

Sexual Minority Relationships Buffer Against Minority Stress And Substance Use

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Abstract

Sexual minorities experience unique stressors known as *minority stress*: the additional stress members of stigmatized groups experience solely because of their minority group membership. Added stress usually comes in the form of discrimination, from refusal of service and employment discrimination to hate crimes. Sexual minorities potentially respond to this discrimination by protecting themselves through concealing their identity.

Concealment is likely to be detrimental to people's self-regulation and health behaviors, which can put sexual minorities at higher risk of substance use. However, sexual minorities in relationships could be at lower risk than those not in relationships because of the support from a partner. The current study used an experimental analog to examine the hypothesis that concealing one's sexual identity leads to self-control depletion and increases alcohol and cannabis abuse. The final sample was comprised of 238 MTurk workers. There were no effects of condition on self-control depletion or the alcohol purchasing task indices.

Concealment condition had a significant effect on the relative value of both cannabis and gasoline, but there were no effects of partner salience condition. The discussion focuses on the implications of identity concealment on substance use.

Keywords: sexual minorities, concealment, substance use, self-control depletion, intimate relationships

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Sexual Minority Relationships Buffer Against Minority Stress and Substance Use

In 2013, the Supreme Court ruled the Defense of Marriage Act (DOMA) unconstitutional, leading to the legalization of same-sex marriage. In a surprising flip, the Supreme Court recently ruled in 2018, 7-2, in favor of a baker who refused service to a same-sex couple because he does not support non-heterosexual marriage. Ruling in favor of Masterpiece Bakery, the court has effectively justified discrimination against sexual minorities. The ruling is dangerous not only because it is discriminatory, but also because of the cascading impact it has on the behavioral health of sexual minorities. Sexual minorities often conceal their sexual identity, fearing discrimination.

Although concealment can seem adaptive, it is associated with negative consequences, such as substance use. However, not all hope is lost. A romantic partner may serve as a foundation of strength, providing an alternative coping mechanism to substance use. As same-sex couples become increasingly visible, more research is needed to understand discrimination, substance use, and where relationships fit in-between. The purpose of this research is to examine associations between concealment, relationships, and substance use in an experimental analog.

Minority Stress

Although approval of gay marriage is on the rise, the effects of stigma and discrimination still leave sexual minorities at risk. According to minority stress theory, stigmatized groups experience added stress (i.e., minority stress) due to their relatively low-status position in society (Meyer, 2003). As a result of this added stress, sexual minorities experience reduced economic opportunities, poorer mental health, and higher rates of substance use.

Sexual minorities experience poorer economic outcomes than heterosexuals. Specifically, sexual minority men earn 10-32% less than their heterosexual counterparts (Badgett, Lau, Sears, & Ho, 2007). Sexual minorities often report experiencing heterosexism in the workplace, and many sexual minorities report feeling uncomfortable being “out” at work (Cech & Pham, 2017; Waldo, 1999). Furthermore, 20-40% of all homeless youth are sexual minorities, yet sexual minorities only make up 3.5% of the general population (Gates, 2011; Ray, 2006).

Sexual minorities also experience poorer mental health than heterosexuals. Specifically, sexual minorities have a higher prevalence of mood and anxiety disorders. Sexual minority women are twice as likely as heterosexual women to have an anxiety disorder, and sexual minority men are 2.5 times as likely as heterosexual men to experience an anxiety disorder in their lifetime (Bostwick, Boyd, Hughes, & McCabe, 2010). Sexual minority men are five times more likely to have a panic disorder and 3.7 times more likely to have major depression than heterosexual men, and sexual minority women are 2.88 times more likely to have two disorders than heterosexual women (Cochran, Mays, & Sullivan, 2003). Furthermore, a meta-analysis of 19 studies found that 28% of sexual minority men and 37% of sexual minority women had a history of suicidality, compared to 17% and 23% of heterosexual men and women, respectively (Marshall et al., 2011).

Sexual minorities also report higher rates of substance use than heterosexuals. For example, sexual minorities are more likely to report an alcohol use disorder than heterosexuals (Coulter et al., 2018). Furthermore, sexual minorities are more likely than heterosexuals to engage in binge drinking, as well as high-intensity binge drinking (Fish, Hughes, & Russell, 2018). Sexual minorities are also more likely to use cannabis than

heterosexuals (Trocki, Drabble, & Midanik, 2009). More specifically, sexual minority men are more likely to report using cannabis in the past year and to report a cannabis use disorder than sexual minority women and heterosexual men and women (Hequembourg & Dearing, 2013). While sexual minority women do not use cannabis to the same extent as sexual minority men, they do report significantly more cannabis use than heterosexual women (Coulter et al., 2018; Parnes, Rahm-knigge, & Conner, 2017).

Relationship Buffering Model of Concealment and Substance Use

In the current manuscript, I propose a new conceptual model to explain, at least partially, the link between minority stress and substance use. The Relationship Buffering Model of Concealment and Substance use is presented in Figure 1. The model proposes that sexual minorities who conceal their identity will have higher rates of substance use than those who do not (path A). This relationship will operate through self-control depletion (paths B and C). However, the presence of a romantic partner will restore self-control (path D), mitigating the effects of concealing identity on substance use.

Concealment. People with a concealable stigma often engage in concealment to protect themselves. For example, people living in more stigmatizing countries are more likely to conceal their sexuality, avoiding potential discrimination and victimization (Pachankis et al., 2015). While this seems adaptive, the stress associated with concealment leads to negative consequences. Concealment is inversely related to psychological well-being, perceived social support, loneliness, depression, and anxiety (Mereish, Katz-Wise, & Woulfe, 2017; Selvidge, Matthews, & Bridges, 2008; Williams, Mann, & Fredrick, 2017). People who engage in greater concealment have lower emotional support for their sexuality, report more depressive and anxious symptoms, and report greater negativity toward their

sexuality (Schrimshaw, Siegel, Downing Jr., & Parsons, 2013). Concealment not only takes a toll on people but also causes them to miss out on the positive benefits of being out and affiliating with similar others (Crocker & Major, 1989; Frable, Platt, & Hoey, 1998).

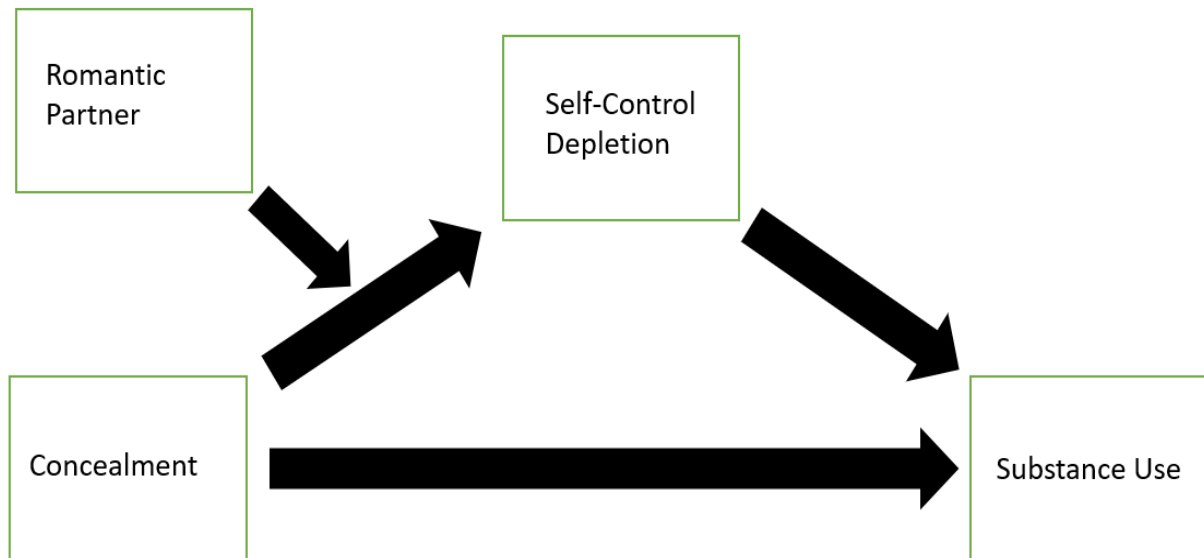


Figure 1. Relationship Buffering Model of Concealment and Substance Use. Identity concealment leads to substance use (path a) through its effect on self-control depletion (paths b and c). However, the existence of a relationship partner buffers against the negative consequences of identity concealment (path d).

Path A: Concealment predicts substance use. Sexual minorities who conceal their sexual identity may turn to drugs and alcohol (Path A). Sexual minorities who conceal their sexual identity are more likely to drink to cope (Lehavot & Simoni, 2011). Also, sexual minorities who are completely concealed, or only out to a few people, are more likely to binge drink than sexual minorities who are more out (Peacock, Andrinopoulos, & Hembling, 2015) Additionally, concealment is significantly related to drug dependence severity (Cortopassi, Starks, Parsons, & Wells, 2017). It is unclear why concealment leads to substance use, but evidence indicates that the association could be due to the added cognitive burden of concealing and managing one's self-presentation through thought suppression, making sexual minorities less able to engage in self-control.

Path B: Concealment predicts self-control depletion. Although research specific to concealment is limited in breadth, it connects to the broader framework of the preoccupation model of secrecy. This model posits that people go through three cyclic steps of keeping a secret - in this case, hiding their sexuality (Lane & Wegner, 1995). First, secrecy leads to thought suppression. Second, thought suppression creates intrusive thoughts. Third, intrusive thoughts lead the individual to engage in more thought suppression, which results in a cycle of thought suppression and intrusive thoughts (Lane & Wegner, 1995). This cycle is difficult to break, and as it continues, the consequences of maintaining the cycle can be detrimental to people's ability to engage in self-control.

Self-control can be defined as the top-down exertion of control of the self by the self (Muraven & Baumeister, 2000). When people's self-control is depleted, they are less able to inhibit maladaptive behavior. Although the status of the "ego depletion" literature is currently in flux (see Friese, Loschelder, Gieseler, Frankenbach, & Inzlicht, 2019), and it

seems unlikely that depletion of glucose (see Gailliot & Baumeister, 2007) can serve as the mechanism for self-control depletion (e.g., Molden et al., 2012), the phenomenon still exists in other literatures (e.g., inhibition or cognitive fatigue; Argyriou, Davison, & Lee, 2017; Persson, Welsh, Jonides, & Reuter-Lorenz, 2007). Therefore, the concept of self-control depletion is used in the current study without speculating about its specific mechanisms.

Concealing sexual identity can be thought of as a form of thought suppression. Individuals manage their thoughts and speech to avoid revealing their sexual identity. Because thought suppression depletes self-control, concealing sexual identity should also deplete self-control (Path B). Indeed, concealing sexual identity has been shown to predict self-control depletion (Hartman et al., 2015). Participants who reveal secrets they are intentionally hiding from others experience more mental fatigue than when they reveal secrets they were not intentionally hiding (Slepian, Halevy, & Galinsky, 2019). Furthermore, managing, suppressing, and concealing sexuality-related stigma is cognitively taxing, and concealment of sexual identity results in self-control depletion (Critcher & Ferguson, 2014). When sexual minorities conceal their sexual identity, they actively deplete their mental resources.

Path C: Self-control depletion predicts substance use. Self-control depletion is related to greater substance use (Path C). For example, people who experience self-control depletion through thought suppression consume more alcohol (Muraven, Collins, & Nienhaus, 2002). Furthermore, on days when people exert more self-control than average, they consume more alcohol (Muraven, Collins, Shiffman, & Paty, 2005). Concealing sexual identity predicts self-control depletion and is associated with increased alcohol use and alcohol-related problems (Hartman et al., 2015). When people experience self-control

depletion for reasons other than concealment, they also consume more alcohol than those who do not experience self-control depletion (Christiansen, Cole, & Field, 2012).

Adolescents who report low trait self-control use more cannabis than adolescents who report higher trait self-control (Otten, Barker, Maughan, Arseneault, & Engels, 2010). Together, these studies suggest that as sexual minorities experience self-control depletion due to concealment and thought suppression, they will be more likely to engage in substance use.

Path D: Relationship Status moderates the association between concealment and self-control depletion. Although concealing one's identity should deplete self-control, having an intimate partner should restore self-control (Path D). People primed with securely attached relationships experience greater energy than those who are not, and this effect is independent of positive affect (Luke, Sedikides, & Carnelley, 2012). Similarly, people primed with family members demonstrate greater self-control than those who are not, controlling for positive affect (Stillman, Tice, Fincham, & Lambert, 2009). Even engaging in "interactions" with faux relationship partners (e.g., characters on a favorite television show or in a favorite book) can restore depleted self-control (Derrick, 2013).

People in intimate relationships use less alcohol, cannabis, and other illicit drugs than those not in a relationship (Fleming, White, & Catalano, 2010; Kamp Dush & Amato, 2005; Miller-Tutzauer, Leonard, & Windle, 1991). Similarly, people who have never been married experience more than twice the number of alcohol use disorders as people who are married or cohabitating (Hasin, Stinson, Ogburn, & Grant, 2008). Intimate relationships' ability to restore self-control might be at least partially responsible for the lower substance use observed among people in relationships.

Overview and Hypotheses

The goals of this study were to show, using an experimental analog, that: 1) identity concealment causes an increase in substance use through its effect on self-control depletion, 2) this effect is diminished in the presence of a partner, and 3) the effect of identity concealment is different from (and more corrosive than) general concealment.

The present study used a 3 (concealment condition: identity concealment vs. general concealment vs. no concealment) X 2 (partner salience: partner salient vs. partner not salient) factorial design. I expected to find a significant two-way Concealment X Partner Salience interaction. When the partner was “absent” (i.e., not salient), I expected participants who concealed their identity (i.e., identity concealment) to experience greater self-control depletion and more “substance use” than participants who kept a secret (i.e., general concealment) or did not conceal. In contrast, when the partner was “present” (i.e., salient), I did not expect to find these differences across concealment conditions. I expected self-control depletion to mediate the association between the Concealment X Relationship Salience interaction and substance use.

Method

Participants and Design

I recruited participants from Amazon’s Mechanical Turk (MTurk), which is a platform for matching requesters to workers. Requesters post tasks, called HITs, that workers complete in exchange for monetary compensation. For example, requesters might post a HIT to review content on a developing website, and in exchange, the worker would be paid 2 dollars for their time. Researchers can use the MTurk platform to recruit study participants in exchange for a nominal fee. This platform is especially useful for studying hard-to-reach populations because MTurk has over 500 thousand workers across different incomes, parts of

the world, minority groups, and more. MTurk provides samples that are more diverse than and just as reliable as average college student samples (Buhrmester, Kwang, & Gosling, 2011; Buhrmester, Talaifar, & Gosling, 2018; Paolacci & Chandler, 2014). Poor sampling techniques inundated early sexual minority research (e.g., recruiting from only gay bars or clinical samples), which would limit the generalizability of findings (Meyer & Wilson, 2009). MTurk provides a platform for recruiting a reasonable sample size that is more representative of the sexual minority population than in prior research and would typically be challenging to obtain in a college undergraduate population.

In the present study, participants were required to be workers on MTurk who were at least 18 years old, self-identified as a sexual minority, and were in a romantic relationship with a person of the same sex for a minimum of 3 months (these qualifications can be set through TurkPrime panels). A total of 357 participants were recruited. Participants were dropped for not completing at least 95% of the study ($n = 104$) and for failing the manipulation check ($n = 15$), leaving a final sample of 238 who were retained for analyses. An initial group of 26 participants (Sample A) were run to ensure the study ran smoothly. The study was planned to last no longer than 25 minutes, but unexpectedly, some participants reported spending between 30-60 minutes to complete the study. Due to financial constraints, questionnaires were shortened to allow participants to complete the study in a reasonable amount of time (see below). Finally, the HRC disclosure scale was shorted from 12 items to five. After these modifications, no participants alerted researchers that the study was taking longer than intended. The remaining 212 participants (Sample B) completed this shortened version of the study.

Participants were paid 2.00 USD in exchange for participation in this 15-minute experiment. This experiment used a 3 (concealment: identity concealment vs. general concealment vs. no concealment) X 2 (partner salience: partner salient vs. partner not salient) MANOVA factorial design. Power was calculated using the Real Statistics Resource Pack software (Release 6.2) (Zaiontz, 2019). I set α at .05, set power at .80, included two factors with a total of six conditions, and included four dependent variables. With a sample size of 300, I would have power to detect an interaction with an effect size as small as $\eta^2 = .018$. In MANOVA analyses, effect sizes of $\eta^2 = .01$ are considered small, $\eta^2 = .06$ are considered medium, and $\eta^2 = .14$ are considered large, so with 300 participants, I would have had sufficient power to detect a small-to-medium interaction effect. With 238 participants, I should have had sufficient power to detect effect an effect size as small $\eta^2 = .03$.

The average age of the sample was 32.29 (SD=9.14, range: 18-70) years. Participants identified predominantly as non-Hispanic White (82.4%), followed by Hispanic (11.7%), Black (8.4%), and Asian/Asian-American (2.9%). Participants primarily held a bachelor's degree (39%), had some post-high school education (31.9%), held a high school degree (16%), or held a masters/MD/Ph.D. (14.7%). Participants identified as female (78%), male (19%), transgender (2%), and genderqueer (2.5%). Most participants reported being bisexual (58.8% overall, 41% of male participants, 64.4% of female participants, 66.7% of genderqueer participants), gay or lesbian (i.e., homosexual; 29.4% overall, 54.3% of male participants, 22.2% of female participants, 80% of transgender participants, 33.3% of genderqueer participants), pansexual (10.5% overall, 4.3% of male participants, 12.2% of female participants, 20% of transgender participants), something else (n = 1 female). Participants were casually dating (3%), exclusively dating (32.4%), nearly engaged (17.6%),

engaged (8%), or married (38.6%). On a scale from 0-4, participants reported moderate disclosure ($M = 1.96$, $SD = 1.12$, range: 0-4).

Procedures

The study took place online through a survey programmed in Qualtrics. Participants read a cover letter informing them that they were participating in a study on lie detection and purchasing styles. Participants were given the impression that they were generating these statements and purchasing styles for another experiment.

Next, participants completed the concealment manipulation based on a previously published concealment paradigm (Critcher & Ferguson 2014). Participants were told that they were to hide one piece of information about themselves when answering a series of questions. The questions included asking about their dating life, wanting kids, and their personal lives. They were asked a total of seven questions in each condition and provided open-ended responses to each question. Participants were told their responses would be given to another participant who would have to determine if they were concealing any information. In reality, there was no other participant, and the goal was to see the effects of concealment on substance use. All participants completed the questions, but participants were given different instructions depending on their assigned concealment condition.

Participants in the *identity concealment condition* (see Appendix A) were instructed to conceal their sexual identity. To induce identity concealment, they were told not to mention their sexuality, the gender of their partner, or write using any pronouns that would reveal their sexuality.

Participants in the *general concealment condition* (see Appendix B) were instructed to conceal information about where they lived. Participants could not reveal if they lived in

more rural or urban areas or the name of the specific place that they lived. The general concealment condition was included as a control condition to disentangle the effects of minority concealment from concealment in general (i.e. keeping a secret).

Participants in the *no concealment condition* (see Appendix C) were not instructed to conceal any information about themselves. The no concealment condition was included as a neutral control condition to examine whether (any type of) concealment would lead to changes in self-control depletion.

Next, participants completed the partner salience reliving essay (see Appendix D). In the *partner salient condition*, participants wrote for three minutes about a positive memory they had of their partner. In the *partner not salient condition*, participants wrote about a recent trip to the grocery store (see Appendix E). The objective of the partner reliving manipulation was to demonstrate, in an experimental analog, that having a partner and relationship can be protective, a novel hypothesis for the sexual minority literature.

Next, as an assessment of participants' self-control depletion (see Derrick, 2013), participants completed the Remote Associates Task (RAT). Participants were given three words that were related to each other and had 15 seconds to generate a fourth related word (Lupien, Seery, & Almonte, 2012; Mcfarlin & Blascovich, 1984). For example, participants saw the words "pig," "ink," and "play." They should have responded with the correct response, "pen." The RAT comes in three varying degrees of difficulty (Lupien et al., 2012). Rather than using the easy version or the hard version, the 12-item medium version was used to minimize the potential for ceiling or floor effects (see Appendix F). This task was given under the guise of being a measure of reasoning ability and creativity. The number of correct

responses was summed ($\alpha=.76$), so that higher scores reflect greater perseverance or lower self-control depletion.

Next, participants completed three purchasing tasks to assess changes in the relative value they assign to alcohol (in standard drinks), cannabis (in joints), and gasoline (in gallons), described in more detail below. I included a gasoline purchasing task to rule out the possibility that concealment merely leads to an increased urge to purchase any commodity, rather than increasing the relative value that participants assign to alcohol and cannabis (Vohs & Faber, 2007). Participants completed each purchasing task separately. The order of the three purchasing tasks was randomized across and within participants to ensure there were no order effects.

Next, participants completed relationship satisfaction, a demographics questionnaire, a procedure check, and a suspicion check. Finally, participants were debriefed on the purpose of the study.

Purchasing Tasks

Participants indicated how much of each commodity they would purchase at varying prices: \$0, \$0.25, \$0.50, \$0.75, \$1, \$1.25, \$1.50, \$1.75, \$2, \$2.50, \$3, \$3.50, \$4, \$4.50, \$5, \$5.50, \$6, \$6.50, \$7, \$8, \$9, \$10 \$15, \$20. For example, participants were asked how many joints of cannabis they would be willing to purchase when the price per gram is 0 dollars. They were also asked how many joints they would be willing to purchase when the price per gram was 1 dollar. All prices were presented in a random order to participants, and each participant was asked how much of the commodity they would buy at each price.

Purchasing tasks improve on traditional self-report measures of substance use by providing a comprehensive analysis of drug motivation and incentive value that goes beyond

typical measures of urge or craving. Furthermore, demand curves provide a cost-benefit analysis by using relative value that reflects decisions made in everyday life. In addition to these benefits, purchasing tasks are different from self-report questionnaires because the participant responses are used to calculate indices that they would not be able to self-report. Demand curves provide four indices of the relative value participants assign to a commodity (or drug): 1) intensity, the amount of the commodity purchased when the commodity is free; 2) breakpoint, the point at which the cost of the commodity drives the purchasing of the commodity to zero; 3) O_{\max} , the maximum amount of money a person will pay for a commodity; and 4) P_{\max} , how much of a price increase a person will accept before their purchasing intentions are affected by costs (Aston, Metrik, & Mackillop, 2015). These tasks are in Appendix G (alcohol), Appendix H (cannabis), and Appendix I (gasoline).

Each index of the purchasing task was calculated within the beezdemand 'R' package (Kaplan, 2019). Beezdemand can check for violations (e.g., unsystematic data and data that does not follow the form of a demand curve) and calculate each index of the purchasing task. There were three specific assumptions that were checked for each commodity: 1) as cost increases, demand should decrease; 2) after demand begins to decrease with rising prices, it should not begin to increase again; and 3) there should not be increases in consumption after participants have reached breakpoint. I dropped participants who violated two out of three of the assumptions, a total of three participants (Stein, Koffarnus, Snider, Quisenberry, & Bickel, 2015).

Self-Report Measures

Self-Esteem. Self-Esteem was measured using two scales. For sample A, self-esteem was measured using the 10-item Rosenberg self-esteem scale (Rosenberg, 1965). Example

items include “on the whole, I am satisfied with myself” and “I take a positive attitude toward myself.” For sample B, a single-item self-esteem measure was used and asked participants to indicate how true the statement “I have high self-esteem” is from 1-5 (Robins, Hendin, & Trzesniewski, 2001). Rosenberg and Robin $\alpha=.90$) Self-Esteem was harmonized by taking the average of the rosenberg self-esteem and the Robins self-esteem scale. Versions A and B of self-esteem can be seen in Appendix J.

Disclosure. Participants in sample A completed the Human Rights Campaign (HRC’s) 12-item measure of disclosure (Watson, Fish, Poteat, & Rathus, 2019). For sample B, the number of disclosure items was reduced to five but retained major areas that best signified being out to participants’ disclosure community. Additionally, these items were used on a rating scale to allow participants to rate their disclosure from 0-100 for each group. The groups retained for sample B were members of participants’ immediate family, extended family, friends and acquaintances, people at work or school, and strangers ($\alpha=.83$). The average of both versions of disclosure was used to compute a single item of disclosure. Versions A and B of disclosure can be seen in Appendix K.

Perceived Partner Responsiveness. Perceived partner Responsiveness was only assessed in sample A and was not calculated or included in analyses. Questions included “My partner listens to me when I need someone to talk to” and “I can state my feelings without him/her getting defensive.” The scale ranged from 1 (Completely Disagree) to 7 (Completely Agree). Version A can be seen in Appendix L.

Relationship Satisfaction. Relationship satisfaction was measured using the Couples Satisfaction Index (Funk & Rogge, 2007). Questions included, “Please indicate the degree of happiness, all things considered, of your relationship” and “I have a warm and comfortable

relationship with my partner.” Questions ranged from “not at all” to “completely” ($\alpha=.90$). This scale is included in Appendix M.

Demographics. Demographics measured age, sex, race, length of the relationship, relationship status, cohabitation, if they own a car, and employment status. Demographics can be seen in Appendix N.

Procedure check. Participants were asked ten questions related to the procedures of the study to ensure they paid attention and correctly followed instructions in Version A. However, in version B participants were only asked 3 questions. Version A and B procedure check questions can be seen in Appendix O.

Suspicion check. Participants were asked three questions related to suspicion in version A. However, in version B this was reduced to one open ended question. These questions were included to ensure that participants were unaware of the purpose of the experiment. Version A and B suspicion check questions can be seen in Appendix P.

Results

Preliminary Analyses

Preliminary data analyses included computing bivariate correlations (Table 1), as well as means and standard deviations for all variables in the current study Table 2.

Violations of Assumptions. There should be no violations of the independence of groups assumption because participants were randomly assigned to condition. To test the linearity of dependent variables, I examined the Pearson r correlation between each pair of dependent variables. None of the variables were correlated greater than $r = .80$, indicating that the dependent variables were not multicollinear. For all outcome variables, I tested for violations of normality, skewness, and kurtosis using the Kolmogorov-Smirnov (KS) test.

This test was not significant for self-control depletion. However, all other tests differed significantly from zero, all p s < .001, indicating that the demand curve outcome variables were skewed. Accordingly, all demand curve outcomes were tested with the Stata command, “ladder,” to determine the best fitting transformation. The ladder command runs eight transformations (following the ladder of powers), along with the original distribution, and uses a chi-square test to compare the transformed distributions to a normal distribution. Transformations with the lowest chi-square value were selected. MANOVAs are generally robust to violations of normality as long as cell sizes are equal. However, cell sizes were not equal, and Box’s M was significant for all outcomes, so Pillai’s trace criterion was used to determine significance in the primary analyses. Finally, outliers were identified within the top 3% of results after being transformed and were trimmed and filled.

Primary Analyses

Self-Control Depletion. Did participants who concealed their sexual orientation (i.e., identity concealment condition) experience greater self-control depletion than those who concealed where they lived (i.e., general concealment condition) or did not conceal anything about themselves (i.e., control condition)? Did writing about (and thus, thinking about) the intimate partner restore self-control? These questions were tested by using a 3 X 2 Analysis of Variance (ANOVA) examining the effects of condition (concealment: identity vs. general vs. control) and partner salience (partner salience: salient vs. not salient) on self-control depletion. Neither the concealment condition main effect nor the partner salience main effect significantly predicted self-control depletion, $F(2, 238) = 0.56, p = .580, \eta^2 = .005$ and $F(1, 238) = 1.62, p = .204, \eta^2 = .007$ respectively. Additionally, the predicted two-way Concealment Condition X Partner Salience interaction was not significant, $F(2, 238) = 0.84,$

$p = .432$, $\eta^2 = .007$. Thus, contrary to hypotheses, there were no group differences on self-control depletion. Furthermore, controlling for any other variables (disclosure, age, satisfaction, and self-esteem) did not affect the results.

Relative Value of Alcohol. Did the alcohol demand curve (i.e., the relative value of alcohol) differ based on concealment condition or partner salience? To test this question, I used a 3 X 2 multivariate analysis of variance (MANOVA) with condition (concealment: identity vs. general vs. control) and partner salience (partner salience: salient vs. not salient) predicting alcohol intensity, breakpoint, Pmax, and Omax. The multivariate main effect of Concealment Condition was not significant, Pillai's trace = .051, $F(8, 460) = 1.51$, $p = .149$ (see Table 3), $\eta_p^2 = .026$. Additionally, the multivariate main effect of partner salience condition was not significant, Pillai's trace = .029, $F(4, 229) = 1.68$, $p = .156$, $\eta_p^2 = .029$. Finally, the predicted multivariate two-way Concealment Condition X Partner Salience interaction was not significant, Pillai's trace = .027, $F(8, 460) = 0.78$, $p = .623$, $\eta_p^2 = .0013$. Furthermore, controlling for any other variables (disclosure, age, satisfaction, and self-esteem) did not affect the results.

Relative Value of Cannabis. Did the cannabis demand curve (i.e., the relative value of cannabis) differ based on concealment condition or partner salience? To test this question, I used a 3 (concealment condition) X 2 (partner salience) MANOVA to predict cannabis intensity, breakpoint, Pmax, and Omax. The multivariate main effect of concealment condition was significant, Pillai's trace = .125, $F(8, 368) = 3.39$, $p < .001$, $\eta_p^2 = .069$. Follow up one-way ANOVAs testing the effect of concealment condition were conducted for each cannabis outcome (see Table 4). When those tests were significant, Scheffé tests ($\alpha = .05$) were used to determine where significant differences occurred.

Cannabis intensity differed significantly by concealment condition $F(2, 368) = 13.23$, $p < .001$, $\eta^2 = .123$. Follow-up tests revealed that cannabis intensity (i.e., the number of joints people would purchase if the cost were \$0) was significantly greater in the identity concealment condition ($M = 50.24$ joints, $SD = 46.23$ joints) than in the general concealment condition ($M = 23.63$ joints, $SD = 35.25$ joints). Cannabis intensity did not differ significantly between the identity concealment condition and the control condition ($M = 38.64$ joints, $SD = 43.34$ joints), nor between the general concealment and control conditions. Cannabis breakpoint did not differ significantly by concealment condition $F(2, 235) = 0.53$, $p = .59$, $\eta^2 = .004$ but cannabis Omax differed significantly by concealment condition $F(2, 235) = 3.42$, $p = .035$, $\eta^2 = .028$. Follow up tests revealed that cannabis Omax (i.e., the total amount of money people spent on joints) was significantly greater in the identity concealment condition ($M = \$56.93$, $SD = \$92.18$) than in the general concealment condition ($M = \$25.78$, $SD = \$51.99$). Cannabis Omax did not differ significantly between the identity concealment condition and the control condition ($M = \$38.00$, $SD = \$76.89$), nor between the general concealment and control conditions. Finally, the effect of condition on Pmax was marginally significant, $F(2, 235) = 3.01$, $p = .051$, $\eta^2 = .025$. Follow up tests revealed that cannabis Pmax (the total amount spent before the number of joints purchased is affected by price) was marginally ($p = .054$) higher in the general concealment condition ($M = \$793.90$, $SD = \$711.48$) than in the identity concealment condition ($M = \$529.67$, $SD = \$582.45$).

The multivariate main effect of partner salience was not significant, Pillai's trace = .009, $F(4, 183) = 0.43$, $p = .786$, $\eta_p^2 = .009$. The predicted multivariate two-way Concealment Condition X Partner Salience interaction also was not significant, Pillai's trace = .028, $F(8,$

368) = 0.64, $p = .742$, $\eta_p^2 = .027$. Furthermore, controlling for any other variables (disclosure, age, satisfaction, and self-esteem) did not affect the results.

Relative Value of Gasoline. I did not expect a significant effect of concealment condition or partner prime on the relative value of gasoline. Again, I used a 3 (concealment condition) X 2 (partner salience) MANOVA to predict gasoline intensity, breakpoint, Pmax, and Omax. Unexpectedly, the multivariate main effect of concealment condition was marginally significant, Pillai's trace = .064, $F(8, 460) = 1.89$, $p = .059$, $\eta_p^2 = .032$ (see Table 5). Follow-up one-way ANOVAs with post hoc Scheffé tests were conducted for each gasoline outcome.

Gasoline intensity differed significantly by concealment condition $F(2, 235) = 4.77$, $p = .009$, $\eta^2 = .039$. Follow-up tests revealed that gasoline intensity (i.e., the number of gallons of gasoline people would buy if a gallon cost \$0) was significantly greater in the identity concealment condition ($M = 52.6$ gallons, $SD = 37.27$ gallons) than in the general concealment condition ($M = 35.54$ gallons, $SD = 33.20$ gallons). Gasoline intensity did not differ significantly between the identity concealment condition and the control condition ($M = 43.20$ gallons, $SD = 37.23$ gallons), nor between the general concealment and control conditions. Gasoline breakpoint, gasoline Omax, and gasoline Pmax did not differ significantly by condition, $F(2, 235) = 0.22$, $p = .806$, $\eta^2 = .002$, $F(2, 235) = 0.72$, $p = .489$, $\eta^2 = .006$, and $F(2, 235) = 0.13$, $p = .876$, $\eta^2 = .001$ respectively.

The multivariate main effect of partner salience was not significant, Pillai's trace = .017, $F(4, 227) = 1.00$, $p = .409$, $\eta_p^2 = .017$. The multivariate two-way Concealment Condition X Partner Salience interaction also was not significant, Pillai's trace = .055, $F(8,$

456) = 1.61, $p = .120$, $\eta_p^2 = .027$. Furthermore, controlling for any other variables (disclosure, age, satisfaction, and self-esteem) did not affect the results.

Exploratory Analyses.

Gender. Exploratory analyses were conducted to see if gender moderated the effects of concealment and partner salience. Specifically, I predicted that sexual minority women would value alcohol more than men, whereas sexual minority men would value cannabis more than sexual minority women. These questions were tested by using a 3 X 2 X 2 MANOVA examining the effects of condition (concealment: identity vs. general vs. control), partner salience (partner salience: salient vs. not salient), and gender (gender: male vs. female) on the relative value of alcohol. There was no multivariate main effect of gender for the relative value of alcohol, Pillai's trace = .069, $F(8, 872) = 0.95$, $p = .511$, $\eta_p^2 = .009$. Contrary to my hypothesis, the multivariate three-way Concealment Condition X Partner Salience X Gender interaction did not significantly predict the relative value of alcohol, Pillai's trace = .055, $F(8,432) = 1.53$, $p = .145$, $\eta_p^2 = .027$. Additionally, there was no multivariate main effect of gender predicting the relative value of cannabis, Pillai's trace = .087, $F(16, 692) = 1.47$, $p = .489$, $\eta_p^2 = .032$. Contrary to my hypothesis, the multivariate three-way Concealment Condition X Partner Salience X Gender interaction was not significant, Pillai's trace = .036, $F(8,342) = 0.77$, $p = .625$, $\eta_p^2 = .018$.

Self-Esteem. Self-esteem was also tested as a potential moderator (note: Stata's MANOVA command can incorporate continuous predictor variables). Do those with lower self-esteem value alcohol and cannabis more than those with higher self-esteem? This question was tested by using a 3 (concealment condition) X 2 (partner salience) X self-esteem MANOVA to predict the relative value of alcohol. The multivariate main effect of

self-esteem did not significantly predict the alcohol outcomes, Pillai's trace = .01, $F(4,223) = .53$, $p = .711$, $\eta_p^2 = .009$. Additionally, the multivariate three-way Concealment Condition X Partner Salience X Self-esteem interaction did not significantly predict the alcohol outcomes, Pillai's trace = .041, $F(8,448) = 1.18$, $p = .311$, $\eta_p^2 = .021$. In a similar 3 (concealment condition) X 2 (partner salience) X self-esteem MANOVA predicting the relative value of cannabis, the multivariate main effect of self-esteem did not significantly predict the cannabis outcomes, Pillai's trace = .036, $F(4,177) = 1.61$, $p = .173$, $\eta_p^2 = .035$. Additionally, the multivariate three-way Concealment Condition X Partner Salience X self-esteem interaction did not significantly predict the relative value of cannabis, Pillai's trace = .026, $F(8,356) = .56$, $p = .811$, $\eta_p^2 = .012$.

Disclosure. Do those who disclose their sexuality to a lesser extent value alcohol and cannabis more than those who have disclosed more? This question was tested by using a 3 (concealment condition) X 2 (partner salience) X disclosure MANOVA to predict the relative value of alcohol. The multivariate main effect of disclosure did not significantly predict the alcohol outcomes, Pillai's trace = .010, $F(4,223) = .54$, $p = .706$, $\eta_p^2 = .01$. Additionally, the multivariate three-way Concealment Condition X Partner Prime X Disclosure interaction predicting the alcohol outcomes was not significant, Pillai's trace = .032, $F(8, 448) = .90$, $p = .514$, $\eta_p^2 = .016$. In a similar 3 (concealment condition) X 2 (partner salience) X self-esteem MANOVA predicting the relative value of cannabis, the multivariate main effect of disclosure did not significantly predict the cannabis outcomes, Pillai's trace = .050, $F(4, 177) = 2.35$, $p = .056$, $\eta_p^2 = .074$. Additionally, the multivariate three-way interaction of Concealment Condition X Partner Salience X Disclosure predicting the relative value of cannabis was not significant, Pillai's trace = .010, $F(8, 356) = .24$, $p = .98$, $\eta_p^2 = .005$.

Discussion

This study examined whether concealment leads to substance use through self-control depletion and if this effect is greater for those concealing their sexuality than for those who only hide a secret. Additionally, this study sought to test if writing about a partner would reduce the impact of concealment. Participants were randomly assigned to conceal their sexual orientation (identity concealment), to conceal where they lived (general concealment), or not to conceal any information about themselves (control). Next, participants either wrote about their intimate relationship or a recent trip to the grocery store. I hypothesized that participants would experience greater self-control depletion and would value substances more after concealing their sexuality than after keeping a secret or not concealing anything. Moreover, I expected that writing about a romantic partner would reduce self-control depletion and substance-valuing. The findings from the primary analyses only partially supported the hypotheses.

Unexpectedly, there were no significant effects of the partner salience manipulation throughout the study. There are at least two possible explanations for these null effects, one involving a possible problem with the partner salient essay and one involving a possible problem with the partner-not-salient essay. First, there could have been an unanticipated carryover effect from the identity concealment condition to the partner salient condition. Specifically, after participants concealed their sexuality in the identity concealment condition, they could have been more stressed (rather than less stressed) by the incongruity of subsequently writing about their partner. This incongruity would not have been apparent for participants who wrote about their partner after completing the general concealment condition or the control (no concealment) condition, thus wiping out the anticipated

interaction with partner salience. Second, there could have been an issue with using a grocery store essay as a neutral writing task for the partner-not-salient condition. If participants experienced increased subjective self-awareness following the concealment conditions (Silvia & Duval, 2001; Wicklund, 1975), and therefore, used the grocery store essay to move attention away from the self, they might have experienced less self-control depletion and subsequently been less interested in substance use. In other words, participants might have benefited just as much by writing about the grocery store as they would have benefited by writing about their partner, again wiping out any potential effects of partner salience.

Additionally, there was no effect of concealment condition on self-control depletion. It could be the case that self-control was not required for the manipulation. If self-control was not required, then self-control would not have been depleted by the concealment conditions, and no restoration would have occurred from the partner salience condition. Sexual minorities may practice concealing their sexuality so much that it is no longer depleting, and they may habituate to a single exposure of concealment (Critcher & Ferguson, 2014). This concealment manipulation has been used previously and was successful at inducing self-control depletion (Critcher & Ferguson, 2014). However, the original study took place in person, and the effects of self-control depletion might not be as strong online. Alternatively, it is possible that the outcome measure of self-control depletion was not sufficiently sensitive. This outcome measure has been used previously (Derrick, 2013), but it is possible that this sample differed in important ways from the sample of that previous study.

Unexpectedly, there was no effect of concealment condition on the relative value of alcohol. Previous literature has shown that alcohol is used at higher rates among sexual

minorities, and that alcohol use is much higher among sexual minority women in particular (Coulter et al., 2018; Parnes et al., 2017). It could be the case that the participants selected for this study did not engage in alcohol use and thus did not use alcohol as a method of coping. Alternatively, the concealment manipulation might not have induced enough stress to cause drinking to cope. The threshold to activate drinking to cope could be greater than the threshold for spending money or using cannabis. Alcohol is associated with multiple side effects, such as feeling sick, dizziness, hangovers, and headaches, and therefore, might require greater stress to justify risking such consequences (Wiese, Shlipak, & Browner, 2000).

Participants valued cannabis more on two out of the four demand curve indices, intensity and Omax, after concealing their sexuality than after keeping a secret. Intensity is most similar to craving for a commodity because it is the amount consumed when the commodity is free. Participants indicated that they would use more cannabis when it was free after concealing their sexuality than after keeping a secret. Omax is the total amount of money participants spent on a commodity. In this case, participants who concealed their sexuality spent more money overall on cannabis than participants who kept a secret. Finally, there was one (marginal) effect that was in the opposite direction than expected. Participants who kept a secret had marginally higher Pmax scores than those who concealed their sexuality. Pmax is the total amount spent before the demand for cannabis is affected by the price. However, this was a marginally significant effect with a marginally significant follow-up test. Additionally, the effect size was very small ($\eta^2 = .025$) in comparison to the effect size for cannabis intensity ($\eta^2 = .123$) or the effect size for cannabis Omax ($\eta^2 = .028$). Therefore, overall, it appears that concealing sexuality had a more detrimental effect on

marijuana consumption than keeping a secret in the present study. These findings support previous correlational studies indicating that sexual minorities who conceal their sexuality are more likely to engage in substance use (Cortopassi et al., 2017; Peacock et al., 2015).

Although I did not predict an effect on gasoline, there was a marginally significant main effect of concealment condition. In this case, only one of the four demand curve indices, intensity, was significant. Participants indicated they would obtain more gasoline when it was free after they concealed their sexuality than after they kept a secret. This finding was unexpected, in that there is no physiological or mental benefit to buying gasoline. However, it could be the case that buying gasoline could be seen as a form of coping with stress, aka stress shopping, which has been shown to alleviate stress (Hama, 2001). An alternative explanation could be that concealment manipulation might have led people to feel uncomfortably self-aware, and therefore, they might have wanted to focus on something other than themselves. Thus, people might have been happy to purchase greater quantities of gasoline as a result of the condition because this enabled them to direct their attention away from concealing their sexuality and towards any kind of shopping. This would have caused a weaker effect to appear for alcohol as well as cannabis. However, the effect size for cannabis intensity ($\eta^2 = .123$, a medium-to-large effect) was larger than the effect size for gasoline intensity ($\eta^2 = .039$, a small effect). Thus, it seems that the effects of concealing sexuality are not specific to cannabis, although the effects on cannabis were stronger than the effects for gasoline.

The findings for cannabis and gasoline provide weak support that concealing sexuality is more stressful than keeping a secret. In a single exposure to concealing sexuality, sexual minorities were at greater risk for engaging in substance use or buying gasoline to

cope with stress (Cooper, Frone, Russell, & Mudar, 1995; Kuntsche, Knibbe, Gmel, & Engels, 2005; Simons, Correia, Carey, & Borsari, 1998). Even though the intention to obtain gasoline was greater after concealing sexuality, participants could have experienced a greater desire to purchase items to make themselves feel better (Hama, 2001; Vohs & Faber, 2007).

Neither participants in the identity concealment condition nor participants in the general concealment condition showed significantly different responses from participants in the control condition across the demand curve indices. For both cannabis and gasoline, means for the control condition regularly fell in-between the means for the identity concealment and general concealment conditions. A possible reason why this occurred is that the control condition might not have been entirely neutral. On average, participants reported concealing their sexuality from approximately half of the people in their lives. In the control condition, participants were told to respond to the questions “naturally and honestly.” Thus, if participants were not completely out, they might have concealed their sexuality in the control condition because they are already concealing their sexuality in their daily life. Therefore, the control condition might not have represented being out and open about their sexuality.

Limitations and Strengths

The study had at least three limitations. First, there was no manipulation check for the partner salience manipulation. The partner salience manipulation did not have a significant effect on any outcome, but without a manipulation check, it is difficult to interpret these null effects. Second, it is difficult to induce the intimate feeling of identity concealment through an online manipulation. An in-person study would likely have stronger effects. Finally, I was unable to collect the planned sample size. Power analyses previously showed that 300

participants would be required to find a small-to-medium effect size. Due to difficulty recruiting sexual minority participants in a relationship, data collection was stopped before reaching the targeted sample size despite several months of recruiting.

Despite these weaknesses, the study also had several strengths. First, the concealment manipulation differentiated between concealing sexuality and keeping a secret. While many correlational studies have indicated that concealing sexuality is detrimental, it has been unclear whether this effect is different from merely keeping a secret. Participants valued cannabis and gasoline more when concealing their sexuality than when concealing where they lived. Thus, although effects for the “neutral” control condition were unclear, there were clear differences between identity concealment and general concealment.

Second, the study was designed to test if concealment led solely to substance use or, more broadly, induced people to cope by spending more money. This is the first time that purchasing tasks have been used to examine possible increases in the overall desire to spend money. Spending money has been shown to be a way of coping with stress and a response to a depleted state of self-control (Hama, 2001; Vohs & Faber, 2007). Results of the study suggest that this was a legitimate concern because concealment of sexuality did cause an increased desire to spend money on gasoline, a commodity that has no associated physical or mental coping associations. Furthermore, in additional analyses (not presented) that included gasoline intensity as a covariate to ensure that cannabis intensity was not merely an artifact of desire to spend, the effect on cannabis intensity remained significant. Importantly this result illustrates the need to ensure that demand curve purchasing tasks do not merely play on people’s desire to cope with stress by spending money. A second possibility is that people were trying to decrease subjective self-awareness by purchasing more gasoline (Silvia &

Duval, 2001). More specifically, people were made self-aware of concealing their sexuality from the concealment condition, then they felt the desire to redirect their awareness from the self-towards “spending” gasoline.

Third, this study included a unique and hard-to-reach sample. Sexual minorities are a difficult population to recruit because they only make up about 5% of the US population (Gates, 2011), and finding those involved in intimate relationships is even more difficult. There exists a plethora of research on intimate relationships among heterosexual couples, but only more recently have sexual minority relationships been studied (but see Larry Kurdek’s groundbreaking work, e.g., Kurdek, 1988, 1991, 2006). More specifically, the sample had a diverse array of sexualities and genders. A large proportion of the sample identify as bisexual, as well as was made up of those who identified as gay, lesbian, genderqueer, transgender men, and transgender women. The sample also had a distribution of people that were on average disclosed to only half of the individuals in their lives, better representing the experiences and lives of sexual and gender minorities. Furthermore, experimental research on intimate relationships within sexual minorities is almost nonexistent. This study helps to shed light on a subset of an already understudied population.

Implications and Future Directions

This study begins to better elucidate the cognitive process and behavioral outcomes that result from sexual minorities having to conceal their sexuality. Self-control depletion did not seem to be a mechanism by which sexual minorities who are concealing their sexuality engage in substance use. However, there does seem to be a process, perhaps a coping mechanism, that bridges the concealment of sexuality to substance use. Future work should utilize the depletion task in-person, similar to the methods used in Critcher & Ferguson

(2014). More specifically, if recruiting through MTurk, using Zoom or other online videoconferencing applications could be a viable option to ensure participants are immersed in the study. For example, participants could engage in a conversation in which they were required to conceal their identity, which would likely require much greater control over their thoughts than a writing task. Indeed self-control depletion has been demonstrated to occur in online tasks (Burger, Charness, & Lynham, 2011), but it is possible the concealment paradigm did not produce self-control depletion because participants have the ability to go back and change their words if they accidentally reveal their sexuality. Writing in an online task does not necessitate the same level of control because there are no repercussions, thus participants' cognitive management is not equivalent to what it would be during an in-person task. Future work should use an in-lab setting to better measure self-control depletion, perhaps through a handgrip task. Similarly, an in-lab setting would be required for other behavioral outcomes, such as an alcohol taste test paradigm in place of the purchasing task.

Additionally, the manipulation to induce positive feelings about one's partner may need to be stronger. Future research could attempt to manipulate relationship satisfaction, rather than relationship salience. Such a manipulation might be a better representation of the beneficial or detrimental effects of being in a relationship. Indeed, the goal of the task was to remind participants of their intimate relationship (Banse, 1999; Bartz & Lydon, 2004). However, the manipulation used in this experiment was not previously tested. Instead, a manipulation of relationship satisfaction would be more effective. To alter participants' perception of their relationship satisfaction would be more effective for restoring self-control. Future work should aim to induce positive and negative feelings towards one's partner to see if restoration of self-control occurs.

Although self-control depletion did not appear to mediate concealment and substance use in this study, it could be that the manipulations failed to induce self-control depletion as described above. The concealment manipulation did not necessitate effortful control because the manipulations allowed participants to correct any errors and did not come with any costs to failing to conceal sexuality. Additionally, the partner manipulations were untested and did not have a manipulation check to ensure that the goal of the manipulation occurred.

Additionally, other cognitive mechanisms could explain substance use among sexual minorities concealing their sexuality. Potential explanations could be that being closeted causes increased negative coping norms. Indeed sexual minorities have been shown to hold greater norms towards alcohol use after a large discriminatory event (Boyle, Labrie, & Witkovic, 2016) or cannabis expectancies for the numbing effects of cannabis and alcohol (Walch, Ngamake, Bovornusvakool, & Walker, 2016).

Conclusions

Concealment is a process of survival for many sexual minorities, but survival can come at a cost. The results of the present study suggest that sexual minorities are at greater risk for cannabis use when concealing their sexuality. These findings indicate the need to support sexual minorities to be open about their sexuality to reduce their risk of substance use. Developing programs to give sexual minorities opportunities to feel supported for their sexuality and aid them in coming out to their friends and family could prevent the development of problematic substance use.

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Table 1. Correlation table for all outcomes and continuous predictors.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---------------------------|--------|-------|--------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| 1. Self-Esteem | | | | | | | | | | | | | | |
| 2. Disclosure | .207* | | | | | | | | | | | | | |
| 3. Self-Control Depletion | -.060 | .069 | | | | | | | | | | | | |
| 4. Alcohol Intensity | -.056 | .058 | .006 | | | | | | | | | | | |
| 5. Alcohol Breakpoint | .020 | -.031 | -.031 | .119 | | | | | | | | | | |
| 6. Alcohol Omax | -.005 | .069 | .014 | .475* | .554* | | | | | | | | | |
| 7. Alcohol Pmax | .043 | .006 | -.050 | -.049 | .707* | .330* | | | | | | | | |
| 8. Cannabis Intensity | .016 | .143 | .010 | .270* | -.177* | .1030 | -.069 | | | | | | | |
| 9. Cannabis Breakpoint | -.068 | .135 | -.330* | .122 | .142 | .145 | .225 | .097 | | | | | | |
| 10. Cannabis Omax | .049 | .111 | -.070 | .067 | .112 | .145* | .008 | .491* | .347* | | | | | |
| 11. Cannabis Pmax | -.133* | -.042 | -.065 | .084 | .382* | .313* | .458 | .006 | .630* | .099 | | | | |
| 12. Gasoline Intensity | .076 | -.020 | -.037 | .068 | -.172* | .074 | -.075 | .285* | .017 | .242* | -.066 | | | |
| 13. Gasoline Breakpoint | .079 | .034 | .036 | .169 | .004 | -.010 | .038 | .131 | .244 | .035 | .025 | -.005 | | |
| 14. Gasoline Omax | .039 | -.044 | -.010 | .062 | -.020 | .181 | -.102* | .004 | .026 | .124* | .041 | .256* | .068 | |
| 15. Gasoline Pmax | -.052 | .010 | .017 | .114 | .211* | .140 | .230* | -.055 | .165 | .009 | .237* | .052 | .449* | .228* |

Note. Intensity = the amount of the commodity purchased when the commodity is free; Breakpoint = the point at which the cost of the commodity drives the purchasing of the commodity to zero; Omax = , the maximum amount of money a person will pay for a commodity; Pmax = how much of a price increase a person will accept before their purchasing intentions are affected by costs.

*p<.05

Table 2. Means and standard deviations of all outcomes and continuous predictors.

| | Identity M (SD) | General M (SD) | Control M (SD) | Overall M (SD) |
|------------------------|--------------------|-------------------|--------------------|--------------------|
| Self-Esteem | 3.15 (1.24) | 3.39 (1.25) | 2.94 (1.33) | 3.16 (1.28) |
| Disclosure | 1.93 (1.13) | 1.98 (1.17) | 1.96 (1.05) | 1.96 (1.11) |
| Self-Control Depletion | 6.45 (2.76) | 6.74 (2.84) | 1.96 (1.05) | 6.71 (2.77) |
| Alcohol | | | | |
| Intensity | 15.23 (28.33) | 11.89 (22.88) | 14.89 (26.85) | 13.96 (25.98) |
| Breakpoint | 1019.81 (563.05) | 1246.67 (590.20) | 1084.30 (605.43) | 1111.88 (588.62) |
| Omax | 1635.33 (1481.14) | 2142.63 (3169.42) | 1693.83 (1414.68) | 1830.04 (2201.33) |
| Pmax | 706.67 (582.77) | 900.61 (645.71) | 787.04 (697.58) | 800.84 (647.39) |
| Cannabis | | | | |
| Intensity | 50.24 (46.23) | 23.63 (35.25) | 38.64 (43.34) | 37.13 (42.95) |
| Breakpoint | 1136.29 (703.32) | 1005.71 (625.03) | 1090.83 (654.77) | 1074.48 (655.72) |
| Omax | 6266.67 (12130.28) | 2578.05 (5199.33) | 5800.37 (22858.45) | 4837.10 (15306.42) |
| Pmax | 529.67 (582.45) | 793.90 (711.48) | 697.84 (728.83) | 677.94 (685.55) |
| Gasoline | | | | |
| Intensity | 52.60 (37.27) | 35.53 (33.20) | 43.20 (37.23) | 43.52 (36.42) |
| Breakpoint | 1022.22 (597.00) | 1012.12 (612.63) | 950.00 (567.39) | 993.47 (586.97) |
| Omax | 5299.33 (3650.96) | 6710.37 (7082.77) | 8911.11 (22439.92) | 7014.71 (13909.50) |
| Pmax | 768.67 (737.22) | 767.07 (690.38) | 730.86 (687.55) | 755.25 (701.76) |

Note. Intensity = the amount of the commodity purchased when the commodity is free; Breakpoint = the point at which the cost of the commodity drives the purchasing of the commodity to zero; Omax = , the maximum amount of money a person will pay for a commodity; Pmax = how much of a price increase a person will accept before their purchasing intentions are affected by costs.

Table 3. MANOVA outcomes for alcohol demand curve indices.

| Independent Variable | Pillai's Trace | DF | F-Ratio | P-Value | η_p^2 |
|------------------------------|----------------|--------|---------|---------|------------|
| Condition | .051 | 8, 458 | 1.59 | .149 | .026 |
| Partner Salience | .029 | 4, 229 | 1.49 | .156 | .029 |
| Condition X Partner Salience | .027 | 8, 460 | 0.92 | .623 | .0013 |

Table 4. MANOVA outcomes for cannabis demand curve indices.

| Independent Variable | Pillai's Trace | DF | F-Ratio | P-value | η_p^2 |
|------------------------------|----------------|--------|---------|---------|------------|
| Condition | .137 | 8, 368 | 3.39 | .000 | .069 |
| Partner Saliency | .009 | 4, 183 | 0.43 | .786 | .009 |
| Condition X Partner Saliency | .028 | 8, 368 | 0.64 | .742 | .027 |

Table 5. MANOVA outcomes for gasoline demand curve indices.

| Independent Variable | Pillai's Trace | DF | F-Ratio | P-Value | η_p^2 |
|------------------------------|----------------|--------|---------|---------|------------|
| Condition | .064 | 8, 460 | 1.89 | .059 | .032 |
| Partner Saliency | .015 | 4, 229 | 0.90 | .467 | .017 |
| Condition X Partner Saliency | .048 | 8, 460 | 1.42 | .185 | .027 |

Appendix A

Identity Concealment Questions

Instructions: We want you to hide one piece of information about yourself: your sexual orientation. In other words, if you refer to a date or a significant other, real or hypothetical, you cannot use a word that would reveal the person's gender. So, for example, instead of saying "I tend to date men who ...," you could say, "I tend to date people who" Instead of saying, "One time my girlfriend and I ...," you could say, "One time my significant other and I" We are interested to what extent another participant will be able to tell you are lying from what you write. Because you do not want to arouse suspicions in the other participant, please do your best to write naturally, and make sure you do not slip up.

1. What is most different between your life at work and your life outside of work?
2. If you were a parent, what sorts of restrictions would you put on your child in terms of their dating life?
3. Compared to most people, how frequently do you go out with your friends or, if relevant, your significant other?
4. As you look into your future, how much of a challenge do you think it will be to strike a balance between your work life and your relationship life?
5. Would you be open to adopting children? Why or why not?
6. What sort of activities do you like to do on a first date?
7. Think of your ideal dating partner. In what sorts of domains do you think that you would want the two of you to be similar? In what sorts of ways do you think it would benefit you to be different?

Appendix B

General Concealment Questions

Instructions: We want you to hide one piece of information about yourself: your city or rural area, specifically any indicators of your urban living area. In other words, if you refer to a date or what you do in your spare time, real or hypothetical, you cannot use a word that would reveal your living area. So, for example, instead of saying “I like to shop with friends at downtown Manhattan ...,” you could say, “I like to shop with friends at my favorite stores...” Instead of saying, “My girlfriend and I sell our crops in the city three hours away...,” you could say, “My girlfriend and I travel to sell our crops at a faraway market...” We are interested to what extent another participant will be able to tell you are lying from what you write. Because you do not want to arouse suspicions in the other participant, please do your best to write naturally, and make sure you do not slip up.

1. What is most different between your life at work and your life outside of work?
2. If you were a parent, what sorts of restrictions would you put on your child in terms of their dating life?
3. Compared to most people, how frequently do you go out with your friends or, if relevant, your significant other?
4. As you look into your future, how much of a challenge do you think it will be to strike a balance between your work life and your relationship life?
5. Would you be open to adopting children? Why or why not?
6. What sort of activities do you like to do on a first date?
7. Think of your ideal dating partner. In what sorts of domains do you think that you would want the two of you to be similar? In what sorts of ways do you think it would benefit you to be different?

Appendix C

Control Concealment Questions

Instructions: We want you to answer the following questions as honestly as possible. We are interested to what extent another participant will be able to tell you are telling the truth from what you write. Because you do not want to arouse suspicions in the other participant, please do your best to write naturally and honestly.

1. What is most different between your life at work and your life outside of work?
2. If you were a parent, what sorts of restrictions would you put on your child in terms of their dating life?
3. Compared to most people, how frequently do you go out with your friends or, if relevant, your significant other?
4. As you look into your future, how much of a challenge do you think it will be to strike a balance between your work life and your relationship life?
5. Would you be open to adopting children? Why or why not?
6. What sort of activities do you like to do on a first date?
7. Think of your ideal dating partner. In what sorts of domains do you think that you would want the two of you to be similar? In what sorts of ways do you think it would benefit you to be different?

Appendix D

Partner Salience

Partner Salience Writing task (partner salient): “Write about the last positive interaction you had with your current romantic partner. For example, you could write about things like how much fun you had spending time together or something nice that your partner did for you. The specific topic is up to you, as long as you write about a positive experience that made you feel close to your partner. Please describe this experience in as much detail as possible. You will be given three minutes to write. The study will not progress until after three minutes have passed.”

Appendix E

Grocery Writing Task

Instructions: Write about a recent trip to the grocery store. For example, you could write about things like how you choose which grocery store to go to or the selection of items you chose to purchase. The specific topic is up to you, as long as you write about a recent trip to the grocery store. Please describe this experience in as much detail as possible. You will be given three minutes to write. The study will not progress until after three minutes have passed.

Appendix F

Remote Associates Test

Instructions: You are about to take the Remote Associates Test. This test is valuable because it measures aspects of reasoning ability that are used to find important connections between events and ideas, which leads to the generation of new thoughts and ideas.

This test is made up of 12 items. Each item will appear on the screen for 15 seconds. You will be presented with a number of three-word-groups from which you will need to generate the single word that links all three words together. In this example, the following prompt words appear on the screen: sea, home, and stomach. The single word that links these three words together is “sick”, as in “seasick”, “homesick”, and “sick to your stomach”. For this example, you would say the word type the word “sick” Sometimes the answer goes with prompt words to form a phrase, like “seasick” and “homesick”. However, sometimes the answer is only conceptually linked to prompt words, like in “sick to your stomach”. The test item may include either or both kinds of these relationships. Once the test starts, you will have only 15 seconds to answer each of the 12 items. Once the 15 seconds have passed, the computer will automatically move on to the next item. You cannot go back, and you must respond before the 15 seconds are up. Before the computer moves on to the next item, it will briefly show the words “next item” displayed in red in the middle of the screen.

In the next example, the following prompt words appear on the screen” milk, farm, and bell. The correct answer is “cow”. “Milk comes from cows, cows live on “farm(s)” and a cow “bell” is a type of bell. Answers can be related to prompt words in many different ways as can be seen in this example.

Medium:

1. pig/ink/play = pen
2. skate/poster/game = board
3. silly/mother/feather = goose
4. head/street/dark = light
5. widow/bite/monkey = spider
6. neck/glass/soda = bottle
7. red/go/sign = stop
8. car/swimming/cue = pool
9. surprise/line/birthday = party
10. soap/shoe/tissue = box
11. keel/river/row = boat
12. athletes/web/rabbit = foot

Appendix G

Alcohol Purchasing Task

Imagine that you are at a liquor store RIGHT NOW. The following questions ask how many drinks you would consume if they cost various amounts of money. The available drinks are standard size domestic beer (12 oz.), wine (5 oz.), shots of hard liquor (1.5 oz.), or mixed drinks containing one shot of liquor. Assume that you did not drink alcohol before you are making these decisions and will not have an opportunity to drink or buy alcohol elsewhere after making these decisions. You may use decimal points when entering how many drinks you would buy.

Enter 1 check question “for this question please enter the number one-hundred”

Appendix H

Marijuana Purchasing Task

Imagine that you are at a dispensary RIGHT NOW. The following questions ask how many joints you would buy if they cost various amounts of money. You are taking hits from a standard joint (1 gram of marijuana). Assume that you did not smoke before you are making these decisions and will not have an opportunity to buy marijuana elsewhere after making these decisions. You may use decimal points when entering how many joints you would buy.

. \$0 (free), \$0.25, \$0.50, \$1.00, \$1.50, \$2.00, \$2.50, \$3.00, \$4.00, \$5.00, \$6.00, \$7.00, \$8.00, \$9.00, \$10, \$15, \$20

Enter 1 check question “for this question please enter the number fifty-two”

Appendix I

Gasoline Purchasing Task

Imagine that you are at a gas pump RIGHT NOW. The following questions ask how many gallons of gas you would buy if they cost various amounts of money. The available gasoline is in gallons of gas only. Assume that you did not have any gasoline before you are making these decisions and will not have an opportunity to purchase gasoline elsewhere after making these decisions. You may use decimal points when entering how many gallons you would buy.

\$0 (free), \$0.25, \$0.50, \$1.00, \$1.50, \$2.00, \$2.50, \$3.00, \$4.00, \$5.00, \$6.00, \$7.00, \$8.00, \$9.00, \$10, \$15, \$20

Enter 1 check question “for this question please enter the number twenty-seven”

Appendix J

Self-Esteem

| | | | | | | |
|-------------------|----------|-------------------|---------|----------------|-------|----------------|
| Strongly Disagree | Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Version A

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

| | | | | |
|---------------------|-----------------------|------------------------|---------------------|-----------------|
| Not very true of me | Somewhat Untrue of Me | Neither True or Untrue | Somewhat True of Me | Very True of Me |
| 1 | 2 | 3 | 4 | 5 |

Version B

- 1) I have high self esteem

Appendix K

Disclosure**Version A**

Instructions: For each of the following groups, how many people currently do you think know of your sexual orientation? If you don't have any people who fall into the listed category in your life then please select N/A.

| All | Most | Some | A few | None | N/A |
|-----|------|------|-------|------|-----|
|-----|------|------|-------|------|-----|

- 1) Parents/Guardians
- 2) Siblings
- 3) Grandparents and Extended Family
- 4) LGBTQ Friends
- 5) Non-LGBTQ friends
- 6) Classmates at school
- 7) Co-Workers
- 8) Teachers and adults at school
- 9) Athletic Coaches
- 10) Religious community
- 11) Strangers and new acquaintances
- 12) Doctors and other healthcare providers

Version B

Among the groups of people below, please estimate the percentage of them that you have or would disclose your sexual orientation to.

- 1) Members of your immediate Family
- 2) Members of your extended Family
- 3) People you socialize with
- 4) People at your work/School
- 5) Strangers

Appendix L

Perceived Partner Responsiveness

| | | | | | | |
|--------------------------------|--|--|---------------------------|--|--|-----------------------------|
| Completely Disagree | | | Agree Somewhat | | | Completely Agree |
|--------------------------------|--|--|---------------------------|--|--|-----------------------------|

- 1) My partner listens to me when I need someone to talk to.
- 2) I can state my feelings without him/him getting defensive.
- 3) I often feel distant from my partner.
- 4) My partner can really understand my hurts and joys.
- 5) I feel neglected at times by my partner.
- 6) I sometimes feel lonely when we're together.

Appendix M

Couple Satisfaction Index

1) Please indicate the degree of happiness, all things considered, of your relationship.

Extremely unhappy

Fairly unhappy

A little unhappy

Happy

Very happy

Extremely Happy

2) I have a warm and comfortable relationship with my partner.

Not at all true

A little true

Somewhat true

Mostly true

Almost completely true

Completely true

3) How rewarding is your relationship with your partner?

Not at all

A little

Somewhat

Mostly

Almost

Completely

4) In general, how satisfied are you with your relationship?

Not at all

A little

Somewhat

Mostly

Almost

Compeletely

Appendix N

Demographic Information

1. What is your age (0-99)?

2. What is your sex?

- Male
- Female
- Other

3. Which categories describe you?

1. White

- Ethnicity (e.g., German, Italian, Irish, Polish, English, French, Hispanic, Latino, or Spanish): _____

2. Hispanic, Latino, or Spanish

- Ethnicity (e.g., Mexican or Mexican American, Salvadoran, Puerto Rican, Dominican, Cuban, or Colombian): _____

3. Black or African American

- Ethnicity (e.g., African American, Nigerian, Jamaican, Ethiopian, Haitian, or Somali): _____

4. Asian

- Ethnicity (e.g., Chinese, Vietnamese, Filipino, Korean, Asian Indian, or Japanese): _____

5. American Indian or Alaska Native

- Ethnicity (e.g., American Indian, Alaska Native, Central or South American Indian): _____

6. Middle Eastern or North African

- Ethnicity (e.g., Lebanese, Syrian, Iranian, Moroccan, Egyptian, Algerian): _____

7. Native Hawaiian or Other Pacific Islander

- Ethnicity (e.g., Native Hawaiian, Tongan, Samoan, Figian, Chamorro, Marshallese): _____

8. Some Other Race, Ethnicity, or Origin: _____
4. How long have you been in your current romantic relationship?
- Months (0-11)
 - Years (0-99)
5. What is your current relationship status?
- Casually dating (i.e., not exclusive)
 - Exclusively dating
 - Nearly engaged
 - Engaged
 - Married
7. Are you currently living with your romantic partner?
- a. (Yes/No)
8. What is your highest level of education
- a. Open Ended
9. How do you identify your sexual orientation?
- a. Open Ended
10. How would you describe your current employment status?
- Work full time (35 hours per week or more)
 - Work part time
 - Not currently working
 - Other _____

Appendix O

Procedure Check**Version A**

1. During the study, what were you asked to write about? Please describe:
 - a. Open-ended response
2. During the study, you were asked some interview questions, what were you asked about? Please describe:
 - a. Open-ended response
3. At any point in the study, did you conceal your sexuality? Please describe how this made you feel
 - a. Open-ended response
4. At any point in the study, did you conceal your socioeconomic status? Please describe how this made you feel
 - a. Open-ended response
5. During the study, you were asked to write for three minutes. Please describe what you wrote about:
 - a. Open-ended response
6. During the study, what were you asked to write about?
 - a. Your day
 - b. Your intimate relationship
 - c. Your family history
 - d. A recent trip to the grocery store
 - e. Your political views
 - f. Your spending habits
7. When writing your essay, did you write about your partner?
 - a. Yes
 - b. No
8. Please select each topic you were asked about during the interview:
 - a. Your work-life balance
 - b. Adoption
 - c. Your qualifications for the job
 - d. What you like to do on a first date
 - e. What letters of recommendation would say about you
 - f. How often you drink with colleagues
9. Which of these was the highest price of the items you were asked about?
 - a. 5 dollars
 - b. 10 dollars
 - c. 15 dollars
 - d. 20 dollars
 - e. 25 dollars

10. Please select all the items you were asked to purchase:
 - a. Alcoholic drinks
 - b. Cigarettes
 - c. Gallon of gasoline
 - d. Marijuana
 - e. Gallons of milk
 - f. Lottery tickets

Version B

1. During the study, what were you asked to write about? Please describe:
 - g. Open-ended response
2. When writing your essay, did you write about your partner?
 - a. Yes
 - b. No
3. Please select each topic you were asked about during the interview:
 - a. Your work-life balance
 - b. Adoption
 - c. Your qualifications for the job
 - d. What you like to do on a first date
 - e. What letters of recommendation would say about you
 - f. How often you drink with colleagues
4. Please select all the items you were asked to purchase:
 - a. Alcoholic drinks
 - b. Cigarettes
 - c. Gallon of gasoline
 - d. Marijuana
 - e. Gallons of milk
 - f. Lottery tickets

Appendix P

Suspicion Check

Version A

1. Please briefly describe what you think this study is about.
 - a. Open-ended response
2. Was there anything odd that you noticed during the study?
 - a. Open-ended response
3. Why do you think you were asked about the prices of the items we provided?
 - a. Open-ended response

Version B

1. Please briefly describe what you think this study is about.
 - a. Open-ended response