect on it while writing why this value is meaningful to them for 10 minutes.

(c) **Mindfulness Intervention** (Conditions C and D): Participants in two conditions were asked to complete a mindfulness exercise. The mindfulness exercise employed was a variation of Guilford’s (1967) Alternative Uses Test designed to measure creative thinking and/or cognitive flexibility. This exercise promotes mindfulness by asking each participant to generate as many possible uses for given objects such as paperclips or chairs. Here, participants were presented with four objects (paperclip, silver necklace chain, small globe shaped foam “stress ball,” plastic knife) and asked to generate as many uses for the object as they could in the allotted time of 1 minute per object.

(d) **Affirmation x Mindfulness Intervention** (Condition D): Participants in this condition were administered the affirmation intervention (above) followed by the mindfulness intervention (above).

3. **Health Message:** Participants read a Center for Disease Control (CDC) fact information packet entitled “Incidence, Prevalence, and Cost of Sexually Transmitted Infections in the United States.” This packet is four pages and includes the statistics of total STI infections reported annually and the medical costs of these infections. Thus, this information packet offers another perspective regarding STIs as affecting not only the individual but also the environment at large.
Participants then read another fact packet by the CDC entitled “STDs and HIV,” which contains basic information regarding how STIs and HIV are related.

4. **Attitudes Toward Health-Risk Information**: Participants then completed four items assessing their attitudes toward the sexual health risk information (adapted from Liberman & Chiken, 1992). These items included the following. (a) *I believe that STIs are more common than people think* (rated from 1 = *strongly disagree* to 7 = *strongly agree*). (b) *I believe that everyone should get tested for STIs every few months* (rated from 1 = *strongly disagree* to 7 = *strongly agree*). (c) *For me to get tested for STIs and AIDS over the next two months would be .....* (rated from 1 = *extremely worthless* to 7 = *extremely valuable*). (d) *I intend to increase the number of times I get tested* (rated from 1 = *absolutely not* to 5 = *absolutely will*).

5. **Behavioral Measures**: Three behavioral dependent measures assessed actual STI preventive behaviors. These behaviors included options to: make an appointment at a Harvard Health Clinic and a local Planned Parenthood Clinic for STI screening; to pick up condoms from a large bowl positioned on the testing table; and to take STI educational brochures, also displayed on the testing table. Participants were told about the condoms and educational brochures as well as about a computer ready for them to make an appointment at a clinic if they wished to do so prior to the experimenter’s informing them that she would be leaving the room and closing the door to give them some privacy. Following each participant’s departure, the numbers of condoms and brochures left were counted to ascertain whether she or he had taken any. The computer history was also checked to see if she or he chose to book an appointment at either of the two clinics.

Thus, collectively there were seven dependent measures employed in the study. Four of the measures were attitudinal (openness to health-risk information, intentions to get STI tested, attitude toward value of STI testing, and intended frequency of STI testing). Three of the
measures were behavioral (took brochures yes/no, took condoms yes/no, made appointment for STI testing).

**Data Analysis**

IBM SPSS version 24 was used to perform statistical data analysis. The study yielded both parametric (e.g., LMS scores, rating scales) and nonparametric (e.g. yes/no on each of the three behavioral measures) data. The parametric data were analyzed by a one-way multivariate analysis of variance (MANOVA) with the four experimental conditions (interventions) as a between-subjects variable. The MANOVA was followed by the appropriate univariate $F$ tests and planned comparisons. The nonparametric data were treated by independent chi-square tests (e.g., for each of the three behavioral measures, experimental condition served as one axis of classification and yes/no as the other axis of classification). If the overall chi-square tests were significant, additional 2 x 2 chi-square tests were computed to determine the source(s) of the significance.

**Aims**

The study’s primary aim is to assess the hypotheses that: those in the self-affirmation x mindfulness condition will be more likely to engage in health-promoting attitudes and behaviors than those in the remaining three groups; and participants in the self-affirmation condition and mindfulness condition will be more likely to engage in health-promoting attitudes and behaviors than those in the control condition.
Chapter III

Results

Sample as a Whole

While demographic and other information concerning the four groups that comprise the sample as a whole is presented in Table 1, the interested reader can compute the overall means on the seven variables for the sample as a whole. However, it is particularly noteworthy that, on the variable of testing for STIs within the last 12 months, only 30% had received such testing while the vast majority (70%) had not. This spurious finding may be particularly surprising for some given the very public awareness given to STIs and HIV/AIDS within our contemporary society. What may be even more surprising is that this finding was obtained from a sample of undergraduates at Harvard University, which is not a representative sample of the U.S. undergraduate population given their high levels of intelligence and achievement.

Are There Interventions to Change People’s Sexually Related Health Behaviors?

A one-way multivariate analysis of variance (MANOVA) on the 4 attitudinal questions comprising 4 of the study’s 7 dependent measures was significant, Wilks’ $\Lambda = 1.63, p < .05, \eta^2 = .14$. Thus, there was an overall difference in responses on the four dependent measures based on the subject group/condition. Follow-up univariate $F$ tests indicated that the groups differed on two of the four questions.

First, participants’ ratings (from 1 = extremely worthless to 7 = extremely valuable) to the question “For me to get tested for STIs and HIV/AIDS over the next two months would be…” indicated a significant difference among the four groups, $F(3,77) = 2.70, p < .05, \eta^2 = .09$. Planned comparisons indicated that those in the mindfulness group ($M = 4.7, SD = 1.5$) rated
STI testing as more valuable than those in the other groups (affirmation group \(M = 3.4, SD = 1.7\); control group, \(M = 3.7, SD = 1.8\); affirmation x mindfulness, \(M = 4.3, SD = 1.6\)).

Second, participants’ ratings (from 1 = absolutely not to 5 = absolutely will) to the question “I intend to increase the number of times I get tested” also indicated a significant difference among groups, \(F(3,77) = 3.0, p < .05, \eta^2 = .10\). Planned comparisons indicated that, relative to the other three groups (\(M\) affirmation group = 3.2, \(SD = .23\), \(M\) mindfulness group = 3.2, \(SD = .23\), \(M\) control group = 3.0, \(SD = .25\)), those in the affirmation and mindfulness group (\(M = 4.0, SD = .23\)) endorsed the item to a greater extent.

The nonparametric data were treated with independent chi-square tests for each of the three behavioral measures with experimental condition as one axis of classification and yes/no as the other axis of classification. Attempts were made to combine the three measures but this did not appear feasible because the majority of participants engaged in only one behavioral measure, namely, taking condoms.

Nonetheless, while there were no significant differences among groups with respect to the behavioral measure of taking condoms, \(X^2(3, N = 81) = .23, n.s.\), and taking brochures, \(X^2(3, N = 81) = .32, n.s.\), the groups did differ significantly with respect to the proportions of group members who signed up for STI screening, \(X^2 (3, N = 81) = 5.35, p < .05\). In the control condition, 3 of 18 participants (16.6%) made appointments versus 15 of 18 (83.3%) who did not. In the affirmation condition, 4 of 21 participants (19%) made appointments while 17 of 21 (80.9%) did not. In the mindfulness condition, 0 of 21 (0%) participants made appointments. However, in the affirmation x mindfulness condition, 5 of 21 (23.8%) participants made appointments while 16 of 21 (76%) did not. Follow-up chi-squares indicated that a greater percentages of those in the affirmation x mindfulness condition made appointments for STI
screening relative to those in the other three groups, whose percentages did not differ from each other.

Chapter IV

Discussion

This investigation was conducted to assess whether differential conditions would lead to college students’ acceptance of high-risk health information within the domain of sexual functioning. The conditions included a self-affirmation intervention, a mindfulness intervention, a combination of self-affirmation and mindfulness intervention, and a control condition. Specifically, the study assessed whether mindfulness leads to less biased processing of health information when combined with a self-affirmation intervention and how it compares to a strictly self-affirmation intervention as well as to a control condition. It tested the major hypothesis that, relative to those in other conditions, participants in the self-affirmation and mindfulness condition will be more likely to engage in health-promoting behaviors (e.g., obtaining information, taking precautions, getting screened for STIs). Some support for this hypothesis was obtained. The study is important because, while self-affirmation interventions have been shown to improve the acceptance of high-risk health information, responses continue to vary across individuals and thus mindfulness was considered as a possible factor that could be contributing to the variation in responses across individuals (Sweeney & Moyer, 2004). Analyses indicated that the mindfulness condition was the most effective for leading college students to consider being screened for STIs. Specifically, those in the mindfulness condition rate the idea of getting tested within the next two months as more valuable compared to participants in the other groups.
With respect to increasing positive attitudes toward the frequency of STI screening, the combination condition (affirmation x mindfulness group) is the most effective. In terms of behavioral measures, participants in the combination condition more often take action and book the most appointments for STI screening, relative to those in the other conditions. Thus, together with previous studies, support was obtained for the generalization that both mindfulness and self-affirmation, individually and in combination, have the potential to positively influence the health related sexual attitudes and behaviors of college students.

Further, findings indicated that 60% of participants take condoms and the frequency with which they do so does not differ among groups. In contrast, only 12% of participants across the four conditions take brochures, the frequency of which also does not differ among groups. This suggested that, while one can offer people information (educational brochures), many if not most people will not take and thus read the information. However, if one makes available and offers individuals free preventative health tools (condoms), they will be more likely to engage with and take the materials regardless of a host of other variables (e.g., gender, relationship status, having been recently tested). Further, when the actual means to get tested is presented and the opportunity made available, people are more likely to take the initiative to schedule an STI screening. Although the present research supports these generalizations within college students, future research should consider assessing these notions in groups differing in age (e.g., younger adolescents, older young adults) and in college samples that may be more reflective of undergraduates within the general population.
Limitations and Future Directions

Many of the items serving as dependent measures in the present study asked participants to report if they were going to get tested or use protection. However, one participant reported that she did not reply “yes” to such items because her partner was a virgin when they began dating, thus knowing that both individuals in the couple were STI free. Alternatively, some couples had already received testing prior to 12 months ago and had not changed partners so that similarly they also knew they were not in need of testing. Several additional participants provided feedback that they had answered “no” on those items not necessarily because the “intervention” did not work but because their personal circumstances made the measures irrelevant to their situations.

In a different vein, another limitation of the study was that the mindfulness intervention employed—a variation of Guilford’s (1967) Alternative Uses Test—may not have been successful in encouraging mindfulness in some participants. For example, some participants reported that, during the intervention, they became extremely nervous having to think of alternative uses for the objects on the spot (despite being told, at the onset of the task, that the exercise was not graded and that there were no “right” or “wrong” answers and hence “no pressure to perform well”), some participants experienced significant anxiety, possibly not coming to understand on any level that the task involved cognitive flexibility. Thus, future research on mindfulness interventions to promote receptivity to self-relevant at-risk health information might do well to consider employing alternative tasks of mindfulness of which there are many (e.g., having subjects employ conditional thinking to imagine themselves having contracted an STI).
A third possible study limitation is that participants might not have felt comfortable in booking an appointment at a clinic for STI screening on a computer that was not their own. In a similar manner, they may also not have felt completely comfortable taking brochures and condoms from the testing room for fear that they may have somehow been being observed and/or that the experimenter, even though she excused herself from the room, might reappear at any moment. Thus, future research might obtain even stronger findings if a secure maximum amount of privacy was afforded participants.

In addition to employing a more robust intervention for the mindfulness condition as well as noting and/or assessing which participants display signs of minor anxiety by the intervention itself (thereby potentially being able to employ anxiety level as a moderating variable), there is clearly value in asking participants to elaborate on and/or explain their self-report data (as previous examples demonstrate). Thus, consideration of the complementarity of quantitative methodologies (that generally attempt to predict and control human behavior) and qualitative methodologies (that generally aim to describe and understand human behavior and experience) might represent an advance in psychological science rather than an irreconcilable difference as it historically has sometimes has become.

Despite its limitations, the study exhibits additional theoretical and practical strengths. For theory, it suggests that holistic conceptualization of empirical problems that assess both participants’ attitudes and behavior has the potential to help us understand the complexity of human functioning in the real world context. Moreover, toward this end, there may be the need to go even further with conceptualization and assessment of human functioning more broadly defined to consider functioning at the biological, psychological (including cognition, affect, valuation, and behavior) and sociocultural levels of organization and their interrelations (see
Demick, in press).

For practice, the study highlights the need for continued research on college students’ receptivity to sexual health information regardless of the theoretical perspective that frames such research. Arguably one of the most interesting findings to emerge from this study is that, in this sample of college students who are not representative of the entire population of American college students, only 30% have been tested for STIs within the last 12 months. Although this percentage is almost staggering, one can only imagine and does not have to look hard to find that this percentage is considerably lower among U.S. college students in general. Statistics from the American Sexual Health Association (2018) has indicated that only about 12% of the American college population has been tested for STIs within the last year. Given that one out of every two sexually active persons will contract an STI by the age of 25 years and that individuals between the ages of 15 and 25 years constitute nearly half of the 20 million new STI cases occurring in this country every year (with these numbers only expected to rise), one can only imagine that the percentage of non-matriculated college-aged individuals who have undergone STI screening within the last year is likely even much lower.

Although new advances have allowed those living with some chronic STIs (e.g., HIV, syphilis, hepatitis) to lead longer, productive lives, other STIs still have dire consequences for those infected. For example, undiagnosed and untreated chlamydia and gonorrhea in women can lead to pelvic inflammatory disease (PID) with one of every eight women with a PID history experiencing difficulties getting pregnant (including infertility). Further, human papillomavirus (HPV) is responsible for approximately 31,500 cases of cancer each year, including nearly all cases of cervical and anal cancer, about 75% of vaginal cancer, 70% of oropharyngeal cancer, and 69% of vulvar cancer. Thus, as psychologists concerned with ameliorating the human
condition, the need to increase all individuals’ receptivity to sexual health information has come. It has clearly come for adolescents and young adults and increasing this receptivity appears well suited to occur in the college context. Thus, the present study represents one small step toward this extremely important end.


Table 1

*Variables demonstrating no differences between four experimental groups*

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>$\chi^2$, df</th>
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<tr>
<td>Group C</td>
<td>38.0%</td>
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<tr>
<td>Group D</td>
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<td>1.10, 3</td>
<td>n.s</td>
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<td>Group B</td>
<td>23.8%</td>
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<tr>
<td>Group C</td>
<td>28.5%</td>
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<tr>
<td>Group D</td>
<td>28.5%</td>
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<td>2.34, 3</td>
<td>n.s</td>
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<td>Group B</td>
<td>23.8%</td>
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<td></td>
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</tr>
<tr>
<td>Group C</td>
<td>9.5%</td>
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</tr>
<tr>
<td>Group D</td>
<td>19.0%</td>
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<td></td>
<td></td>
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<tr>
<td>Concern about STI exposure (1-9)</td>
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<td></td>
<td>F (3,77) = 0.02</td>
<td>0.9, n.s.</td>
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<td>0.9</td>
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<td>Group C</td>
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<tr>
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<td>22.4</td>
<td>4.5</td>
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</table>
Informed Consent Form

Study Title: Mindfulness and health attitudes and behaviors
Researcher: Zahra Dabirzadeh

**Participation is voluntary**
It is your choice whether or not to participate in this research. If you choose to participate, you may change your mind and leave the study at any time. Refusal to participate or stopping your participation will involve no penalty or loss of benefits to which you are otherwise entitled.

**What is the purpose of this research?**
The purpose of this study is to further our understanding of decision making, and acceptance of high-risk health information.

**How long will I take part in this research?**
Your participation will dependent on which condition you are randomly placed in. Participants in condition I can expect to participate in the study for 30-35 mins, participants in condition II for 28-35 mins, participants in condition III for 37-40 mins, and participants in condition IV for 27-30 mins.

**What can I expect if I take part in this research?**
You can expect to be completing assessments measuring different qualities about yourself including health information and your behavior, reading material, and completing surveys.

**What are the risks and possible discomforts?**
If you choose to participate, we do not anticipate risk beyond that which is minimal. Minimal psychological discomfort may occur, for example, as a result of completing self-administered assessments. These assessments will ask you to think and rate your opinion on your sexual health, for example: whether you believe you should get a health screening for STIs, and HIV/AIDS. Reading health information that may be relevant to your life could be psychologically stressful. The reasons for this are varied and are highly unique to each individual, for example; reading health information might trigger memories of a relative that has been affected by an STI or cause you to think about your health. There is no foreseeable reason why the health information might be psychologically stressful. Furthermore, we provide contact information in this Informed Consent should any concerns, at all, arise.
Possible benefits of being in this research study
We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include learning new information from the fact sheets.

Will I be compensated for participating in this research?
Yes, there will be a raffle for a $100 Amazon gift card. Participant’s code which corresponds to their name will be entered into a random number generator which will randomly pick one of the codes. The participant code, is a number that is assigned to each participant’s name to ensure confidentiality and remove bias from the raffle draw. The timing of the raffle will be at the end of the study so that every participant has had a chance to enter into the draw, their code will be entered into the draw regardless of whether they completed the study or decided to withdraw from the study. Each participant’s chance at winning the gift card will be equal. The winner will be emailed with instructions to activate their Amazon gift card immediately after the draw is completed. Each participant can choose to receive 2 study pool credits for their psychology class(es) which is determined based on the amount of time they will each be in the study, they would all qualify to receive 2 credits based on the amount of time of the study which for participation in either conditions will take anywhere from 27 to 40 minutes.

If I take part in this research, how will my privacy be protected? What happens to the information you collect?
The data we collect will be stored in a locked filing cabinet and will be destroyed after one year. A copy of this may be kept on a password-protected file on the PI’s computer. All data will be published in aggregate. The information with your name on it will be analyzed by the researcher(s) and may be reviewed by people checking to see that the research is done properly.

If I have any questions, concerns or complaints about this research study, whom can I talk to?
The researcher for this study is Zahra Dabirzadeh who can be reached at zdabirzadeh@g.harvard.edu, 33 Kirkland Avenue, William James Hall, 13th Floor, Cambridge, MA. The faculty sponsors: Ellen Langer, langer@wjh.harvard.edu and Jack Demick who can be reached at jackdemick1@gmail.com.

- If you have questions, concerns, or complaints,
- If you would like to talk to the research team,
- If you think the research has harmed you, or
- If you wish to withdraw from the study.

This research has been reviewed by the Committee on the Use of Human Subjects in Research at Harvard University. They can be reached at 617-496-2847, 1350 Massachusetts Avenue, Suite 935 Cambridge MA, 02138, or cuhs@harvard.edu for any of the following:
• If your questions, concerns, or complaints are not being answered by the research team,
• If you cannot reach the research team,
• If you want to talk to someone besides the research team, or
• If you have questions about your rights as a research participant.

**Statement of Consent**  
I have read the information in this consent form. All my questions about the research have been answered to my satisfaction.

**SIGNATURE**  
Your signature below indicates your permission to take part in this research. You will be provided with a copy of this consent form.

__________________________________________________  
Printed name of participant

__________________________________________________  
Signature of participant                                  Date
Appendix B

PERSONAL OUTLOOK SCALE

Instructions: Below are a number of statements that refer to your personal outlook. Please rate the extent to which you agree with each of these statements. If you are confused by the wording of an item, have no opinion, or neither agree nor disagree, use the "4" or "NEUTRAL" rating. Thank you for your assistance.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rating 1</th>
<th>Rating 2</th>
<th>Rating 3</th>
<th>Rating 4</th>
<th>Rating 5</th>
<th>Rating 6</th>
<th>Rating 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to investigate things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>I generate few novel ideas.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>I am always open to new ways of doing things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>6</td>
<td>7</td>
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<tr>
<td>I “get involved” in almost everything I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>I do not actively seek to learn new things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>I make many novel contributions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>I stay with the old tried and true ways of doing things.</td>
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<td>2</td>
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<td>4</td>
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<td>6</td>
<td>7</td>
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<tr>
<td>I seldom notice what other people are up to.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>I avoid thought provoking conversations.</td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>I am very creative.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>Statement</td>
<td>1</td>
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<td>I can behave in many different ways for a given situation.</td>
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<td>I attend to the “big picture.”</td>
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<td>I am very curious.</td>
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<td>I try to think of new ways of doing things.</td>
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<td>I am rarely aware of changes.</td>
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<td>I have an open-mind about everything, even things that challenge my core beliefs.</td>
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<td>I like to be challenged intellectually.</td>
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<td>I find it easy to create new and effective ideas.</td>
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<td>I am rarely alert to new developments.</td>
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<td>I like to figure out how things work.</td>
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<td>I am not an original thinker.</td>
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Langer 21-item Mindfulness Scale (LMS 21)
Appendix C

Rosenberg Self-Esteem Scale (1965)

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

1. On the whole, I am satisfied with myself. SA A D SD
2.* At times, I think I am no good at all. SA A D SD
3. I feel that I have a number of good qualities. SA A D SD
4. I am able to do things as well as most other people. SA A D SD
5.* I feel I do not have much to be proud of. SA A D SD
6.* I certainly feel useless at times. SA A D SD
7. I feel that I’m a person of worth, at least on an equal plane with others. SA A D SD
8.* I wish I could have more respect for myself. SA A D SD
9.* All in all, I am inclined to feel that I am a failure. SA A D SD
10. I take a positive attitude toward myself. SA A D SD

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self esteem.
Sources of Validation Scale

RANKING OF PERSONAL CHARACTERISTICS AND VALUES

Below is a list of characteristics and values, some of which may be important to you, some of which may be unimportant. Please rank these values and qualities in order of their importance to you, from 1 to 11 (1 = most important item, 11 = least important item). Use each number only once.

——— Artistic skills/ aesthetic appreciation
——— Sense of humor
——— Relations with friends/ family
——— Spontaneity/ living life in the moment
——— Social skills
——— Athletics
——— Musical ability/ appreciation
——— Physical attractiveness
——— Creativity
——— Business/ managerial skills
——— Romantic values


Self-Affirmation Values Scale (Harber, 1995)
Appendix E

Post-Health Information Questionnaire

Rate each item: from 1 = strongly disagree to 7 = strongly agree, adapted from Liberman & Chaiken (1992).

A) “I believe that STIs are more common than people think” 1—2—3—4—5—6—7

B) “I believe that everyone should get tested for STIs every few months” 1—2—3—4—5—6—7

C) ‘For me to get tested for STDs and AIDS over the next two months would be...’: _______. Extremely worthless [1] to extremely valuable [7]).

1—2—3—4—5—6—7

D) “I intend to increase the number of times I get tested”. Circle your response. Absolutely not (1)....Absolutely will (5)

1—2—3—4—5

E) “I intend to use protection when I have intercourse”. Circle your response. Absolutely not (1)....Absolutely will (5)

1—2—3—4—5