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# Identity-Specific Positive Psychology Intervention for Sexual Minorities: A Randomized Control Trial

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Identity-Specific Positive Psychology Intervention for Sexual Minorities: A Randomized Control

Trial

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ABSTRACT

Identity-Specific Positive Psychology Intervention for Sexual Minorities: A Randomized Control

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Sarah Job

Sexual minorities experience mental and physical health disparities in comparison to

heterosexual individuals due to minority stress (Branstrom et al., 2016; Kerridge et al., 2017;

Meyer, 2003). Positive psychology interventions have improved mental and physical health

(Antoine et al., 2018; Lambert D'raven et al., 2015), and therefore these interventions have

potential to address health disparities. The current study tested an identity-specific intervention

($n = 30$) to a general positive psychology intervention ($n = 30$) and a control group ($n = 30$)

among sexual minorities. This built on a recent pilot study which tested the efficacy of an

identity-specific intervention designed for sexual minorities and showed significant

improvements in depressive and anxiety symptoms. Thus, I hypothesized that individuals in

intervention conditions would have better mental health, physical health, and substance use

outcomes than the control group. Additionally, outcomes of the identity-specific condition were

compared to those of the general positive psychology intervention. Participants included 91

sexual minority adults that completed three surveys (baseline, one week after the intervention,

one month follow-up) including outcomes measures (depressive symptoms, anxiety symptoms,

problematic drinking, problems associated with drug use, well-being, and self-rated health),

potential covariates (anticipated stigma, internalized stigma, concealment) and manipulation

checks (self-compassion, forgiveness, optimism, coping using humor, social support seeking).

Fifty-three participants completed interventions featuring five intervention tasks eliciting self-

compassion, optimism, forgiveness, humor, and social support seeking. Analyses included

descriptive statistics, bivariate correlations, and multilevel modeling. Compared to the control

condition, results showed significantly greater improvements in well-being ($b = .40$, $p = .013$),

self-rated health ($b = -.42$, $p = .006$), and problems associated with drug use ($b = -.97$, $p = .004$)

among participants in the intervention conditions. No significant differences emerged for

depressive symptoms, anxiety symptoms, or problematic drinking. Limitations include lack of

power for analyses examining extended follow-up and comparing intervention types, as well as a

number of history effects. Despite these limitations, the current study has potential to improve

health outcomes and aid clinical practices. More research on positive psychology interventions

with sexual minorities is needed.

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**Chapter 1. Introduction**

Sexual minorities experience worse health disparities in comparison to their heterosexual counterparts. These disparities consist of increased risk for worse mental health including depressive disorders, anxiety disorders, and substance use disorders (Kerridge et al., 2017), as well as worse physical health including worse pain and insomnia, and increased risk for diabetes, asthma, and high blood pressure (Branstrom et al., 2016). One explanation for these health disparities is minority stress, or the addition of unique stressors experienced by sexual minorities (e.g. discrimination, internalized homophobia; Meyer, 2003). Through the body of minority stress literature, we know what contributes to worse health among sexual minorities. More recent efforts have focused on building resilience (See Hill & Gunderson, 2015) in order to help ameliorate these health disparities. Positive psychology interventions, which often seek to build strengths, may aid in this effort. Thus, the purpose of the current study is to examine whether a positive psychology intervention improves health outcomes among sexual minorities.

On the contrary, positive psychology, as a field, has been criticized for a lack of diversity (see Rao & Donaldson, 2015; Vaughan et al., 2014). Consequently, it is possible that positive psychology interventions have been developed with the general, more privileged population in mind and that these interventions may not adequately address the unique stressors that sexual minorities face. Therefore, another purpose of the current study is to determine whether an identity-specific version of a positive psychology intervention is more effective in improving health outcomes in comparison to a general positive psychology intervention.

**Minority Stress and Health**

Minority stress is defined as the unique stressors that sexual minorities encounter, such as discrimination, prejudicial attitudes, and negative internalized attitudes about one's sexual

orientation (Meyer, 2003). Minority stressors include both distal, or external factors and proximal, or internal factors. Distal minority stressors include both interpersonal (such as discrimination, victimization, and prejudicial attitudes) and structural (such as discriminatory policies and laws, as well as unwelcoming social climates) factors. In contrast, proximal stressors occur within the individual, such as a sexual minority anticipating rejection or discrimination from others on the basis of sexual orientation, concealing their identity, or having negative attitudes towards one's sexual orientation. Minority stressors have been theorized to contribute to sexual minorities' disparities in mental health, physical health, and health-related behaviors.

*Mental Health Outcomes*

Minority stressors have consistently predicted worse mental health outcomes. Increased perceived discrimination was related to worse depressive symptoms in an online cross-sectional survey of 770 LGBT adults in Nebraska (McCarthy et al., 2014) and worse depressive symptoms, increased anxiety and perceived stress among 474 LGB adults in Florida who completed a survey at a public event (Walch et al., 2016). Similarly, stress associated with discrimination predicted worse depressive symptoms among 95 same-sex couples (Randall et al., 2017). Likewise, other distal minority stressors, like harassment have been related to worse mental distress among 685 LGB youth and emerging adults in Israel who participated in an online survey (Shilo & Mor, 2014). Additionally, some studies have examined the multiple types of distal minority stress simultaneously in relationship to mental health. For example, an online survey with a sample of 412 LGBTQ-identified young adults showed that distal minority stress (including discrimination and victimization) predicted worse anxiety and depression (Livingston et al., 2016). In a large sample of 4248 lesbian, gay, and bisexual adults, prejudice events (including harassment, discrimination, and microaggressions) related to distress (including well-

being, anxiety, and depression) both directly and indirectly through variables such internalized stigma, anticipated stigma, and rumination (Timmins et al., 2019).

This pattern of relationships also applies to proximal minority stressors. For example, internalized stigma was shown to predict worse depressive symptoms, anxiety, and less positive affect using baseline survey data of 2259 LGB adults (Herek et al., 2009), as well as relate to mental distress and worse wellbeing (Shilo & Mor, 2014). Further, concealment of sexual orientation has been longitudinally associated with worse wellbeing one year later among 396 LGB adults in New York City (Durso & Meyer, 2013), whereas a related construct, outness, was related to greater wellbeing in both cross-sectional research (Shilo & Mor, 2014) and a daily diary study among 84 lesbian and gay adults (Beals et al., 2009). In contrast, less research among sexual minorities has examined the direct relationship between anticipated stigma and mental health. However, anticipated stigma predicted psychological distress in two online surveys of college students with concealable stigmatized identities (including a small number of sexual minorities [$n = 14$ and $n = 18$]; Quinn & Chaudoir, 2009), and in an online survey of 218 sexual minorities, anticipated stigma has indirectly related to distress through constructs like self-compassion and self-esteem (Williams et al., 2017).

### *Physical Health Outcomes*

Likewise, minority stressors contribute to worse physical health outcomes, though less research has been conducted in this area. Notably, the relationship between distal minority stressors and physical health outcomes is well-established. Perceived discrimination has been linked to higher risks of obesity (Mereish, 2014) and health issues (Frost et al., 2015) and has also been related to sick days from work (Walch et al., 2016), number of health problems (Flenar et al., 2017), physical symptom severity (Denton et al., 2014) and self-rated physical health

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(Walch et al., 2016). Less research has established the relationship between proximal minority stress and physical health, though some research has supported the notion that they are related. In one such study, internalized stigma and anticipated rejection related to physical symptom severity (Denton et al., 2014) whereas other studies showed that anticipated stigma, internalized stigma, and concealment all related to a higher number of health problems (Flenar et al., 2017) and indirectly related to self-rated health through reduced social support (Williams et al., 2017).

*Health Behavior Outcomes*

In additional to mental and physical health outcomes, minority stress also contributes to behaviors that can have a negative impact on health, such as increased binge-eating (Mason & Lewis, 2015). More specifically, the current study will focus on substance use outcomes (i.e. alcohol and drug use), which consistently relate to various minority stressors. Regarding distal minority stressors, experiences of heterosexist discrimination have predicted increased hazardous drinking (Lewis et al., 2017), increased risk for a substance use disorder (McCabe et al., 2010), and illicit drug use (Drazdowski et al., 2016). Proximal minority stressors have been related to problematic substance use (Lehavot & Simoni, 2011) and hazardous drinking (Lewis et al., 2016). More specific proximal minority stressors, such as internalized stigma and concealment, are associated with increased alcohol use (Amadio, 2006; Baiocco et al., 2010). Further, internalized stigma has also related to more alcohol-related problems (Amadio, 2006; Feinstein & Newcomb, 2016), illicit drug use (Drazdowski et al., 2016) and drug-related problems (Feinstein & Newcomb, 2016).

*Mediators of Minority Stress and Health*

More recent research has examined the mechanisms through which minority stress contributes to worse health. Expanding upon the minority stress framework, Hatzenbuehler

(2009) proposed the psychological mediation framework, which established that minority stress affects health through diminished social resources, cognitive resources, and coping resources. Specifically in terms of mental health, Hatzenbuehler (2009) discussed that the experiences of discrimination and sexuality-based violence predict: emotional dysregulation that sexual minorities cope with in maladaptive ways (specifically mentioning rumination), social isolation from peers and family members, feelings of hopeless or pessimistic thinking about one's life circumstances related to sexual orientation, and negative self-schemas. Additional studies have provided empirical support of this framework. Specifically, social resources that have mediated minority stress and health include reduced social support (Beals et al., 2009; Kamen et al., 2017; Lehavot & Simoni, 2011; Schwartz et al., 2016; Williams et al., 2017) and social isolation (Hatzenbuehler et al., 2009; Lewis et al., 2016); this indicates that minority stress leads to sexual minorities either having less sources of social support or being less likely to utilize that social support, which can contribute to worse mental health and behaviors like substance use. Empirically supported cognitive mediators have included constructs such as self-esteem (Williams et al., 2017), self-compassion (Williams et al., 2017) and rumination (Hatzenbuehler et al., 2009; Schwartz et al., 2016), which suggests that minority stress affects health by leading sexual minorities to have more problematic cognitions about themselves and repeated thoughts about distressing situations. Finally, constructs such as avoidant coping (Schwartz et al., 2016), maladaptive coping (Kaysen et al., 2014), and resilience (Kamen et al., 2017), which suggests that minority stress can often lead sexual minorities to adopt more harmful coping strategies that contribute to worse health.

In sum, sexual minorities are at a greater risk for health disparities, in part due to minority stress through reduced social, cognitive, and coping resources. As researchers, it is not always

possible to reduce minority stress. Interventions cannot remove the experiences of discrimination, and some proximal minority stressors, like concealment, are used as defensive coping strategies to distal minorities stressors like victimization (Meyer, 2003). However, as research with the Psychological Mediation Framework has demonstrated mechanisms through which minority stress affects health, interventions can now bolster the resources that sexual minorities have in order to cope with minority stress (see Chaudoir et al., 2017 for a review of interventions with sexual minorities). Thus, the current study will focus on an intervention that can bolster strengths among sexual minorities.

**Positive Psychology Interventions**

Positive psychology interventions are programs that are based in the three pillars of positive psychology (a subfield of psychology that seeks to scientifically examine strengths and optimal functioning) that were proposed by Seligman and Csikszentmihalyi (2000). These pillars include 1) positive emotions and experiences, 2) virtues and character strengths, and 3) positive institutions. Many positive psychology interventions feature elements of positive emotions and experiences (e.g. Woodworth et al., 2017) or character strengths (e.g. Proyer et al., 2015). Because a review of online positive psychology interventions showed that majority of interventions featured strengths (Job & Williams, 2020), this paper focuses on the second pillar of positive psychology, its relationship to health, and interventions that elicit character strengths.

An inventory of character strengths was developed (Peterson & Seligman, 2004) and validated (Park et al., 2004) based on virtues and strengths endorsed across cultures and philosophies. These virtues and strengths include: wisdom (creativity, curiosity, judgement and open-mindedness, love of learning, perspective,), courage (bravery, integrity, persistence, zest or vitality), humanity (kindness, love, social intelligence), justice (citizenship, fairness, leadership),

temperance (forgiveness, humility, prudence, self-regulation,), and transcendence (appreciation of beauty and excellence, gratitude, hope and optimism, humor, spirituality). Elements from positive psychology, such as character strengths, are thought to affect health through health behaviors, physiological processes, and coping (See Park, 2015 for a review).

*Effects of PPIs on Mental Health*

Thus far, positive psychology interventions have been shown to affect mental health outcomes, such as symptoms of anxiety and depression. Among a sample of cardiac patients, both symptoms of depression and anxiety improved after participants completed an eight-week intervention featuring tasks such as recalling past positive experiences and successes, completing enjoyable activities alone and with others, using character strengths in a new way, writing a gratitude letter, and completing acts of kindness (Huffman et al., 2016). Likewise, depressive symptoms improved among a sample of primary care patients who completed a six-week intervention that included tasks related to gratitude, mindfulness, optimism, and savoring (Lambert D'raven et al., 2015).

Nonclinical samples have also demonstrated the mental health benefits of positive psychology interventions. For instance, a self-help positive psychology book, featuring tasks for optimism and gratitude, improved depressive symptoms among participants who were not in treatment for depression (Hanson, 2018). Similarly, a French sample showed immediate improvements in symptoms of anxiety and depression after completing a six-week intervention that included activities related to savoring, mindfulness, meaning and purpose, positive reappraisals of negative events, gratitude, discovering character strengths, and building positive relationships with others (Antoine et al., 2018). Additionally, depressive symptoms decreased among students who completed a semester-long course about positive psychology, in which they

completed activities such as kindness and gratitude journals, letters of forgiveness, using strengths in new ways, and mindfulness and savoring exercises (Goodmon et al., 2016). Thus, it is likely that completing positive psychology activities can improve mental health outcomes.

### *Effects of PPIs on Physical Health and Behaviors*

Fewer studies have examined the effects of positive psychology interventions on physical health outcomes or health behaviors, though preliminary findings from this literature suggest that positive psychology interventions may benefit these health domains. For example, an aforementioned intervention among primary care patients (Lambert D'raven et al., 2015) showed reduced perceived pain upon completion of the intervention. Similarly, another six-week intervention (including tasks related to using character strengths and gratitude) significantly decreased perceived bodily pain, even six months after the intervention (Hausmann et al., 2014). Researchers have also found similar findings among individuals with chronic pain and physical disabilities (Muller et al., 2016); in this study, participants completed a choice of four positive psychology activities (including tasks related to gratitude, kindness, optimism, and forgiveness). Results showed that the intervention improved pain intensity, pain interference, and pain control.

Though empirical research has not established the effects of positive psychology interventions on other aspects of health, it is reasonable to believe that such an intervention could have benefits. For instance, optimism interventions could improve physical health, as one meta-analytic study has shown that optimism is predictive of mortality, survival, cardiovascular health, immune function, cancer outcomes, pregnancy outcomes, physical symptoms (Rasmussen et al., 2009).

Additionally, there is some evidence to suggest that positive psychology interventions may have an impact on health behaviors, like physical activity and substance use. Among a

sample of physically inactive adults, an optimism intervention significantly increased physical activity eight weeks after the intervention (Strachan et al., 2017). Likewise, an intervention eliciting optimism and forgiveness increased the odds of a participant exercising two months after the intervention and decreased the odds of a participant binge drinking two years after the intervention (Torniainen-Holm et al., 2016). Thus, it could be possible that positive psychology interventions are beneficial to physical health behaviors.

*Online Positive Psychology Interventions*

Like in-person positive psychology interventions, those delivered online can elicit a variety of character strengths in order to improve health. However, online interventions can differ in terms of format. For instance, in-person interventions can more easily rely on mental health professionals, peer support groups, and professional life coaches. In contrast, online interventions typically require that participants work independently, such as through writing tasks that elicit character strengths (e.g. Gander et al. 2013; Harzer & Ruch, 2015) or through module-based interventions where participants are educated about a variety of character strengths and complete relevant activities (e.g. Addington et al., 2019; Drozd et al., 2014). This means that online positive psychology interventions are usually very cost-effective, as they do not require paid professionals. This also makes them more accessible to individuals who may have difficulties accessing mental healthcare, such as sexual minorities living in rural areas, who are more likely to experience both transportation issues (King & Dabelko-Schoeny, 2009) and are often more vulnerable to increased minority stress (Swank et al., 2012) and worse health disparities (Rosenkrantz et al., 2017).

Furthermore, online positive psychology interventions may be more acceptable in comparison to other interventions. Previous research has shown that while positive psychology

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interventions are just as effective as cognitive-behavioral therapy interventions, they are also more liked by participants (Lopez-Gomez et al., 2017). Additionally, the online format may be especially appealing to sexual minorities, as they allow for more privacy and anonymity than in-person interventions. In the context of more general resources, sexual minority youth and emerging adults have reported that they prefer health resources given in an online context (DeHaan et al., 2013). Thus, this could also extend to health interventions.

**Potential Points of Intervention**

In a systematic review of 130 articles featuring online positive psychology interventions, Job and Williams (2020) found that positive psychology interventions that were eliciting love, humor, optimism, spirituality, self-compassion, and gratitude had larger effect sizes than other strengths, such as self-regulation, appreciation of beauty, and kindness. Additionally, the authors provided a narrative review of the relations between some of these strengths' and minority stress, which determined that the following constructs should be translated for an intervention for sexual minorities: self-compassion, forgiveness, optimism, humor, and love.

*Self-Compassion*

Self-compassion has the potential to strengthen cognitive resources through which minority stress contributes to worse health (see Hatzenbuehler, 2009). Self-compassion is made up of three components: self-kindness during periods of suffering, a sense of common humanity that others also experience pain and sometimes fail in their goals, and mindfulness of one's feelings, in which one understands their negative feelings but does not overidentify with them (Neff, 2003). Neff (2003) suggested that higher self-compassion could promote better mental health, as more self-compassionate individuals would be kinder to themselves during negative or stressful events and would be more likely to use positive emotion-focused coping mechanisms.

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Among non-sexual minority samples, self-compassion has been related to increased happiness and positive affect, as well as decreased negative affect and neuroticism (Neff et al., 2007). Self-compassion has also predicted less severe depression and anxiety, though this was mediated by factors such as brooding and worrying (Raes, 2010).

In past research, self-compassion interventions have been beneficial to those with poor body image (Stern & Engeln, 2018) and those who are high in self-criticism (Krieger et al., 2019). Additionally, self-compassion interventions have been shown to improve mental health outcomes, such as depression and social anxiety (Shapira & Mongrain, 2010; Stevenson et al., 2019). Though no self-compassion interventions conducted with sexual minorities have been published, it is possible that self-compassion could specifically address minority stress by helping sexual minorities to be more accepting and compassionate of their identity, as well as not overidentifying with anxiety about prejudice from others. Conceptually, self-kindness may be beneficial to sexual minorities who are experiencing rejection from others or who may be overly critical of themselves because of their sexual identity, because individuals with higher self-kindness would cope with these negative experiences through positive means of self-care. A sense of common humanity may help sexual minorities to feel less isolated in their experiences of stigma, because there are other sexual minorities who may have similar experiences; thus, negative experiences are not a reflection of them as an individual, but rather, a reflection of stigma. Finally, mindfulness may address rumination due to various types of stigma, such as anxiety related to the anticipation of discrimination or rejection, as well as negative thoughts about oneself because of sexual orientation.

Among the established research with sexual minorities, reduced self-compassion has mediated the relationship between internalized stigma and quality of life among a sample of 213

sexual minorities (Fredrick et al., 2019). Furthermore, the relationship between anticipated

rejection and psychological distress was mediated by reduced self-compassion in a sample of

265 sexual minorities (Liao et al., 2015). Moreover, self-compassion mediated proximal minority

stress (including concealment, anticipated stigma, and internalized stigma) and physical health,

in which increased self-compassion was beneficial to health (Williams et al., 2017).

Additionally, self-compassion is predictive of happiness (Greene & Britton, 2015) and well-

being (Toplu-Demirtas et al., 2018) among sexual minorities.

### *Optimism*

Like self-compassion, optimism could address cognitive processes through which

minority stress contributes to worse health (see Hatzenbuehler, 2009). By bolstering optimism,

which is comprised of both positive thinking and mastery (i.e. the belief that one can have an

effect on their environment or current situations; Seligman, 2011), it could be possible to aid

sexual minorities in their belief that they can manage minority stressors, such as discrimination,

rejection or structural stigma, should they occur. In doing so, this could lessen the effects of

these minority stressors, and related stressors like the anticipated stigma, on health. Past

optimism interventions, such as the Best Possible Self task (off which the current study's

optimism task is based) have improved mental health outcomes like depression, happiness, and

positive affect (Auyeung & Mo, 2018; Layous et al., 2013; Shapira & Mongrain, 2010), as well

as physical activity (Strachan et al., 2017).

In contrast to self-compassion, literature focusing on optimism among sexual minorities

is scant. However, some literature suggests that optimism or hope (future-oriented optimism)

may benefit the mental health and wellbeing of sexual minorities. For instance, one study

suggests that hope predicts life satisfaction and buffers the relationship between hostile

workplace climate and life satisfaction among a small sample of LGB-identified individuals (Kwon & Hugelshofer, 2010). Additionally, optimism was related to fewer depressive symptoms, less psychological distress, better self-esteem, and less internalized homophobia among a sample of 348 gay men and lesbian women (Morrison, 2011). Thus, it could be possible that an optimism intervention task would benefit sexual minorities in terms of their mental health.

*Forgiveness*

Increasing forgiveness among sexual minorities could help bolster coping mechanisms when encountering distal minority stress; for example, in a sample of 276 sexual minority young adults, forgiveness after a victimization event significantly moderated the relationship between victimization stress and stress-related growth (contributing to more positive stress-related growth, and the relationship between minority stress and psychological distress (contributing to lower psychological distress; McCarthy, 2010). Additionally, forgiveness could address increased rumination, which has previously been shown to mediate minority stress and health (Hatzenbuehler et al., 2009). In fact, a forgiveness intervention has been shown to reduce rumination (Louden-Gerber, 2009), meaning that this could in turn, lead to more positive health outcomes. However, it should be noted that this relationship could be more complicated and bidirectional, as a longitudinal study suggests that increased rumination leads to reduced forgiveness (McCullough et al., 2007).

Furthermore, forgiveness has been shown to have mental and physical health benefits among sexual minorities. For instance, forgiveness of self, others, and situations is predictive of self-esteem among sexual minorities (Greene & Britton, 2012). Additionally, researchers conducted an expressive writing intervention among sexual minorities that was meant to elicit

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forgiveness after a hypothetical experience of hate speech (Crowley, 2014). The intervention

reduced cortisol levels among sexual minorities.

### *Humor*

Humor tasks could potentially help support individuals' coping resources, which mediate

the relationship between minority stress and health (Hatzenbuehler, 2009). Humor has been

theorized as a form of cognitive reappraisal that aids an individual in perceiving a situation as

less stressful, and thus, using humor can be beneficial for well-being (see Papousek, 2018 for a

review). Very little humor research exists among sexual minorities, despite that the majority of

sexual minorities in a survey reported that using humor to cope is helpful (Willard, 2011). That

said, there is research demonstrating the benefits of using humor as a coping mechanism among

other stigmatized groups. Additionally, there are no published humor interventions among sexual

minorities, but humor interventions have been shown to improve mental health (Gander et al.,

2013; Proyer et al., 2014; Tagalidou et al., 2019; Wellenzohn et al., 2016a; Wellenzohn et al.,

2016b). These interventions feature tasks involving recalling funny things (Gander et al., 2013;

Proyer et al., 2014; Wellenzohn et al., 2016b), applying humor (Wellenzohn et al., 2016b),

paying more attention to funny things (Wellenzohn et al., 2016a), and using humor to solve

stressful situations (Tagalidou et al., 2019; Wellenzohn et al., 2016b).

### *Love and Social Support*

Love interventions often ask participants to seek out connection with their loved ones

(e.g. Coulter & Malouff, 2013; Gander et al., 2013; Lucier-Greer et al., 2018). This would help

to address the social processes through which minority stress contribute to worse health

(Hatzenbuehler, 2009). As described previously, research has demonstrated that increased social

isolation and reduced social support mediate the relationship between minority stress (both distal

and proximal) and health (Hatzenbuehler et al., 2009; Williams et al., 2017). Thus, a task that encourages individuals to reflect on their loved ones and seek out connections with others could enhance their social resources to cope with minority stress.

Furthermore, a task eliciting love could specifically ask participants to reflect on their *chosen* family, a concept that is more common among sexual minorities, because their natal family may reject them. During such a task, participants would be asked to write about close loved ones that are accepting of their sexual orientation, and therefore, it could be possible that participants reflect on individuals who are either an ally or another member of the LGBTQ+ community. Thus, this kind of task could possibly enhance an individual's sense of community connectedness, or how close an individual feels to the LGBTQ+ community. In previous research, community connectedness has related to better well-being and higher self-esteem (Frost & Meyer, 2012).

**Results of Pilot Testing**

Prior to the proposed study, a pilot and feasibility trial of one of the current study's intervention conditions was conducted in the Spring of 2019. The purpose of this pilot trial was to test 1) whether the intervention protocol for an identity-specific positive psychology intervention was feasible and acceptable to participants and 2) preliminary efficacy of the identity-specific positive psychology intervention on mental health and substance use outcomes. This trial included 20 participants who all completed an identity-specific positive psychology intervention, in which tasks referenced their sexual orientation, stigma related to sexual orientation, or social connection with other members of the LGBTQ+ community or individuals affirming of their sexual orientation. The intervention included five tasks, each eliciting one of the following constructs (based upon the rationale presented in the previous sections): self-

compassion, optimism, forgiveness, humor, or social support seeking. Additionally, participants completed a baseline survey, a post-intervention survey one week after completing intervention tasks, and a follow-up survey four weeks after completing the post-intervention survey.

One week after the intervention, depressive symptoms significantly decreased from baseline measures of depressive symptoms ($t$ (19) = 2.37, $p$ = .03, Hedges g = .35). Additionally, anxiety symptoms had significantly decreased one month after the intervention ($t$ (19) = 2.72, $p$ = .01, Hedges g = .38). These results imply that mental health could also improve as a result of the current study's intervention, though it is currently unknown due to the pilot study's sample size. This trial included two other outcomes (problematic drinking, problems associated with drugs), which did not significantly change over the course of the study. This could be due to low reported substance use among the small sample of participants in the pilot trial, and thus, this should be tested again in a larger trial. Finally, results showed that anticipated discrimination significantly decreased one month after the intervention ($t$ (19) = 2.85, $p$ = .01, Hedges g = .31). This could imply that an identity-specific positive psychology intervention could reduce proximal minority stressors that contribute to worse mental health.

Additionally, this pilot trial demonstrated that the intervention was feasible to complete, as evidenced by retention rates and by open-ended feasibility surveys. All participants fully completed the study, with the exception of one participant who completed four out of the five intervention tasks. Qualitative results also showed that participants had few difficulties completing the intervention, and nineteen out of the twenty participants said they would recommend the intervention (one was unsure). Moreover, three participants said they already had recommended the intervention to someone they knew. Thus, it appears that participants accepted

the intervention. Participants provided minor feedback for changes in study procedures for the current study's intervention (See Table 1 for a summary).

**Table 1**

*Pilot Intervention Feedback from Participants (N=20) and Subsequent Changes to Intervention*

| Pilot Feedback | Subsequent Changes to Current Study |
|---|---|
| Revisit the forgiveness prompt to be more open-ended | Minor changes have been made to the prompt so that directions in the original prompt are now suggestions. Additionally, we added a reminder that there are no right/wrong answers. |
| Make reading the scales on the surveys easier | We will now split up longer scales into multiple matrices so that response options will be easier to see. |
| Space out the intervention tasks more; Sending links to all five tasks at once is overwhelming | We will now send one link to all study tasks that will save responses. Participants will be able to leave and return to the web page. |
| Provide more specific resources for handling negative feelings that come up from identity-specific intervention tasks (e.g. distress from recalling minority stress) | We will now provide additional resources (beyond our emergency resources that are provided after every study task) that may help participants find non-emergency services. We will not, however, provide any resources specific to study constructs, as to not influence study results. |

**Current Study**

In sum, sexual minorities are at greater risk for worse health outcomes (Branstrom et al., 2016; Kerridge et al., 2017), which may be due to minority stress (see Meyer, 2003). Positive psychology interventions may be able to help build resilience among sexual minorities, though

few positive psychology interventions including sexual minorities exist (see Job & Williams, 2020). Five positive psychology constructs in particular (self-compassion, optimism, social support, humor, and forgiveness) may be able to address the cognitive, social and coping processes through which minority stressors contribute to worse health (Job & Williams, 2020). In a previous pilot study, I developed an identity-specific positive psychology intervention eliciting these five constructs, which results showed improved depression and anxiety.

Thus, in the current study, I aimed to compare this piloted identity-specific PPI to a non-active control group and a general positive psychology intervention (eliciting the same five positive psychology constructs). Because of previous research highlighting the benefits of PPIs (e.g. Lambert D'raven et al., 2015) and because a pilot trial of the identity-specific positive psychology intervention had significant improvements on depression and anxiety, the following hypotheses were presented:

Hypothesis 1: Those in experimental conditions (both identity-specific and general PPIs) would report greater improvement in mental health (depressive symptoms, anxiety symptoms and well-being) compared to those in the control group.

Hypothesis 2: Those in experimental conditions (both identity-specific and general PPIs) would report greater improvement in self-rated physical health compared to those in the control group.

Hypothesis 3: Those in experimental conditions (both identity-specific and general PPIs) would report greater improvement in substance use outcomes (problematic drinking, problems associated drug use) compared to those in the control group.

Additionally, I examined whether tailoring a PPI to sexual minority experiences (e.g. minority stress, chosen family, connection with the LGBTQ+ community) made the intervention

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more effective than a PPI that simply elicits beneficial constructs. Thus, the following

exploratory aim was presented:

Exploratory Aim: Those in the identity-specific condition were compared to those in the

general positive psychology intervention in regards to improvement in mental health,

physical health and substance use outcomes.

**Chapter 2. Method**

**Participants**

The current study recruited 91 individuals, 83 of which completed at least two timepoints and were used for analyses. A power analysis was calculated via G*Power 3.1.9.2 power analysis to determine sample size, using a linear multiple regression statistical design (since power analyses cannot be calculated a priori for multilevel modeling), desired power of .80 and a medium effect size. This analysis determined that only 43 participants were needed. However, clustering of data from multilevel data collection diminishes power; thus, I recruited over twice as many participants that this analysis estimated was needed. Effective sample sizes for each analysis are reported in the Results section.

In order to be included in the study, participants had to identify as having a sexual orientation other than heterosexual (e.g. lesbian, gay, bisexual, pansexual, queer, etc.) and had to be at least 18 years old. Participants were recruited from targeted social media advertisements. Participants were entered into a lottery drawing to be randomly selected to win one of six $25 Amazon gift cards if they completed the baseline survey, one of seven $50 Amazon gift cards if they completed the post-intervention survey, and one of seven $75 Amazon gift cards if they completed the one-month follow-up survey. Table 2 presents all sample characteristics. There were no significant demographic differences based on condition. Participants were predominantly white (72.3%) and young (18 – 51 years, $M = 22.88$, $SD = 7.05$). Additionally, almost half (41%) identified as women, almost half (49.4%) identified as transgender or gender non-conforming, and over one-third (39.8%) identified with multiple sexual identities.

**Table 2**

*Sample Characteristics*

| | Total sample (N = 83) | Identity Specific (n = 26) | General (n = 27) | Control (n = 30) | p |
|---|---|---|---|---|---|
| Age | M = 22.88, SD = 7.05 | M = 22.27, SD = 5.72 | M = 22.04, SD = 6.08 | M = 24.13, SD = 8.73 | $F(2, 79) =$ .75, $p = .48$ |
| Gender Identity | | | | | $\chi^2 (10) = 8.28$, $p = .60$ |
| Woman | 41% (34) | 50% (13) | 37.0% (10) | 36.7% (11) | |
| Man | 20.5% (17) | 15.4% (4) | 22.2% (6) | 23.3% (7) | |
| Genderqueer | 8.4% (7) | 0% (0) | 14.8% (4) | 10.0% (3) | |
| Nonbinary | 21.7% (18) | 19.2% (5) | 22.2% (6) | 23.3% (7) | |
| Other | 7.2% (6) | 11.5% (3) | 3.7% (1) | 6.7% (2) | |
| Do not know | 1.2% (1) | 3.8% (1) | 0% (0) | 0% (0) | |
| Transgender or Gender Non-conforming | 49.4% (41) | 42.3% (11) | 51.9% (14) | 53.3% (16) | $\chi^2 (6) = 3.56$, $p = .74$ |
| Race | | | | | $\chi^2 (10) = 9.94$, $p = .45$ |
| White/Caucasian | 72.3% (60) | 73.1% (19) | 77.8% (21) | 66.7% (20) | |
| Black/African American | 9.6% (8) | 11.5% (3) | 3.7% (1) | 13.3% (4) | |
| Asian/Pacific Islander | 2.4% (2) | 7.7% (2) | 0% (0) | 0% (0) | |
| Hispanic/Latino/ Latina/Latinx | 4.8% (4) | 3.8% (1) | 3.7% (1) | 6.7% (2) | |
| Native American | 1.2 (1) | 0% (0) | 3.7% (1) | 0% (0) | |
| Multiracial/ethnic | 9.6% (8) | 3.8% (1) | 11.1% (3) | 13.3% (4) | |
| Sexual Orientation | | | | | $\chi^2 (14) = 9.56$, $p = .79$ |
| Lesbian | 9.6% (8) | 11.5% (3) | 11.1% (3) | 6.7% (2) | |
| Gay | 6% (5) | 7.7% (2) | 3.7% (1) | 6.7% (2) | |
| Bisexual | 24.1% (20) | 15.4% (4) | 29.6% (8) | 26.7% (8) | |
| Pansexual | 3.6% (3) | 3.8% (1) | 0% (0) | 6.7% (2) | |
| Asexual | 7.2% (6) | 7.7% (2) | 11.1% (3) | 3.3% (1) | |
| Queer | 8.4% (7) | 15.4% (4) | 3.7% (1) | 6.7% (2) | |
| Other (Demisexual) | 1.2% (1) | 0% (0) | 3.7% (1) | 0% (0) | |
| Multiple Identities | 39.8% (33) | 38.5% (10) | 37.0% (10) | 43.3% (13) | |
| *Lesbian* | 8.4% (7) | 11.5% (3) | 0% (0) | 13.3% (4) | |
| *Gay* | 6.0% (5) | 7.7% (2) | 3.7% (1) | 6.7% (2) | |
| *Bisexual* | 21.7% (18) | 15.4% (4) | 25.9% (7) | 23.3% (7) | |
| *Pansexual* | 10.8% (9) | 11.5% (3) | 14.8% (4) | 6.7% (2) | |
| *Asexual* | 9.6% (8) | 11.5% (3) | 11.1% (3) | 6.7% (2) | |
| *Queer* | 18.1% (15) | 11.5% (3) | 22.2% (6) | 20.0% (6) | |
| *Questioning* | 2.4% (2) | 3.8% (1) | 0% (0) | 3.3% (1) | |
| *Other* | 8.4% (7) | 11.5% (3) | 7.4% (2) | 6.7% (2) | |

**Procedure**

All procedures were approved by the East Tennessee State University Institutional Review Board prior to data collection. Social media advertisements and flyers included a link to a screening survey (Appendix B), in which prospective participants provided demographic and contact information. Eligible participants were contacted to schedule a phone call in which I obtained informed consent. After this occurred, participants were enrolled and randomized to one of three conditions: a general positive psychology intervention, an identity-specific positive psychology intervention, or a one-week waiting period. Then, participants were sent a link to the baseline survey. One week later, those in the intervention conditions were sent five intervention tasks to complete over the course of one-week, whereas those in the control condition were not sent any tasks. One week after the intervention period was over, all participants were sent a post-intervention survey. Additionally, all participants were sent another follow-up survey one month after the intervention period. A study flow diagram is provided in Figure 1. All surveys and intervention tasks took place via REDCap (Research Electronic Data Capture), a secure web-based application designed to support data collection (Harris et al., 2009).

**Figure 1**

*Study Flow Diagram*
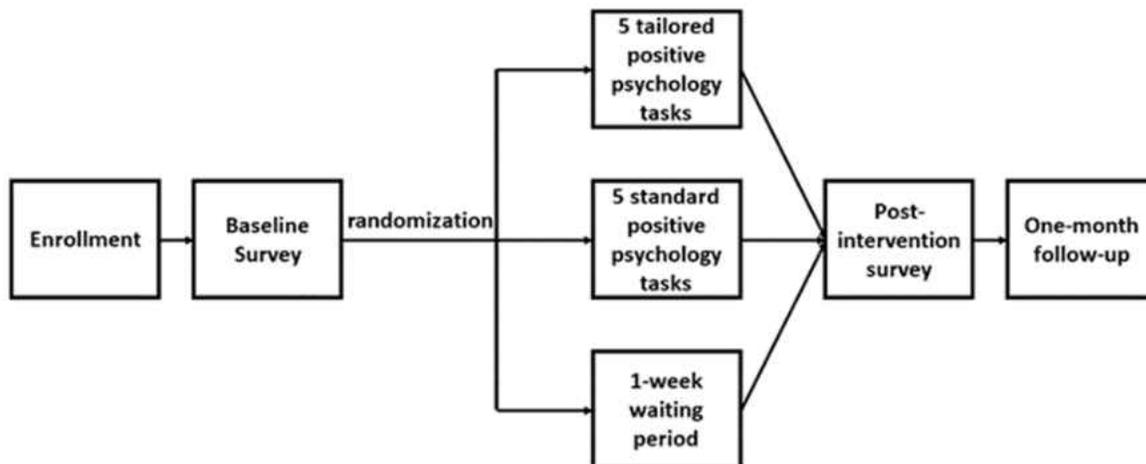
**Measures**

*Intervention*

Both the general positive psychology intervention and the identity-specific positive psychology intervention featured five 15-minute writing tasks designed to elicit the following constructs: self-compassion, forgiveness, optimism, coping with humor, and seeking out social support from others. Identity-specific tasks were tailored to reference the unique experiences of sexual minorities (e.g. minority stressors, chosen family, etc.).

For the self-compassion task, those in the general positive psychology condition were asked to write a compassionate letter to themselves about a past difficult or stressful experience as if they were writing to a friend (Appendix Q; Shapira & Mongrain, 2010). This task included elements of self-kindness, sense of common humanity, and mindfulness. Those in the identity-specific condition responded to the same prompt, though they were asked to specifically write about a stressful experience related to their sexual orientation.

For the forgiveness task, participants responded to a prompt that first asked them to recall a time that someone shared a derogatory viewpoint about them (Appendix R; Crowley, 2014); for those in the identity-specific condition, this derogatory viewpoint was about the participant's sexual orientation. After recalling this experience, participants were asked to consider the positive aspects of forgiving their transgressor. The prompt presented participants with a variety of ways that they may want to approach the task, such as choosing to empathize with their transgressor or instead focusing on how it may benefit themselves to let go of negative feelings about the experience.

For the optimism task, participants completed the Best Possible Self task (Appendix S; Shapira & Mongrain, 2010). In this task, participants wrote in response to a prompt asking them

to imagine themselves in the future when problems that currently concern them have been resolved. Participants were asked to first write about what this future is like and what they are doing in the future. Then participants were asked to reflect on what steps they will need to take in order to achieve this future, as if their future self is giving advice to their current self. For those in the identity-specific condition, participants were asked to respond to the prompt with concerns related to their sexual orientation in mind.

For the humor task, participants completed the Solving Stressful Situations with Humor task (Appendix T; Wellenzohn, Proyer, & Ruch, 2016b). In this task, participants responded to a prompt that asks them to either imagine or recall a scenario in which someone shares a derogatory viewpoint about either their personality (general condition) or their sexual orientation (identity-specific condition). Participants were asked to write about the ways they could solve this situation in humorous ways.

For the social support task (derived from Riggle & Rostosky, 2012), participants were first asked to create a list of those in their chosen family who are supportive of their sexual orientation (identity-specific condition; Appendix U) or those who are in their general social circle (general condition; Appendix V). After creating this list, participants were asked to write about supportive statements they would like to hear from their list of individuals, as well as activities they would like to do with these individuals. Participants were also asked to reflect on what social support from their list of individuals means to them and how these individuals have positively impacted the participant's life.

### Demographics

Participants were asked to provide their age, gender identity, sexual orientation, and race and ethnicity. They were also asked if they considered themselves transgender, and if they

consider themselves gender nonconforming. Demographic questions can be found in Appendix C.

*Internalized Stigma*

Participants were asked to complete the Internalized Homonegativity subscale of the LGB Identity Scale (Mohr & Kendra, 2012). This subscale includes three items assessing negative attitudes towards the participants' sexual orientation. An example item is "if it were possible, I would choose to be straight". Potential responses range from 1 (disagree strongly) to 6 (agree strongly). Previous research has shown that the scale is reliable (Mohr & Kendra, 2011), and in the current study, reliability was good (alpha = .878). Scores for this measure were averaged. This scale can be found in Appendix D.

*Concealment*

Concealment was measured by the Concealment Motivation subscale of the LGB Identity Scale (Mohr & Kendra, 2012), which features three items assessing how motivated participants are to conceal their sexual orientation. Response range from 1 (disagree strongly) to 6 (agree strongly). An example item of this scale is "I prefer to keep my same-sex romantic relationships rather private". This scale was shown to be reliable in previous research (Mohr & Kendra, 2012; alpha = .79), and it also had good reliability in the current study (alpha = .813). Mean scores were calculated. This scale can be found in Appendix D.

*Anticipated Stigma*

The Everyday Discrimination Scale (Williams et al., 1997) was adapted to measure anticipation of everyday discrimination events. This scale includes nine items asking participants how much they expect others to treat them poorly or unfairly on the basis of their sexual orientation. An example of this is "you would be treated with less respect than others".

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Responses range from 1 (not at all likely) to 7 (very likely). Previous research with sexual minorities has shown that the scale is reliable (Williams et al., 2017), and reliability was excellent in the current study (alpha = .901). Scores for this measure were averaged. This scale can be found in Appendix E.

*Depressive Symptoms*

Frequency of depressive symptoms was measured by the Center for Epidemiological Studies Depression scale (CESD; Radloff, 1977). Participants were asked to assess how often they have experienced 20 depressive symptoms in the past week, on a scale of 0 (rarely or none of the time/less than one day) to 3 (most or all of the time/5-7 days). An example item is "I did not feel like eating; my appetite was poor". Previous studies with sexual minority samples have found that this scale is reliable (Lehavot & Simoni, 2011; Schwartz et al., 2016), and the scale demonstrated excellent reliability in the current study (alpha = .920). Scores for this measure were summed. This scale can be found in Appendix F.

*Anxiety Symptoms*

Symptoms of anxiety were measured by the Beck Anxiety Inventory (BAI; Beck et al., 1988). Participants were asked to evaluate how much 21 symptoms of anxiety had bothered them in the last month. Example items include "dizzy or lightheaded", "hot/cold sweats", and "terrified or afraid". Responses range from 0 (not at all) to 3 (severely – it bothered me a lot). Previous research with sexual minorities have shown that the scale is reliable (Silva et al., 2015). In the current study, reliability was excellent (alpha = .931). Scores for this measure were summed. This scale can be found in Appendix G.

### Problematic Drinking

The AUDIT (Saunders et al., 1993) includes 10 items that were used to measure problematic drinking behaviors. Participants were asked to evaluate the frequency of their drinking (as well as binge drinking) and frequency of symptoms of alcohol dependence. They were also asked about problems associated with drinking, such as whether someone has expressed concern about their drinking or if they have experienced difficulties with completing daily tasks due to their drinking. Each question is scored on a scale of 0 to 4, and total summed scores ranged from 0 to 40. In the current study, reliability was acceptable (alpha = .757). Additionally, other studies have found that the scale was reliable (Lewis et al., 2016). This scale can be found in Appendix H.

### Problems Associated with Drug Use

The Short Inventory of Problems-Modified for Drug Use (SIP-DU; Allensworth-Davies et al., 2012) was used to measure how frequently participants experience 15 problems due to their drug use. An example of this is "when using drugs, I have done impulsive things that I regretted later". Responses range from 0 (never) to 3 (daily or almost daily). Previous research has shown that the scale is reliable (Allensworth-Davies et al., 2012), and the current study found that the scale had good reliability (alpha = .877). Scores for this measure were summed. This scale can be found in Appendix I.

### Well-Being

The Flourishing Scale (Diener et al., 2010) includes 8 items that were used to measure well-being. Participants responded to items evaluating their satisfaction with life, relationships, and their sense of purpose in life, which collectively provide a measurement of general psychological well-being. An example is "I am a good person and live a good life". Responses

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range from 1 (strongly disagree) to 7 (strongly agree). This scale has been shown to have acceptable reliability in previous research with sexual minorities (alpha = .90; Lefevor et al., 2019), and the scale had excellent reliability in the current study (alpha = .926). Scores for this measure were averaged. This scale can be found in Appendix J.

### Self-Rated Health

One item from the Health-related Quality of Life (SF-12) scale (Ware et al., 1996) was used to assess self-rated health. Participants were asked to rate their general health. Responses range from 1 to 5 and include: excellent, very good, good, fair, and poor. Higher scores indicate worse health. This item has been used previously with sexual minorities (Williams et al., 2017) and can be found in Appendix K.

### Self-Compassion

The Self-compassion Scale – Short form (Raes et al., 2011) includes 12 items that were used to measure self-compassion as a manipulation check for the self-compassion task. An example item is "I try to see my failings as part of the human condition". Responses range from 1 (almost never) to 5 (almost always). This scale has demonstrated acceptable reliability in previous research with sexual minorities (Williams et al., 2017), and in the current study, reliability was good (alpha = .836). Scores for this measure were averaged. This scale can be found in Appendix L.

### Optimism

The 9-item Version of the Personal Optimism and Self-Efficacy Optimism (Gavrilov-Jerkovic et al., 2014) was used to measure optimism as a manipulation check for the Best Possible Self task. Participants were asked to respond to items regarding how optimistically they think about their future and solving their problems. An example item is "I can master

difficulties". Potential responses range from 0 (completely incorrect) to 3 (completely correct). Previous research has shown that the scale is reliable (Gavrilov-Jerkovic et al., 2014), and reliability was good (alpha = .845) in the current study. Scores for this measure were averaged. This scale can be found in Appendix M.

*Forgiveness*

The Heartland Forgiveness Scale (Yamhure Thompson et al., 2005) was used to measure forgiveness as a manipulation check for the forgiveness task. This scale has 18 items, which include six items about forgiveness of self, six items about forgiveness of others, and six items about forgiveness of situations. An example item is "I eventually make peace with bad situations in my life". Responses range from 1 (almost always false of me) to 7 (almost always true of me). The scale has been shown to be reliable in previous research (Yamhure Thompson et al., 2005) and had good reliability in the current study (alpha = .886). Scores for this measure were averaged. This scale can be found in Appendix N.

*Coping with Humor*

The Coping Humor Scale (Martin & Lefcourt, 1983) was used to measure the participants' inclination of using humor as a coping mechanism. These six items were used as a manipulation check for the Solving Stressful Situations with Humor intervention task. An example item for this scale is "I have often found that my problems have been greatly reduced when I try to find something funny in them". Responses range from 1 (strongly disagree) to 4 (strongly agree). This scale has been reliable in previous research (Martin & Lefcourt, 1983) and was good in the current study (alpha = .826). Scores for this measure were averaged. This scale can be found in Appendix O.

### Social Support Seeking

The Social Activation Scale (Williams & Mickelson, 2008) was used to assess how frequently a participant directly or indirectly seeks out social support from their loved ones. This scale includes five items for direct social support seeking behaviors and seven items for indirect social support seeking behaviors. An example of a direct social support seeking item is "asked them for help or advice about what to do about the problems", and an example of an indirect social support seeking item is "complained about your problems in a general way, without telling details or asking for any help". Responses range from 0 (never) to 3 (often). In the current study, reliability of the direct social support seeking subscale was good (alpha = .816), and reliability of the indirect social support seeking subscale was acceptable (alpha = .717). Previous research has found that both subscales were reliable (Williams et al., 2016; Williams & Mickelson, 2008). Scores for this measure were averaged. This scale can be found in Appendix P.

## Proposed Data Analyses and Expected Results

### Preliminary Analysis

Data cleaning and total and mean scores for variables were calculated via SPSS. Additionally, descriptive statistics for all timepoints and correlations for baseline measures were conducted in SPSS. Data analyses also included preliminary paired t-tests comparing the baseline and post-intervention survey for manipulation check variables (self-compassion, forgiveness, optimism, coping using humor, and social support seeking) to see if the intervention elicited these constructs as intended. Additionally, I conducted between-subjects ANOVAs for each of the minority stress variables (anticipated stigma, internalized stigma, and concealment) measured at baseline to determine if these variables need to be controlled for in further analyses.

*Hypothesis Testing*

Intervention effects were analyzed using multilevel modeling (via RStudio; RStudio Team, 2015), using the following R packages: *haven* (Wickham et al., 2019), *lme4* (Bates et al., 2015), and *sjPlot* (Lüdecke, 2019). These analyses examined whether there were differences in outcomes (depression, anxiety, well-being, self-rated health, alcohol use, problems associated with drug use) among the three conditions (identity-specific positive psychology intervention, general positive psychology intervention, waitlist control) over the course of three timepoints (baseline, one-week post-intervention, one-month post-intervention).

For all analyses, timepoint was analyzed as a Level-1 predictor; its main effect demonstrated whether outcomes significantly vary over time in the control group. Condition was analyzed as a time-invariant Level- 2 predictor; its main effect demonstrated whether there are significant differences between groups at baseline. I also tested a Timepoint by Condition interaction, which showed whether there are differences in intervention effects over time. To test Hypotheses 1, 2, and 3 (that there will be more improvement of outcomes among intervention groups in comparison to the control group), groups were dummycoded as 0 for the nonactive control group or 1 for either of the intervention groups. To test my exploratory aim (that that there will be more improvement of outcomes among the identity-specific intervention in comparison to the general intervention), additional analyses were conducted with only the two intervention groups to directly examine the difference between the two interventions. Each analysis was conducted in a two-step process, in which the post-intervention measurement first was compared to only the baseline measurement in order to assess the effect of the intervention; then the post-intervention measurement was compared to the one-month follow-up to see if any effects of the intervention were maintained.

I expected to find a significant condition by time interaction in which 1) those in the intervention conditions would have greater improvements in outcomes over time in comparison to a waitlist control group at the post-intervention measurement, and 2) those in the identity-specific positive psychology intervention would have greater improvements in outcomes over times in comparison to both a waitlist control group and a general positive psychology intervention group at the post-intervention measurement. These results were expected to be maintained through the one-month follow-up.

*Sensitivity Analyses*

To conduct sensitivity analyses, a trained undergraduate research assistant and I coded each intervention task for the construct it was intended to elicit (e.g. self-compassion), during which our codes were in agreeance 92.77%. Thus, Condition was coded in four ways: what condition was assigned, what condition was participated in (i.e. participants who completed no tasks were recoded as the control group), whether participants at least were conceptually engaged with most tasks (i.e. intervention tasks successfully elicited the targeted construct in at least four tasks), and whether participants completed the intervention as intended (i.e. intervention tasks successfully elicited the targeted construct in all five tasks). When testing hypotheses comparing collapsed intervention groups to the control, new codes for sensitivity analyses replaced the Condition variable in regression analyses. For example, instead of testing for an interaction between timepoint and randomly assigned condition, sensitivity analyses would test for interaction between timepoint and whether a participant complete five writing tasks as intended. This helps prevent significant intervention effects from being obscured by the inclusion of participants who were assigned to complete intervention tasks but did not.

When conducting analyses for the exploratory aim comparing intervention groups, new codes for sensitivity analyses were added as covariates. This was done in order to include all intervention participants, while still controlling for participants who did not complete intervention tasks as intended.

**Chapter 3. Results**

**Preliminary Analyses**

Prior to hypothesis testing, I calculated means and standard deviations for all timepoints, conducted correlational analyses for all variables at baseline, and ran paired t-tests for all manipulation check variables. Total means and standard deviations for each timepoint are reported in Table 3. For mean and standard deviation comparisons for hypothesis testing, a breakdown of means and standard deviations of the control group compared to collapsed intervention conditions is reported in Table 4, and a similar breakdown comparing each intervention is reported in Table 5. Baseline correlations are reported in Table 6. Notably, self-compassion significantly related to decreased depressive symptoms ($r = -.522$, $p < .001$), decreased anxiety symptoms ($r = -.361$, $p = .001$), and higher well-being ($r = .491$, $p < .001$). Likewise, forgiveness also significantly related to decreased depressive symptoms ($r = -.444$, $p < .001$), decreased anxiety symptoms ($r = -.314$, $p = .004$), higher well-being ($r = .448$, $p < .001$), and more problems associated with drug use ($r = .351$, $p = .001$). Additionally, optimism significantly related to decreased depressive symptoms ($r = -.624$, $p < .001$), decreased anxiety symptoms ($r = -.291$, $p = .008$), and higher well-being ($r = .740$, $p < .001$). Similarly, indirect social support seeking was significantly related to increased depressive symptoms ($r = .403$, $p < .001$), increased anxiety symptoms ($r = .279$, $p = .012$) and lower well-being ($r = -.403$, $p < .001$)

**Table 3**

*Means and Standard Deviations for Each Timepoint*

|  | Baseline | Post-intervention | One-month follow-up |
|---|---|---|---|
| CESD | (*M* = 25.01, *SD* = 12.43, *n* = 83) | (*M* = 23.77, *SD* = 12.23, *n* = 83) | (*M* = 24.08, *SD* = 14.15, *n* = 72) |
| BAI | (*M* = 19.11, *SD* = 12.45, *n* = 83) | (*M* = 16.23, *SD* = 10.70, *n* = 83) | (*M* = 15.92, *SD* = 12.72, *n* = 72) |
| WB | (*M* = 4.96, *SD* = 1.28, *n* = 83) | (*M* = 5.10, *SD* = 1.18, *n* = 83) | (*M* = 5.03, *SD* = 1.26, *n* = 72) |
| SRH | (*M* = 2.78, *SD* = .83, *n* = 83) | (*M* = 2.69, *SD* = .85, *n* = 83) | (*M* = 2.76, *SD* = .95, *n* = 71) |
| AUDIT | (*M* = 2.90, *SD* = 3.74, *n* = 82) | (*M* = 2.60, *SD* = 3.13, *n* = 83) | (*M* = 2.41, *SD* = 2.88, *n* = 72) |
| SIPDU | (*M* = .80, *SD* = 2.33, *n* = 83) | (*M* = .71, *SD* = 2.22, *n* = 83) | (*M* = .83, *SD* = 2.65, *n* = 72) |
| IS | (*M* = 1.58, *SD* = .94, *n* = 83) | (*M* = 1.49, *SD* = .80, *n* = 83) | (*M* = 1.56, *SD* = .94, *n* = 72) |
| CON | (*M* = 3.46, *SD* = 1.25, *n* = 82) | (*M* = 3.59, *SD* = 1.23, *n* = 82) | (*M* = 3.59, *SD* = 1.30, *n* = 71) |
| AS | (*M* = 4.37, *SD* = 1.31, *n* = 83) | (*M* = 4.08, *SD* = 1.49, *n* = 83) | (*M* = 4.26, *SD* = 1.44, *n* = 72) |
| SC | (*M* = 2.57, *SD* = .65, *n* = 83) | (*M* = 2.75, *SD* = .72, *n* = 83) | (*M* = 2.73, *SD* = .81, *n* = 72) |
| OPT | (*M* = 1.71, *SD* = .56, *n* = 83) | (*M* = 1.75, *SD* = .61, *n* = 83) | (*M* = 1.77, *SD* = .65, *n* = 71) |
| FORG | (*M* = 4.38, *SD* = .92, *n* = 83) | (*M* = 4.44, *SD* = .97, *n* = 83) | (*M* = 4.35, *SD* = 1.07, *n* = 71) |
| HUM | (*M* = 2.79, *SD* = .72, *n* = 83) | (*M* = 2.87, *SD* = .71, *n* = 83) | (*M* = 2.81, *SD* = .69, *n* = 71) |
| DSS | (*M* = 1.70, *SD* = .78, *n* = 81) | (*M* = 1.77, *SD* = .75, *n* = 82) | (*M* = 1.69, *SD* = .72, *n* = 69) |
| ISS | (*M* = 2.04, *SD* = .52, *n* = 81) | (*M* = 1.92, *SD* = .58, *n* = 82) | (*M* = 1.96, *SD* = .53, *n* = 69) |

Note. CESD = depressive symptoms, BAI = anxiety symptoms, WB = well-being, SRH = self-rated health, AUDIT = problematic drinking, SIPDU = problems associated with drug use, IS = internalized stigma, CON = concealment, AS = anticipated stigma, SC = self-compassion, OPT = optimism, FORG = forgiveness, HUM = coping with humor, DSS = direct support seeking, ISS = indirect support seeking

**Table 4**

*Means and Standard Deviations for Control and Intervention Groups*

| | Interventions (N = 53) | | | Control (N = 30) | | |
|---|---|---|---|---|---|---|
| | Baseline | Post-intervention | One-month follow-up | Baseline | Post-intervention | One-month follow-up |
| CESD | (*M* = 23.51, *SD* = 13.58, *n* = 53) | (*M* = 21.32, *SD* = 11.89, *n* = 53) | (*M* = 22.98, *SD* = 15.06, *n* = 45) | (*M* = 27.67, *SD* = 9.74, *n* = 30) | (*M* = 28.10, *SD* = 11.80, *n* = 30) | (*M* = 25.93, *SD* = 12.54, *n* = 27) |
| BAI | (*M* = 17.09, *SD* = 11.41, *n* = 53) | (*M* = 15.15, *SD* = 10.69, *n* = 53) | (*M* = 14.96, *SD* = 13.10, *n* = 45) | (*M* = 22.67, *SD* = 13.56, *n* = 30) | (*M* = 18.13, *SD* = 10.63, *n* = 30) | (*M* = 17.52, *SD* = 12.13, *n* = 27) |
| WB | (*M* = 5.05, *SD* = 1.30, *n* = 53) | (*M* = 5.34, *SD* = 1.07, *n* = 53) | (*M* = 5.10, *SD* = 1.30, *n* = 45) | (*M* = 4.78, *SD* = 1.25, *n* = 30) | (*M* = 4.67, *SD* = 1.25, *n* = 30) | (*M* = 4.91, *SD* = 1.22, *n* = 27) |
| SRH | (*M* = 2.74, *SD* = .81, *n* = 53) | (*M* = 2.53, *SD* = .87, *n* = 53) | (*M* = 2.69, *SD* = 1.00, *n* = 45) | (*M* = 2.87, *SD* = .86, *n* = 30) | (*M* = 2.97, *SD* = .77, *n* = 30) | (*M* = 2.88, *SD* = .86, *n* = 26) |
| AUDIT | (*M* = 2.91, *SD* = 4.08, *n* = 53) | (*M* = 2.47, *SD* = 3.30, *n* = 53) | (*M* = 2.13, *SD* = 2.90, *n* = 45) | (*M* = 2.90, *SD* = 3.09, *n* = 29) | (*M* = 2.83, *SD* = 2.84, *n* = 30) | (*M* = 2.89, *SD* = 2.82, *n* = 27) |
| SIPDU | (*M* = 1.06, *SD* = 2.76, *n* = 53) | (*M* = .62, *SD* = 1.96, *n* = 53) | (*M* = 1.00, *SD* = 2.98, *n* = 45) | (*M* = .33, *SD* = 1.15, *n* = 30) | (*M* = .87, *SD* = 2.65, *n* = 30) | (*M* = .56, *SD* = 2.01, *n* = 27) |

Note. CESD = depressive symptoms, BAI = anxiety symptoms, WB = well-being, SRH = self-rated health, AUDIT = problematic drinking, SIPDU = problems associated with drug use. One person failed to sufficiently provide enough information for an AUDIT score at baseline but were kept in analyses, as multilevel analyses can handle some missing data.

**Table 5**

*Means and Standard Deviations for Identity-Specific and General Interventions*

| | Identity-Specific Intervention (N = 26) | | | General Intervention (N = 27) | | |
|---|---|---|---|---|---|---|
| | Baseline | Post-intervention | One-month follow-up | Baseline | Post-intervention | One-month follow-up |
| CESD | (*M* = 22.46, *SD* = 13.57, *n* = 26) | (*M* = 21.69, *SD* = 12.06, *n* = 26) | (*M* = 24.57, *SD* = 16.20, *n* = 21) | (*M* = 24.52, *SD* = 13.77, *n* = 27) | (*M* = 20.96, *SD* = 11.93, *n* = 27) | (*M* = 21.58, *SD* = 14.20, *n* = 24) |
| BAI | (*M* = 16.08, *SD* = 12.55, *n* = 26) | (*M* = 13.81, *SD* = 11.09, *n* = 26) | (*M* = 14.05, *SD* = 14.17, *n* = 21) | (*M* = 18.07, *SD* = 10.34, *n* = 27) | (*M* =16.44, *SD* = 10.34, *n* = 27) | (*M* = 15.75, *SD* = 12.34, *n* = 24) |
| WB | (*M* = 4.99, *SD* = 1.47, *n* = 26) | (*M* = 5.23, *SD* = 1.24, *n* = 26) | (*M* = 5.15, *SD* = 1.35, *n* = 21) | (*M* = 5.12, *SD* = 1.13, *n* = 27) | (*M* = 5.45, *SD* = .88, *n* = 27) | (*M* = 5.05, *SD* = 1.28, *n* = 24) |
| SRH | (*M* = 2.73, *SD* = .67, *n* = 26) | (*M* = 2.46, *SD* = .76, *n* = 26) | (*M* = 2.67, *SD* = .97, *n* = 21) | (*M* = 2.74, *SD* = .94, *n* = 27) | (*M* = 2.59, *SD* = .97, *n* = 27) | (*M* = 2.71, *SD* = 1.04, *n* = 24) |
| AUDIT | (*M* = 3.38, *SD* = 5.19, *n* = 26) | (*M* = 2.96, *SD* = 4.11, *n* = 26) | (*M* = 2.29, *SD* = 3.45, *n* = 21) | (*M* = 2.44, *SD* = 2.64, *n* = 27) | (*M* = 2.00, *SD* = 2.25, *n* = 27) | (*M* = 2.00, *SD* = 2.40, *n* = 24) |
| SIPDU | (*M* = 1.35, *SD* = 2.99, *n* = 26) | (*M* = .62, *SD* = 2.33, *n* = 26) | (*M* = 1.48, *SD* = 3.94, *n* = 21) | (*M* = .78, *SD* = 2.55, *n* = 27) | (*M* = .63, *SD* = 1.57, *n* = 27) | (*M* = .58, *SD* = 1.74, *n* = 24) |

Note. CESD = depressive symptoms, BAI = anxiety symptoms, WB = well-being, SRH = self-rated health, AUDIT = problematic drinking, SIPDU = problems associated with drug use

**Table 6**

*Baseline Correlations*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. CESD | - | | | | | | | | | | | | | | |
| 2. BAI | *.672* | - | | | | | | | | | | | | | |
| 3. WB | **-.565** | -.264 | - | | | | | | | | | | | | |
| 4. SRH | **.343** | **.319** | **-.336** | - | | | | | | | | | | | |
| 5. AUDIT | .077 | .038 | -.090 | .165 | - | | | | | | | | | | |
| 6. SIPDU | -.147 | -.179 | .023 | -.023 | *.509* | - | | | | | | | | | |
| 7. IS | .206 | .032 | **-.331** | **.318** | .143 | .072 | - | | | | | | | | |
| 8. CON | .165 | .115 | *.228* | .129 | -.126 | -.014 | **.363** | - | | | | | | | |
| 9. AS | *.430* | **.386** | **-.287** | .128 | -.167 | -.136 | .159 | *.448* | - | | | | | | |
| 10. SC | **-.522** | **-.361** | *.491* | -.182 | .052 | *.219* | -.068 | -.159 | **-.295** | - | | | | | |
| 11. OPT | **-.624** | **-.291** | *.740* | -.269 | .026 | .157 | -.173 | -.151 | *.258* | *.569* | - | | | | |
| 12. FORG. | **-.444** | **-.314** | *.448* | -.108 | .127 | **.351** | -.094 | -.138 | **-.298** | *.766* | *.565* | - | | | |
| 13. HUM | -.077 | .016 | .067 | -.025 | .148 | .059 | -.013 | .136 | .084 | .165 | .156 | .111 | - | | |
| 14. DSS | .036 | .231 | .101 | .130 | .033 | .006 | -.116 | **-.371** | -.183 | .062 | .085 | .169 | .043 | - | |
| 15. ISS | *.403* | *.279* | **-.403** | .099 | .104 | -.005 | .037 | .058 | *.262* | **-.370** | **-.402** | **-.373** | -.023 | .121 | - |

Note. Significant correlations are flagged as such: *p* < .05 is *italicized*, *p* <. 01 is **bolded**, *p* < .001 is ***bolded and italicized***. CESD = depressive symptoms, BAI = anxiety symptoms, WB = well-being, SRH = self-rated health, AUDIT = problematic drinking, SIPDU = problems associated with drug use, IS = internalized stigma, CON = concealment, AS = anticipated stigma, SC = self-compassion, OPT = optimism, FORG = forgiveness, HUM = coping with humor, DSS = direct support seeking, ISS = indirect support seeking

Additionally, pre/post paired t-tests for manipulation check variables are reported in Table 7. Results showed a pattern of significant increases in self-compassion across both intervention conditions, and significant increases in coping with humor and direct support seeking when interventions were collapsed.

**Table 7**

*Pre/Post Comparisons for Manipulation Check Variables*

|  | Baseline | Post-intervention | T-test | *p* | *d* |
|---|---|---|---|---|---|
| *Both Interventions* |  |  |  |  |  |
| SC | *M* = 2.65, *SD* = .69 | *M* = 2.92, *SD* = .75 | *t* (52) = 4.52 | **< .001** | .43 |
| OPT | *M* = 1.75, *SD* = .61 | *M* = 1.83, *SD* = .63 | *t* (52) = 1.48 | .144 | .37 |
| FORG | *M* = 4.54, *SD* = .97 | *M* = 4.65, *SD* = .91 | *t* (52) = 1.48 | .145 | .55 |
| HUM | *M* = 2.75, *SD* = .69 | *M* = 2.85, *SD* = .67 | *t* (52) = 2.17 | **.035** | .34 |
| DSS | *M* = 1.65, *SD* = .76 | *M* = 1.83, *SD* = .66 | *t* (50) = 2.26 | **.028** | .56 |
| ISS | *M* = 2.00, *SD* = .54 | *M* = 1.94, *SD* = .53 | *t* (50) = -1.01 | .320 | .46 |
| *Identity-specific* |  |  |  |  |  |
| SC | *M* = 2.85, *SD* = .76 | *M* = 3.07, *SD* = .86 | *t* (25) = 2.90 | **.008** | .38 |
| OPT | *M* = 1.72, *SD* = .69 | *M* = 1.73, *SD* = .70 | *t* (25) = .175 | .863 | .30 |
| FORG | *M* = 4.71, *SD* = 1.01 | *M* = 4.72, *SD* = .90 | *t* (25) = .183 | .856 | .42 |
| HUM | *M* = 2.78, *SD* = .63 | *M* = 2.90, *SD* = .65 | *t* (25) = 1.95 | .062 | .32 |
| DSS | *M* = 1.62, *SD* = .80 | *M* = 1.83, *SD* = .80 | *t* (24) = 1.77 | .090 | .61 |
| ISS | *M* = 2.01, *SD* = .52 | *M* = 1.96, *SD* = .57 | *t* (24) = -.47 | .643 | .45 |
| *General Intervention* |  |  |  |  |  |
| SC | *M* = 2.46, *SD* =.57 | *M* = 2.77, *SD* = .60 | *t* (26) = 3.44 | **.002** | .47 |
| OPT | *M* = 1.79, *SD* = .53 | *M* = 1.93, *SD* = .55 | *t* (26) = 1.68 | .105 | .43 |
| FORG | *M* = 4.37, *SD* = .92 | *M* = 4.58, *SD* = .93 | *t* (26) = 1.65 | .112 | .64 |
| HUM | *M* = 2.72, *SD* = .76 | *M* = 2.80, *SD* = .70 | *t* (26) = 1.15 | .261 | .36 |
| DSS | *M* = 1.68, *SD* = .73 | *M* = 1.83, *SD* = .52 | *t* (25) = 1.39 | .178 | .52 |
| ISS | *M* = 2.00, *SD* = .57 | *M* = 1.92, *SD* = .51 | *t* (25) = -.92 | .367 | .48 |

*Note.* Significant p-values are bolded. SC = self-compassion, OPT = optimism, FORG = forgiveness, HUM = coping with humor, DSS = direct support seeking, ISS = indirect support seeking

**Hypothesis Testing**

*Hypothesis 1*

Multilevel modeling was conducted to test Hypothesis 1, which was that those in experimental conditions (both identity-specific and general PPIs) would report greater improvement in mental health (depressive symptoms, anxiety symptoms and well-being) compared to those in the control group.

**Depressive Symptoms (CESD).** For analyses comparing baseline to post-intervention CESD scores ($N = 83$), multilevel modeling results showed no significant main effect of time (meaning that there was no significant change in the control group), condition (meaning there was significant difference between conditions at the baseline assessment), or interaction (meaning there was no significant effect of intervention on depressive symptoms at the post-intervention assessment). This was consistent across sensitivity analyses. For analyses comparing post-intervention to one-month follow CESD scores ($N = 72$), multilevel modeling results show that there was no significant main effect of time, meaning there was no significant change in the control group). However, there was a significant main effect of condition ($p = .024$), with participants in the intervention conditions having significantly lower CESD scores at post-intervention assessments). Additionally, sensitivity analyses showed that when adjusting for engaging with the targeted constructs in the intervention tasks, there was a significant interaction effect ($p = .025$), in which participants in the control group had a significant decrease in CESD scores in comparison to participants in the intervention conditions.

Effective sample size calculations showed that analyses comparing baseline and post-intervention CESD scores were sufficiently powered ($N = 46.89$, Power $= .848$), but that analyses comparing post-intervention and one-month follow-up CESD scores were slightly

underpowered ($N = 42.35$, Power = .795). Table 8 shows regression results for comparisons between baseline and post-intervention, and Table 9 shows regression results for comparisons between post-intervention and one-month follow-up.

**Table 8**

*Multilevel Models for Baseline and Post CESD Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est.* | *CI* | *p* | *Est.* | *CI* | *p* | *Est.* | *CI* | *p* | *Est.* | *CI* | *p* |
| (Intercept) | 27.67 | 23.34 – 32.00 | **<0.001** | 25.67 | 21.64 – 29.70 | **<0.001** | 25.91 | 22.33 – 29.50 | **<0.001** | 24.78 | 21.62 – 27.94 | **<0.001** |
| timepoint | 0.43 | -2.55 – 3.42 | 0.776 | 0.11 | -2.62 – 2.84 | 0.936 | 0.04 | -2.39 – 2.47 | 0.971 | -0.64 | -2.78 – 1.49 | 0.555 |
| G1: Assigned condition | -4.16 | -9.58 – 1.26 | 0.133 | | | | | | | | | |
| timepoint:G1 | -2.62 | -6.36 – 1.11 | 0.169 | | | | | | | | | |
| G2: Any tasks | | | | -1.16 | -6.51 – 4.20 | 0.672 | | | | | | |
| timepoint:G2 | | | | -2.39 | -6.01 – 1.24 | 0.197 | | | | | | |
| G3: 4 tasks | | | | | | | -1.96 | -7.26 – 3.33 | 0.468 | | | |
| timepoint:G3 | | | | | | | -2.81 | -6.40 – 0.78 | 0.125 | | | |
| G4: 5 tasks | | | | | | | | | | 0.80 | -5.08 – 6.69 | 0.789 |
| timepoint:G4 | | | | | | | | | | -2.06 | -6.04 – 1.91 | 0.309 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 34.76 | | | 34.86 | | | 34.57 | | | 35.13 | | |
| $\tau_{00}$ | 111.68 record_id | | | 117.32 record_id | | | 115.97 record_id | | | 118.56 record_id | | |
| ICC | 0.76 | | | 0.77 | | | 0.77 | | | 0.77 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.050 / 0.775 | | | 0.014 / 0.774 | | | 0.024 / 0.776 | | | 0.004 / 0.772 | | |

**Table 9**

*Multilevel Models for Post and Follow-Up CESD Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 29.30 | 24.41 – 34.19 | **<0.001** | 28.75 | 23.92 – 33.58 | **<0.001** | 29.00 | 24.73 – 33.27 | **<0.001** | 25.94 | 22.18 – 29.70 | **<0.001** |
| timepoint | -3.37 | -7.18 – 0.44 | 0.083 | -3.39 | -7.13 – 0.34 | 0.075 | -3.46 | -6.76 – -0.16 | **0.040** | -2.94 | -5.75 – -0.12 | **0.041** |
| G1: Assigned condition | -7.14 | -13.33 – -0.95 | **0.024** | | | | | | | | | |
| timepoint:G1 | 4.19 | -0.63 – 9.01 | 0.088 | | | | | | | | | |
| G2: Any tasks | | | | -6.41 | -12.58 – -0.24 | **0.042** | | | | | | |
| timepoint:G2 | | | | 4.32 | -0.46 – 9.10 | 0.076 | | | | | | |
| G3: 4 tasks | | | | | | | -8.11 | -14.06 – -2.16 | **0.008** | | | |
| timepoint:G3 | | | | | | | 5.27 | 0.66 – 9.87 | **0.025** | | | |
| G4: 5 tasks | | | | | | | | | | -3.18 | -9.56 – 3.21 | 0.329 |
| timepoint:G4 | | | | | | | | | | 6.30 | 1.52 – 11.08 | **0.010** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 51.05 | | | 50.88 | | | 49.60 | | | 48.55 | | |
| $\tau_{00}$ | 117.08 record_id | | | 118.89 record_id | | | 116.24 record_id | | | 124.47 record_id | | |
| ICC | 0.70 | | | 0.70 | | | 0.70 | | | 0.72 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.041 / 0.709 | | | 0.032 / 0.710 | | | 0.054 / 0.717 | | | 0.014 / 0.723 | | |

**Anxiety Symptoms (BAI).** For analyses comparing baseline and post-intervention BAI

scores ($N = 83$), multilevel modeling results showed that there was a significant main effect of

time ($p = .002$), demonstrating that BAI scores significantly decreased among participants in the

control group. Additionally, there was a significant main effect of condition ($p = .034$), in which

intervention participants had significantly lower BAI scores at baseline, though this difference

was nonsignificant in subsequent sensitivity analyses. In sensitivity analyses adjusting for

completion of any intervention tasks, there was a significant interaction ($p = .038$) in which there

were larger decreases in BAI scores among participants in the control group, though this was

nonsignificant in other analyses. For analyses comparing post-intervention and follow-up BAI

scores ($N = 72$), multilevel modeling results showed no significant effect of time, condition, or

interaction.

For analyses comparing baseline and post-intervention BAI scores, effective sample size

calculations showed that analyses were sufficiently powered ($N = 47.98$, Power $= .857$).

However, for analyses comparing BAI scores at post-intervention and one-month follow-up,

analyses were underpowered ($N = 39.78$, Power $= .771$). Table 10 shows regression results for

comparisons between baseline and post-intervention, and Table 11 shows regression results for

comparisons between post-intervention and one-month follow-up.

**Table 10**

*Multilevel Models for Baseline and Post BAI Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 22.67 | 18.56 – 26.77 | **<0.001** | 21.53 | 17.75 – 25.31 | **<0.001** | 20.71 | 17.32 – 24.10 | **<0.001** | 19.07 | 16.10 – 22.04 | **<0.001** |
| timepoint | -4.53 | -7.41 – -1.66 | **0.002** | -4.94 | -7.53 – -2.36 | **<0.001** | -3.73 | -6.09 – -1.38 | **0.002** | -3.64 | -5.69 – -1.59 | **<0.001** |
| G1: Assigned condition | -5.57 | -10.71 – -0.43 | **0.034** | | | | | | | | | |
| timepoint:G1 | 2.59 | -1.00 – 6.18 | 0.158 | | | | | | | | | |
| G2: Any tasks | | | | -4.27 | -9.30 – 0.75 | 0.096 | | | | | | |
| timepoint:G2 | | | | 3.65 | 0.21 – 7.08 | **0.038** | | | | | | |
| G3: 4 tasks | | | | | | | -3.50 | -8.51 – 1.51 | 0.171 | | | |
| timepoint:G3 | | | | | | | 1.86 | -1.62 – 5.35 | 0.294 | | | |
| G4: 5 tasks | | | | | | | | | | 0.14 | -5.38 – 5.67 | 0.960 |
| timepoint:G4 | | | | | | | | | | 2.64 | -1.17 – 6.46 | 0.174 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 32.21 | | | 31.33 | | | 32.56 | | | 32.27 | | |
| $\tau_{00}$ | 99.45 record_id | | | 102.71 record_id | | | 101.93 record_id | | | 103.30 record_id | | |
| ICC | 0.76 | | | 0.77 | | | 0.76 | | | 0.76 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.049 / 0.767 | | | 0.032 / 0.774 | | | 0.029 / 0.765 | | | 0.021 / 0.767 | | |

**Table 11**

*Multilevel Models for Post and Follow-Up BAI Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 19.04 | 14.58 – 23.50 | **<0.001** | 18.75 | 14.36 – 23.14 | **<0.001** | 19.14 | 15.24 – 23.05 | **<0.001** | 16.51 | 13.12 – 19.90 | **<0.001** |
| timepoint | -1.52 | -4.29 – 1.25 | 0.283 | -1.64 | -4.36 – 1.07 | 0.236 | -2.00 | -4.42 – 0.42 | 0.105 | -1.66 | -3.75 – 0.43 | 0.120 |
| G1: Assigned condition | -3.15 | -8.79 – 2.49 | 0.274 | | | | | | | | | |
| timepoint:G1 | 0.59 | -2.92 – 4.09 | 0.743 | | | | | | | | | |
| G2: Any tasks | | | | -2.75 | -8.36 – 2.86 | 0.337 | | | | | | |
| timepoint:G2 | | | | 0.80 | -2.67 – 4.28 | 0.651 | | | | | | |
| G3: 4 tasks | | | | | | | -4.03 | -9.48 – 1.41 | 0.147 | | | |
| timepoint:G3 | | | | | | | 1.65 | -1.73 – 5.02 | 0.338 | | | |
| G4: 5 tasks | | | | | | | | | | 1.61 | -4.14 – 7.36 | 0.583 |
| timepoint:G4 | | | | | | | | | | 1.46 | -2.09 – 5.01 | 0.420 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 26.95 | | | 26.92 | | | 26.65 | | | 26.75 | | |
| $\tau_{00}$ | 112.85 record_id | | | 113.48 record_id | | | 112.32 record_id | | | 113.64 record_id | | |
| ICC | 0.81 | | | 0.81 | | | 0.81 | | | 0.81 | | |
| Marginal R$^2$ / Conditional R$^2$ | 0.016 / 0.810 | | | 0.012 / 0.811 | | | 0.022 / 0.812 | | | 0.012 / 0.812 | | |

**Well-Being.** For analyses comparing well-being at baseline and post-intervention measurements ($N = 83$), multilevel modeling results no significant main effect of time, meaning well-being did not significantly change in the control group. There was also no significant main effect of condition, meaning that there were no significant differences at baseline measurements. However, there was a significant interaction effect ($p = .013$), in which participants in the intervention conditions had a greater increase in well-being. This was consistent across most sensitivity analyses, with the exception of a nonsignificant finding when adjusting for engaging with targeted constructs in at least four intervention tasks ($p = .061$).

In analyses comparing well-being at post-intervention and one-month follow-up measurements ($N = 72$), results showed a significant main effect of time ($p = .045$), in which participants in the control group had a significant increase in well-being. However, this was nonsignificant in sensitivity analyses. Additionally, there was a significant main effect of condition ($p = .009$), in which participants in intervention conditions had significantly higher well-being at post-intervention measurements, which was consistent across sensitivity analyses. Lastly, there was a significant interaction effect ($p = .004$), in which well-being decreased for participants in the intervention conditions and increased for participants in the control group, which was consistent across sensitivity analyses.

Calculations for effective sample size determined that analyses were sufficiently powered when comparing baseline and post-intervention well-being ($N = 47.98$, Power $= .838$), but slightly underpowered when comparing post-intervention and one-month follow-up well-being ($N = 41.14$, Power $= .784$). Table 12 shows regression results for comparisons between baseline and post-intervention, and Table 13 shows regression results for comparisons between post-intervention and one-month follow-up.

**Table 12**

*Multilevel Models for Baseline and Post Well-Being Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 4.78 | 4.35 – 5.22 | **<0.001** | 4.90 | 4.50 – 5.30 | **<0.001** | 4.74 | 4.39 – 5.09 | **<0.001** | 4.85 | 4.54 – 5.16 | **<0.001** |
| timepoint | -0.11 | -0.37 – 0.14 | 0.386 | -0.09 | -0.32 – 0.14 | 0.462 | 0.01 | -0.20 – 0.22 | 0.938 | 0.03 | -0.15 – 0.21 | 0.733 |
| G1: Assigned condition | 0.27 | -0.27 – 0.81 | 0.328 | | | | | | | | | |
| timepoint:G1 | 0.40 | 0.08 – 0.72 | **0.013** | | | | | | | | | |
| G2: Any tasks | | | | 0.11 | -0.42 – 0.64 | 0.693 | | | | | | |
| timepoint:G2 | | | | 0.41 | 0.10 – 0.72 | **0.009** | | | | | | |
| G3: 4 tasks | | | | | | | 0.47 | -0.05 – 0.99 | 0.075 | | | |
| timepoint:G3 | | | | | | | 0.30 | -0.01 – 0.61 | 0.061 | | | |
| G4: 5 tasks | | | | | | | | | | 0.37 | -0.20 – 0.94 | 0.206 |
| timepoint:G4 | | | | | | | | | | 0.39 | 0.05 – 0.73 | **0.024** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.25 | | | 0.25 | | | 0.26 | | | 0.26 | | |
| $\tau_{00}$ | 1.22 record_id | | | 1.25 record_id | | | 1.17 record_id | | | 1.20 record_id | | |
| ICC | 0.83 | | | 0.83 | | | 0.82 | | | 0.82 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.043 / 0.836 | | | 0.026 / 0.837 | | | 0.069 / 0.830 | | | 0.051 / 0.834 | | |

**Table 13**

*Multilevel Models for Post and Follow-Up Well-Being Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 4.59 | 4.13 – 5.04 | **<0.001** | 4.63 | 4.18 – 5.08 | **<0.001** | 4.59 | 4.19 – 4.98 | **<0.001** | 4.81 | 4.46 – 5.15 | **<0.001** |
| timepoint | 0.32 | 0.01 – 0.64 | **0.045** | 0.29 | -0.02 – 0.61 | 0.065 | 0.24 | -0.04 – 0.52 | 0.087 | 0.18 | -0.05 – 0.42 | 0.129 |
| G1: Assigned condition | 0.77 | 0.19 – 1.35 | **0.009** | | | | | | | | | |
| timepoint:G1 | -0.58 | -0.98 – -0.18 | **0.004** | | | | | | | | | |
| G2: Any tasks | | | | 0.71 | 0.14 – 1.29 | **0.015** | | | | | | |
| timepoint:G2 | | | | -0.55 | -0.95 – -0.15 | **0.007** | | | | | | |
| G3: 4 tasks | | | | | | | 0.94 | 0.39 – 1.49 | **0.001** | | | |
| timepoint:G3 | | | | | | | -0.55 | -0.94 – -0.16 | **0.005** | | | |
| G4: 5 tasks | | | | | | | | | | 0.76 | 0.17 – 1.35 | **0.012** |
| timepoint:G4 | | | | | | | | | | -0.65 | -1.05 – -0.25 | **0.002** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.35 | | | 0.36 | | | 0.35 | | | 0.34 | | |
| $\tau_{00}$ | 1.12 record_id | | | 1.12 record_id | | | 1.06 record_id | | | 1.13 record_id | | |
| ICC | 0.76 | | | 0.76 | | | 0.75 | | | 0.77 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.048 / 0.772 | | | 0.042 / 0.769 | | | 0.085 / 0.771 | | | 0.044 / 0.777 | | |

*Hypothesis 2*

Multilevel Modeling was used to test Hypothesis 2, which was that those in experimental conditions (both identity-specific and general PPIs) would report greater improvement in self-rated physical health compared to those in the control group. For analyses comparing self-rated health at baseline and post-intervention measurements ($N = 83$), results showed no significant main effects of time (meaning that there were no significant changes in the control group) or condition (meaning that there were no significant differences at baseline). Additionally, there was no significant interaction effect in the original analysis. However, all subsequent sensitivity analyses supported a significant interaction effect ($p = .006$, $p = .001$, $p = .002$), in which participants in intervention conditions reported a decrease in worse self-rated health and participants in the control group reported an increase in worse self-rated health.

For analyses comparing self-rated health at post-intervention and one-month follow-up ($N = 72$), results showed that there was no significant main effect of time, suggesting that self-rated health did not significantly change among participants in the control group. Across all sensitivity analyses, there was a significant effect of condition ($p = .01$), in which participants in the intervention conditions had significantly better self-rated health at post-intervention measurements. Additionally, there was a significant interaction ($p = .025$) across all sensitivity analyses, in which worse self-rated health increased among participants in intervention conditions and decreased among participants in the control condition.

Effective sample size calculations showed that analyses were sufficiently powered when comparing baseline and post-intervention self-rated health ($N = 50.61$, Power $= .881$) but were slightly underpowered when comparing post-intervention and one-month follow-up self-rated health ($N = 41.62$, Power $= .795$). Table 14 shows regression results for comparisons between

baseline and post-intervention, and Table 15 shows regression results for comparisons between

post-intervention and one-month follow-up.

**Table 14**

*Multilevel Models for Baseline and Post Self-Rated Health Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.87 | 2.57 – 3.16 | **<0.001** | 2.78 | 2.51 – 3.05 | **<0.001** | 2.82 | 2.58 – 3.06 | **<0.001** | 2.81 | 2.60 – 3.02 | **<0.001** |
| timepoint | 0.10 | -0.15 – 0.35 | 0.432 | 0.14 | -0.08 – 0.36 | 0.222 | 0.13 | -0.06 – 0.33 | 0.180 | 0.05 | -0.12 – 0.22 | 0.562 |
| G1: Assigned condition | -0.13 | -0.50 – 0.24 | 0.491 | | | | | | | | | |
| timepoint:G1 | -0.31 | -0.62 – 0.00 | 0.054 | | | | | | | | | |
| G2: Any tasks | | | | 0.01 | -0.35 – 0.37 | 0.959 | | | | | | |
| timepoint:G2 | | | | -0.42 | -0.71 – -0.12 | **0.006** | | | | | | |
| G3: 4 tasks | | | | | | | -0.09 | -0.44 – 0.27 | 0.636 | | | |
| timepoint:G3 | | | | | | | -0.50 | -0.79 – -0.21 | **0.001** | | | |
| G4: 5 tasks | | | | | | | | | | -0.11 | -0.50 – 0.28 | 0.597 |
| timepoint:G4 | | | | | | | | | | -0.51 | -0.83 – -0.19 | **0.002** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.24 | | | 0.23 | | | 0.22 | | | 0.23 | | |
| $\tau_{00}$ | 0.45 record_id | | | 0.46 record_id | | | 0.45 record_id | | | 0.45 record_id | | |
| ICC | 0.65 | | | 0.67 | | | 0.67 | | | 0.66 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.037 / 0.661 | | | 0.032 / 0.676 | | | 0.065 / 0.690 | | | 0.059 / 0.683 | | |

**Table 15**

*Multilevel Models for Post and Follow-Up Self-Rated Health Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 3.04 | 2.71 – 3.37 | **<0.001** | 3.04 | 2.71 – 3.36 | **<0.001** | 3.09 | 2.81 – 3.37 | **<0.001** | 2.91 | 2.67 – 3.16 | **<0.001** |
| timepoint | -0.15 | -0.40 – 0.09 | 0.222 | -0.15 | -0.39 – 0.09 | 0.231 | -0.15 | -0.36 – 0.07 | 0.176 | -0.07 | -0.25 – 0.12 | 0.485 |
| G1: Assigned condition | -0.55 | -0.96 – -0.13 | **0.010** | | | | | | | | | |
| timepoint:G1 | 0.35 | 0.04 – 0.66 | **0.025** | | | | | | | | | |
| G2: Any tasks | | | | -0.56 | -0.97 – -0.15 | **0.008** | | | | | | |
| timepoint:G2 | | | | 0.35 | 0.04 – 0.66 | **0.025** | | | | | | |
| G3: 4 tasks | | | | | | | -0.76 | -1.15 – -0.37 | **<0.001** | | | |
| timepoint:G3 | | | | | | | 0.42 | 0.12 – 0.71 | **0.005** | | | |
| G4: 5 tasks | | | | | | | | | | -0.63 | -1.06 – -0.21 | **0.003** |
| timepoint:G4 | | | | | | | | | | 0.39 | 0.07 – 0.70 | **0.015** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.21 | | | 0.21 | | | 0.20 | | | 0.20 | | |
| $\tau_{00}$ | 0.56 record_id | | | 0.55 record_id | | | 0.51 record_id | | | 0.55 record_id | | |
| ICC | 0.73 | | | 0.73 | | | 0.72 | | | 0.73 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.051 / 0.743 | | | 0.054 / 0.743 | | | 0.111 / 0.752 | | | 0.068 / 0.746 | | |

*Hypothesis 3*

Multilevel modeling was used to test Hypothesis 3, which was that those in experimental conditions (both identity-specific and general PPIs) will report greater improvement in substance use outcomes (problematic drinking, problems associated drug use) compared to those in the control group.

**Problematic Drinking (AUDIT).** For analyses comparing AUDIT scores at baseline and post-intervention ($N = 83$), results showed no significant main effect of time, meaning that there was no significant change in AUDIT scores for participants in the control group. Additionally, there was no significant main effect of condition, meaning that there were no significant differences at baseline measurements. When adjusting for engaging with the targeted constructs in all five intervention tasks, there was a significant interaction ($p = .049$) in which participants in the intervention conditions reported greater reductions in AUDIT scores, though this was not significant in any other analyses.

For analyses comparing AUDIT scores at post-intervention and one-month follow-up ($N = 72$), there were no significant main effects for time or condition, and there was no significant interaction effect.

Effective sample size calculations demonstrated that analyses comparing baseline and post-intervention AUDIT scores were sufficiently powered ($N = 44.15$, Power $= .828$), but analyses comparing post-intervention and one-month follow-up AUDIT scores were not ($N = 38.50$, Power $= .758$). Table 16 shows regression results for comparisons between baseline and post-intervention, and Table 17 shows regression results for comparisons between post-intervention and one-month follow-up.

**Table 16**

*Multilevel Models for Baseline and Post AUDIT Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.81 | 1.57 – 4.05 | **<0.001** | 2.51 | 1.38 – 3.64 | **<0.001** | 2.61 | 1.60 – 3.62 | **<0.001** | 2.79 | 1.90 – 3.67 | **<0.001** |
| timepoint | 0.02 | -0.59 – 0.64 | 0.942 | -0.01 | -0.57 – 0.55 | 0.976 | -0.17 | -0.67 – 0.34 | 0.517 | -0.04 | -0.47 – 0.39 | 0.855 |
| G1: Assigned condition | 0.10 | -1.46 – 1.65 | 0.904 | | | | | | | | | |
| timepoint:G1 | -0.46 | -1.22 – 0.31 | 0.241 | | | | | | | | | |
| G2: Any tasks | | | | 0.64 | -0.86 – 2.14 | 0.404 | | | | | | |
| timepoint:G2 | | | | -0.46 | -1.20 – 0.28 | 0.222 | | | | | | |
| G3: 4 tasks | | | | | | | 0.57 | -0.92 – 2.07 | 0.451 | | | |
| timepoint:G3 | | | | | | | -0.23 | -0.97 – 0.51 | 0.543 | | | |
| G4: 5 tasks | | | | | | | | | | 0.30 | -1.34 – 1.94 | 0.722 |
| timepoint:G4 | | | | | | | | | | -0.79 | -1.58 – -0.00 | **0.049** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 1.42 | | | 1.42 | | | 1.44 | | | 1.38 | | |
| $\tau_{00}$ | 10.56 record_id | | | 10.52 record_id | | | 10.50 record_id | | | 10.58 record_id | | |
| ICC | 0.88 | | | 0.88 | | | 0.88 | | | 0.88 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.003 / 0.881 | | | 0.006 / 0.882 | | | 0.006 / 0.880 | | | 0.004 / 0.885 | | |

**Table 17**

*Multilevel Models for Post and Follow-Up AUDIT Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 3.00 | 1.85 – 4.15 | **<0.001** | 2.89 | 1.76 – 4.03 | **<0.001** | 2.83 | 1.81 – 3.85 | **<0.001** | 3.06 | 2.19 – 3.93 | **<0.001** |
| timepoint | -0.11 | -0.68 – 0.46 | 0.702 | -0.11 | -0.67 – 0.45 | 0.707 | -0.11 | -0.61 – 0.38 | 0.653 | -0.32 | -0.75 – 0.12 | 0.151 |
| G1: Assigned condition | -0.38 | -1.84 – 1.08 | 0.612 | | | | | | | | | |
| timepoint:G1 | -0.38 | -1.10 – 0.34 | 0.305 | | | | | | | | | |
| G2: Any tasks | | | | -0.21 | -1.66 – 1.24 | 0.776 | | | | | | |
| timepoint:G2 | | | | -0.39 | -1.11 – 0.32 | 0.282 | | | | | | |
| G3: 4 tasks | | | | | | | -0.13 | -1.54 – 1.29 | 0.862 | | | |
| timepoint:G3 | | | | | | | -0.45 | -1.15 – 0.24 | 0.202 | | | |
| G4: 5 tasks | | | | | | | | | | -0.86 | -2.34 – 0.61 | 0.252 |
| timepoint:G4 | | | | | | | | | | -0.08 | -0.82 – 0.66 | 0.830 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 1.14 | | | 1.14 | | | 1.13 | | | 1.16 | | |
| $\tau_{00}$ | 8.23 record_id | | | 8.27 record_id | | | 8.28 record_id | | | 8.11 record_id | | |
| ICC | 0.88 | | | 0.88 | | | 0.88 | | | 0.88 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.012 / 0.880 | | | 0.008 / 0.880 | | | 0.008 / 0.881 | | | 0.023 / 0.878 | | |

**Problems Associated with Drug Use (SIPDU).** For analyses comparing SIPDU scores at baseline and post-intervention assessments ($N = 83$), there was a significant main effect of time, meaning that there was a significant increase in SIPDU scores among participants in the control group ($p = .049$), though this was nonsignificant in all subsequent sensitivity analyses. Additionally, there was no significant main effect of condition, meaning that there were no significant differences at baseline measurements. Moreover, there was a significant interaction ($p = .004$), in which SIPDU scores decreased among participants in intervention conditions and increased among participants in the control condition. Almost all subsequent sensitivity analyses supported this significant interaction, with the exception of a nonsignificant interaction ($p = .058$) when adjusting for completion of any intervention task.

For analyses comparing SIPDU scores at post-intervention and one-month follow-up assessments ($N = 72$), there were no significant main effects of time or condition. There was a significant interaction ($p = .037$), in which SIPDU scores increased for participants in the intervention conditions and decreased for participants in the control condition. However, this finding was nonsignificant in sensitivity analyses adjusting for engaging with the targeted constructs in the intervention tasks.

Effective sample size calculations showed that analyses examining SIPDU scores were sufficiently powered when comparing baseline and post-intervention scores ($N = 46.89$, Power = .848), but not when comparing post-intervention and one-month follow-up scores ($N = 38.50$, Power = .758). Table 18 shows regression results for comparisons between baseline and post-intervention, and Table 19 shows regression results for comparisons between post-intervention and one-month follow-up.

**Table 18**

*Multilevel Models for Baseline and Post SIPDU Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 0.33 | -0.48 – 1.15 | 0.423 | 0.58 | -0.16 – 1.33 | 0.126 | 0.51 | -0.15 – 1.18 | 0.132 | 0.76 | 0.18 – 1.34 | **0.010** |
| timepoint | 0.53 | 0.00 – 1.06 | **0.049** | 0.28 | -0.22 – 0.78 | 0.274 | 0.31 | -0.13 – 0.75 | 0.163 | 0.15 | -0.23 – 0.54 | 0.438 |
| G1: Assigned condition | 0.72 | -0.30 – 1.74 | 0.164 | | | | | | | | | |
| timepoint:G1 | -0.97 | -1.63 – -0.30 | **0.004** | | | | | | | | | |
| G2: Any tasks | | | | 0.37 | -0.62 – 1.37 | 0.460 | | | | | | |
| timepoint:G2 | | | | -0.64 | -1.30 – 0.02 | 0.058 | | | | | | |
| G3: 4 tasks | | | | | | | 0.62 | -0.36 – 1.60 | 0.217 | | | |
| timepoint:G3 | | | | | | | -0.86 | -1.51 – -0.22 | **0.009** | | | |
| G4: 5 tasks | | | | | | | | | | 0.11 | -0.97 – 1.19 | 0.839 |
| timepoint:G4 | | | | | | | | | | -0.82 | -1.54 – -0.10 | **0.025** |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 1.10 | | | 1.16 | | | 1.12 | | | 1.14 | | |
| $\tau_{00}$ | 4.08 record_id | | | 4.06 record_id | | | 4.08 record_id | | | 4.05 record_id | | |
| ICC | 0.79 | | | 0.78 | | | 0.78 | | | 0.78 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.013 / 0.790 | | | 0.005 / 0.779 | | | 0.011 / 0.787 | | | 0.010 / 0.783 | | |

**Table 19**

*Multilevel Models for Post and Follow-Up SIPDU Scores*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 0.81 | -0.12 – 1.75 | 0.089 | 0.79 | -0.13 – 1.71 | 0.094 | 0.77 | -0.05 – 1.60 | 0.067 | 0.94 | 0.23 – 1.64 | **0.010** |
| timepoint | -0.26 | -0.73 – 0.21 | 0.282 | -0.25 | -0.71 – 0.21 | 0.291 | -0.14 | -0.56 – 0.27 | 0.503 | 0.02 | -0.34 – 0.39 | 0.909 |
| G1: Assigned condition | -0.19 | -1.38 – 0.99 | 0.750 | | | | | | | | | |
| timepoint:G1 | 0.64 | 0.04 – 1.23 | **0.037** | | | | | | | | | |
| G2: Any tasks | | | | -0.15 | -1.33 – 1.03 | 0.804 | | | | | | |
| timepoint:G2 | | | | 0.64 | 0.04 – 1.23 | **0.035** | | | | | | |
| G3: 4 tasks | | | | | | | -0.15 | -1.30 – 1.00 | 0.798 | | | |
| timepoint:G3 | | | | | | | 0.55 | -0.03 – 1.13 | 0.065 | | | |
| G4: 5 tasks | | | | | | | | | | -0.70 | -1.90 – 0.51 | 0.256 |
| timepoint:G4 | | | | | | | | | | 0.34 | -0.28 – 0.96 | 0.285 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.78 | | | 0.78 | | | 0.79 | | | 0.82 | | |
| $\tau_{00}$ | 5.40 record_id | | | 5.39 record_id | | | 5.39 record_id | | | 5.32 record_id | | |
| ICC | 0.87 | | | 0.87 | | | 0.87 | | | 0.87 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.005 / 0.874 | | | 0.006 / 0.874 | | | 0.004 / 0.872 | | | 0.012 / 0.868 | | |

**Exploratory Aim**

Multilevel modeling analyses were conducted for the exploratory aim to compare the identity-specific and general interventions. Across all multilevel analyses, no significant interactions emerged, suggesting that patterns of changes in outcomes did not significantly differ between intervention conditions. Effective sample sizes ranged from $N = 28.04$ (Power = .508) to $N = 32.72$ (Power = .602) for analyses comparing baseline and post-intervention assessments and from $N = 24.06$ (Power = .425) to $N = 26.95$ (Power = .487) for analyses comparing post-intervention and one-month follow-up assessments, meaning all analyses lacked sufficient power. Regression results are available in Supplementary Tables 1 – 12 (Appendix A).

**Chapter 4. Discussion**

As previously stated, sexual minorities are at risk for worse mental health, physical health, and health-related behavioral outcomes (Branstrom et al., 2016; Kerridge et al., 2017). Strengths and strengths-based interventions are one potential avenue for counteracting these worse outcomes (Job & Williams, 2020). This study compared two positive psychology interventions to a nonactive control group regarding depressive symptoms, anxiety symptoms, well-being, self-rated health, problematic drinking, and problems associated with drug use.

**Hypothesis 1**

Hypothesis 1 stated that participants in the intervention conditions would have greater improvements in depressive symptoms, anxiety symptoms, and well-being. This hypothesis was partially supported in that participants in intervention conditions had greater improvements in well-being, but there were no significant differences in depressive symptoms or anxiety symptoms. With respect to well-being, the current study's results align with a general trend of positive psychology interventions improving well-being. Interventions featuring optimism tasks (Coelhoso et al., 2019; Manicavasagar et al., 2014), self-compassion tasks (Ivtzan et al., 2016), positive relationships (Ivtzan et al., 2016; Manicavasagar et al., 2014), and general character strengths (Manicavasagar et al., 2014; Mitchell et al., 2009) have all been shown to improve well-being. The current study's findings suggest that these improvements may also apply to sexual minorities.

In contrast, findings regarding depressive and anxiety symptoms differ from previous studies finding that positive psychology interventions improve these mental health outcomes. For instance, interventions that included similar tasks, like optimism (Hanson, 2018) or letters of forgiveness (Goodmon et al., 2016) improved depressive symptoms, and an intervention

including character strengths and relationship-building improved depressive and anxiety symptoms (Antoine et al., 2018). In the current study, participants from both intervention groups saw improvements in depressive and anxiety symptoms at the post-intervention assessment. However, participants in the control group had more frequent depressive symptoms and more severe anxiety symptoms initially, and these symptoms also improved as the study progressed. When comparing depressive symptoms at post-intervention and one-month follow-up, symptoms for participants in the control condition even improved significantly more than participants in the intervention conditions. This could have possibly happened due to regression to the mean or because of history effects detailed in the limitations section. Thus, this could have obscured significant improvements as a result of the intervention. Alternatively, this could indicate that the effects of the intervention were not strong enough to counteract the impacts of current life contexts (e.g. pandemic-related stress) or minority stress.

**Hypothesis 2**

Hypothesis 2 stated that participants in intervention conditions would experience a greater improvement in self-rated health in comparison to the nonactive control group. This hypothesis was supported. When accounting for whether participants actually participated in the intervention, participants in intervention conditions showed improvements in self-rated health, whereas self-rated health among participant in the control condition got worse, suggesting that results emerged due to writing tasks rather than arbitrary differences based on random assignment. Though previous online positive psychology interventions did not specifically measure self-rated health, the results of the current study are in line with previous positive psychology interventions that have improved perceived bodily pain among primary care patients (Lambert D'raven et al., 2015), patients with chronic illnesses (Muller et al., 2016), and the

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general public (Hausmann et al., 2014). These results and previous studies suggest that positive psychology interventions could generally benefit physical health, both among the general public and among sexual minorities.

**Hypothesis 3**

Hypothesis 3 stated that there would be greater improvements in problematic drinking and problems associated with drug use among participants in the intervention conditions in comparison to those in the control condition. This hypothesis was partially supported. There was no evidence of an intervention effect on problematic drinking. However, results showed that participants in the intervention conditions had greater reductions in problems associated with drug use in comparison to those in the control condition. Further, analyses comparing problems associated with drug use at post-intervention and one-month follow-up showed that participants in the intervention conditions had significantly more increases in problems associated with drug use in comparison to participants in the control group, which would suggest that treatment effects are short-term. However, this finding was no longer significant when adjusting for meaningful participation with intervention tasks, suggesting that it is possible that treatment effects did last through the one-month follow-up.

Like the current study's results, findings from other studies have been mixed. For instance, Torniainen-Holm and colleagues (2016) found that an intervention featuring optimism and forgiveness tasks decreased binge drinking two years after the intervention. Additionally, interventions encouraging relishing in positive emotions have shown to benefit the mental health of patients in substance use recovery (Hoeppner et al., 2019) but have no effect on patients with alcohol use disorder (Krentzmen et al., 2015). Thus, this could suggest that studies examining the impact of positive psychology interventions on substance use require more extended follow-up

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(such as up to two years, as with Torniainen-Holm et al., 2016) to determine whether the intervention was effective, as substance use recovery is a long and arduous process. Alternatively, the results could instead suggest that positive psychology interventions alone are not substantive enough to improve substance use outcomes and may require integration with other interventions that aid in recovery from substance use.

**Exploratory Aim**

The exploratory aim was to compare the two positive psychology intervention conditions in terms of their effects on mental health, physical health, and substance use outcomes. No analyses demonstrated a significant difference between the interventions. However, power analyses showed that all analyses regarding this aim were not sufficiently powered. Thus, it is difficult to draw conclusions regarding this aim.

**Implications**

First, implications can be drawn from analyses of intervention effects. Should further research continue to find similar results as the current study, positive psychology writing tasks could be utilized by therapists, counselors and other clinicians when working with their sexual minority clients. These could be assigned to clients for in-person use, or it could be easily implemented for use by telehealth providers, making it especially useful in the context of the ongoing COVID-19 pandemic. Availability of the intervention tasks could also be made more accessible by being posted on websites for college campuses, counseling centers and clinics, as well as other websites related to sexual minority health.

Nonsignificant findings from analyses comparing the two interventions should be interpreted with caution, as these analyses lacked sufficient power. Nonetheless, it is possible that these nonsignificant findings have implications. For example, findings could imply that

tailoring positive psychology tasks to include sexual minority experiences is unnecessary, and that therapists can simply incorporate strengths-based activities into practice with sexual minorities without alteration. Alternatively, it is possible that there was a Type II error for tailoring of the efficacy of the intervention, and if this were the case, then it would imply that tailoring should be used in future studies. Previous literature may help inform these potential implications. Despite the existence of interventions tailored to sexual minority experiences (e.g. Eliason et al., 2012; Nyamathi et al., 2017), no study demonstrates that tailoring to sexual minority experiences make interventions more effective for sexual minorities. Further, one smoking cessation intervention that included no tailoring showed similar efficacy among sexual minorities as it did heterosexual individuals (Vogel et al., 2019), meaning that for some interventions, not tailoring interventions does not reduce its efficacy with sexual minorities. However, qualitative studies have shown that groups of lesbian and bisexual women (McElroy et al., 2016), seropositive men who have sex with men (Vanable et al., 2011), and same-sex couples (Pepping et al., 2017) have expressed a desire for interventions to speak to their lived experiences. Thus, while it is still to be determined whether tailoring can increase efficacy, there is certainly evidence to suggest that tailoring may be preferred by sexual minority participants.

Finally, findings from this study could also apply to other stigmatized populations. Previous research has shown that similar interventions have been useful to participants with HIV, diabetes and other chronic illnesses (Boselie et al., 2018; Cohn et al., 2014; Drozd et al., 2014; Horvath et al., 2013; Muller et al., 2016; Peters et al., 2017) and women with body image issues (Stern & Engeln, 2018; Ziemer et al., 2018). Thus, it is reasonable to suggest that similar interventions may be useful among groups such as gender minorities, people of color, or people in polyamorous or non-monogamous relationships. Furthermore, this study could provide a

foundation for intersectional examinations of positive psychology interventions. As previously

mentioned, Job and Williams (2020) conducted a systematic review examining positive

psychology interventions and found that not only were sexual and gender minorities

underexamined, but racial minorities were as well. Moreover, racial minorities are

underrepresented in the greater body of sexual and gender minority research, and thus, the

development of the current study's intervention could be biased by what is more so effective for

white sexual minorities. Therefore, this intervention could be used to empirically examine this

question in future studies, which will provide us with greater knowledge about strengths-based

interventions with sexual minorities of color. Thus, additional research will be necessary to

determine which positive psychology constructs would work best for different stigmatized

populations and intersections within those populations.

**Limitations and Future Directions**

*Power, Sample Size, and Retention*

Though there was sufficient power for analyses comparing baseline and post-intervention

outcomes for participants in the control and interventions, all other analyses lacked the power

necessary to draw conclusions. This increases the risk of a Type II error, which, in the case of

analyses comparing post-intervention and one-month follow-up scores, could obscure significant

findings suggesting that the intervention effects only last for a shorter amount of time. In the case

of analyses comparing the identity-specific and general positive psychology interventions, low

power increases the risk of Type II errors obscuring potential differences in effectiveness of the

interventions. Thus, it is possible that that tailoring intervention tasks to include minority stress

experiences could make tasks more or less effective than standard positive psychology writing

tasks. Thus, future research should continue to examine this research question with interventions for sexual minorities.

Future research can improve upon the current study and address this limitation in two ways: by improving retention rates and by increasing initial sample size. Increasing retention rates would help with determining how long intervention effects last, as analyses for later timepoints were slightly underpowered. Estrada and colleagues (2014) suggest that there are four main components that are key to retaining participants in longitudinal studies: compensation (i.e. amount and timing of compensation; using prepayments rather than post-payments to establish trust), communication (i.e. being accessible to participants, having multiple modes of contact, personalized messages), consistency (i.e. consistent messaging and branding of the study), and creditability (i.e. creditability of the researcher, research study, and study tasks). With these aspects in mind, the current study was identical to the pilot study with the exception of compensation methods. The pilot study included larger and guaranteed payments based on task completion, whereas the current study featured lottery payments. Thus, retention rates can be improved through more favorable incentives, such as guaranteed payments rather than lottery payments, and paying participants before tasks rather than after. By increasing initial sample size for intervention conditions, future research can dramatically increase power for comparisons between intervention conditions. Additionally, increasing initial sample size may counteract attrition for later assessments in the study.

### *Length of Follow-Up*

In addition to needing increased retention during the one-month follow-up, the current study is also limited in length of extended follow-up. Per a systematic review of online positive psychology interventions (Job & Williams, 2020), lack of extended follow-up is a limitation

present among many positive psychology interventions. Future research monitor participants from a randomized control trial for longer periods of follow-up (e.g. three months, six months, twelve months) to determine how long treatment effects last. This could also help provide recommendations for how often clinicians ask their clients to complete the intervention tasks.

### *Low AUDIT and SIPDU Scores*

Both AUDIT and SIPDU were already low at baseline assessments. For AUDIT scores, a score of eight indicates problematic drinking. Only ten participants reached this threshold, meaning that 87.8% did not use alcohol problematically. Similarly, only fourteen participants endorsed having any problem associated with drug use, meaning 83.1% experience no problems associated with drug use. This appears to be similar to rates found among the United States population. The 2019 National Survey on Drug Use and Health suggests that only 6.3% of United States adults have consumed heavy amounts of alcohol in the past four weeks, and that only 3% of United States citizens aged twelve and older met the criteria for an illicit drug use disorder (National Institute on Alcohol Abuse and Alcoholism, 2021; Substance Abuse and Mental Health Services Administration, 2020). Nevertheless, future studies should pre-screen for alcohol and drug use, so that researchers may determine whether positive psychology interventions can effectively reduce alcohol and drug use among sexual minorities at risk for substance use disorders.

### *Individual Task Efficacies*

The current study showed that a combination of positive psychology tasks (self-compassion, forgiveness, optimism, humor, and social support seeking) had a significant effect on outcomes like well-being and self-rated health. However, the current study lacks the ability to clearly demonstrate which tasks were pivotal to this change, and thus, which tasks are most

important to disseminate and include in future interventions. Targeted constructs were chosen based on a systematic review (Job & Williams, 2020), which suggested that the current study's tasks may be the options to tailor for sexual minorities. However, each individual construct has yet to be tested. Because baseline correlational analyses showed that self-compassion, optimism, and forgiveness related to depressive symptoms, anxiety symptoms, and well-being, it is possible that these factors may be more effective when targeted in an intervention in comparison to other constructs represented in the current study's intervention (e.g. humor, social support seeking). Some research (Gander et al., 2013) has compared different types of strengths-based interventions among general populations and have found different sizes of effects based on the construct the task elicited, so it is possible that these constructs have differential effects among sexual minorities as well. Thus, future research should experiment with different variations of constructs in interventions for sexual minorities to see which combination of tasks are most effective.

### History Effects

Given that the current study was conducted from October 2020 to February 2021, there are several major historical events that could have potentially affected participants' health outcomes. These include the ongoing COVID-19 pandemic, the 2020 Presidential election, and the January 6th attack on the United States Capitol building. Each of events could have potentially contributed to significant fluctuations of depressive symptoms, anxiety symptoms, well-being, and problems associated with drug use among participants in the control conditions. These events could have also hindered or exacerbated changes found in the intervention conditions. Thus, additional trials examining positive psychology interventions with a sexual minority samples should be conducted in the future to see if similar results are found.

**COVID-19 Pandemic**. The unprecedented COVID-19 pandemic has been demonstrated to have a deleterious effect on mental health outcomes among the general population (Twenge & Joiner, 2020), potentially due to increased health-related anxiety (Son et al., 2020) and isolation (Gloster et al., 2020). Recent data suggests that sexual minorities may be more vulnerable during this time. In a longitudinal study of 707 United States college students (Hoyt et al. 2021), heterosexual individuals, on average, experienced clinically mild anxiety during April and July 2020, whereas sexual minorities experienced clinically moderate anxiety. In another sample of 170 adults, sexual minorities experienced significantly more psychological distress and peritraumatic stress (i.e. stress occurring during a traumatic event; Peterson et al., 2020). Moreover, a descriptive study of 1380 United States adults demonstrated that in comparison to straight/cisgender participants, sexual and gender minorities experienced a higher number of COVID-related symptoms, had a higher risk of clinically significant depression and anxiety, and a higher risk of experiencing job loss or financial difficulties due to the COVID-19 pandemic (Moore et al., 2021). Finally, in a study of 477 sexual minority men, 85% reported that COVID-19-related worries contributed to worse sleep, and higher frequency of these worries inhibiting sleep corresponded with worse depression and anxiety (Millar, 2020).

One factor that may contribute to this disparity among young sexual minorities is lack of support from family members that they are resigned to quartering with during the pandemic. Qualitative findings from a sample of sexual minority youths indicated that being "stuck" at home with homophobic parents was an added stressor during the pandemic, as well as reduced access to LGBTQ-friendly groups, like gender and sexuality alliances (GSAs; Fish et al., 2020). These results were mirrored by survey responses among sexual and gender minority college students, which showed that almost half (45.7%) of participants had a lack of support within

their immediate family; this corresponded with a significantly higher risk for frequent mental distress (Gonzales et al., 2020). For sexual minority adults, isolation may explain worse mental health outcomes. For instance, physical distancing and stay-at-home orders were associated with higher odds of anxiety and loneliness during the pandemic among a sample of men who have sex with men (Holloway et al., 2021). Furthermore, significantly different levels of psychological distress between sexual minority and heterosexual adults became nonsignificant when accounting for childhood trauma and living alone during the pandemic (Peterson et al., 2020). With the age range of the current sample (18-51 years old), it is likely that many participants were experiencing some stressors related to COVID-19, from either quarantining with unsupportive people or from isolation and social distancing; therefore, it is possible that this could have had an effect on their mental health outcomes throughout their participation. In particular, this could have blunted intervention effects for depressive and anxiety outcomes, since the pandemic has consistently been shown to affect these outcomes. Additionally, it is possible that intervention and control conditions were impacted differentially by the COVID-19 pandemic in ways that were not measured (e.g. living with unsupportive people, being essential workers, etc.). Therefore, another trial of the current study may be necessary to see if results are similar after the COVID-19 pandemic is over.

   **2020 Presidential Election**. Like the COVID-19 pandemic, it is possible that participants' mental health was affected by the 2020 Presidential Election. Presently, there are no published studies examining sexual minority health as it relates to the 2020 elections. However, data from past elections that feature anti-LGBTQ+ policies or politicians can illuminate the ways in which this event could have affected some of the participants' results. During elections featuring anti-LGBTQ+ policies, exposure to negative messages about the LGBTQ+ community

has been associated with increased psychological distress and negative affect (Frost & Fingerhut, 2016; Rostosky et al., 2009). Though not the focus of the 2020 election, reducing personal freedom for sexual and gender minorities was a perpetual threat under the Trump administration. During 2020 alone, attempts were made to repeal nondiscrimination policies in the Affordable Care Act and regulations for homeless shelters, and Supreme Court Justice Amy Coney Barrett, a candidate with a history of anti-LGBTQ+ public statement, was nominated and confirmed (Cahill & Pettus, 2020). Thus, the anticipation of more anti-LGBTQ+ policies could have contributed to worse mental health leading up to the election, and because it was unmeasured in the current study, it is unknown whether this was experienced differentially by condition.

Furthermore, research from the 2016 presidential election showed the negative effects that the election of Donald Trump had on sexual minorities. Sexual minorities often reported fears about legal rights being taken away from them, fears about physical safety, and increased hypervigilance around others (Brown & Keller, 2018; Drabble et al., 2018; Veldhuis et al., 2018). Additionally, a longitudinal study showed that compared to before the election, participants reported increased depressive and anxiety symptoms after the election (Gonzalez et al., 2018). Thus, it is possible that former President Donald Trump's loss may have benefitted health outcomes of the current study's participants.

**United States Capitol Attack**. While there are currently no published studies regarding how the Capitol attack may have affected health outcomes, studies featuring responses to other domestic terror attacks may illuminate how the attack on the United States Capitol could have affected the current study's results. Stress associated with the 9/11 attacks predicted depression and anxiety among college students who were not present at the location of the attacks (MacGeorge et al., 2007). A study with a national sample showed that being exposed at least

four hours daily to 9/11 media coverage after the attacks increased the risk of high stress in the weeks following the attacks and also increased the risk of health issues two to three years later (Cohen Silver et al., 2013). Similarly, more media exposure to the Boston Marathon Bombing significantly predicted acute stress symptoms (Holman et al., 2014). While it is unknown how much media coverage of the Capitol attack was consumed by the current study's participants, it is possible that this could have had a negative effect on mental health outcomes and that media exposure could have been consumed at different levels based on condition.

**Conclusion**

The current study aimed to compare positive psychology interventions to a non-active control to see if this could potentially address health disparities among sexual minorities. Though results were mixed in terms of effects on mental health and substance use outcomes, the results of the current study show that positive psychology interventions have the potential of benefitting sexual minority health. More research regarding positive psychology interventions is needed to determine how useful they are in eliminating disparities, as this type of intervention can be easily disseminated through counseling centers and online resources.

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Appendix A: Supplementary Tables

**Supplementary Table 1**

*Multilevel Models for Baseline and Post CESD Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Est | CI | p | Est | CI | p | Est | CI | p | Est | CI | p |
| (Intercept) | 24.52 | 19.67 – 29.37 | **<0.001** | 16.69 | 5.93 – 27.44 | **0.002** | 24.13 | 16.96 – 31.30 | **<0.001** | 23.13 | 17.56 – 28.70 | **<0.001** |
| timepoint | -3.56 | -6.33 – -0.78 | **0.012** | -3.56 | -6.33 – -0.78 | **0.012** | -3.56 | -6.33 – -0.78 | **0.012** | -3.56 | -6.33 – -0.78 | **0.012** |
| type of intervention | -2.06 | -8.98 – 4.87 | 0.561 | -1.38 | -8.26 – 5.50 | 0.694 | -2.07 | -9.06 – 4.92 | 0.561 | -2.37 | -9.33 – 4.58 | 0.504 |
| timepoint:intervent. | 2.79 | -1.17 – 6.75 | 0.168 | 2.79 | -1.17 – 6.75 | 0.168 | 2.79 | -1.17 – 6.75 | 0.168 | 2.79 | -1.17 – 6.75 | 0.168 |
| G2: Any tasks | | | | 8.46 | -1.94 – 18.86 | 0.111 | | | | | | |
| G3: 4 tasks | | | | | | | 0.56 | -6.89 – 8.00 | 0.884 | | | |
| G4: 5 tasks | | | | | | | | | | 3.41 | -3.29 – 10.10 | 0.319 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 27.03 | | | 27.03 | | | 27.03 | | | 27.03 | | |
| $\tau_{00}$ | 138.38 record_id | | | 133.92 record_id | | | 141.35 record_id | | | 138.39 record_id | | |
| ICC | 0.84 | | | 0.83 | | | 0.84 | | | 0.84 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.011 / 0.838 | | | 0.053 / 0.841 | | | 0.011 / 0.841 | | | 0.028 / 0.841 | | |

**Supplementary Table 2**

*Multilevel Models for Post and Follow-Up CESD Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 21.38 | 15.87 – 26.88 | **<0.001** | 11.90 | -13.24 – 37.03 | 0.354 | 25.03 | 15.53 – 34.53 | **<0.001** | 19.38 | 12.71 – 26.05 | **<0.001** |
| timepoint | 0.21 | -4.03 – 4.44 | 0.923 | 0.21 | -4.03 – 4.44 | 0.923 | 0.21 | -4.03 – 4.44 | 0.923 | 0.21 | -4.03 – 4.44 | 0.923 |
| Type of intervention | 1.67 | -6.39 – 9.74 | 0.684 | 1.26 | -6.91 – 9.43 | 0.762 | 1.98 | -6.13 – 10.08 | 0.633 | 1.20 | -6.91 – 9.31 | 0.772 |
| timepoint:intervent. | 1.32 | -4.89 – 7.52 | 0.678 | 1.32 | -4.89 – 7.52 | 0.678 | 1.32 | -4.89 – 7.52 | 0.678 | 1.32 | -4.89 – 7.52 | 0.678 |
| G2: Any tasks | | | | 9.89 | -15.69 – 35.47 | 0.449 | | | | | | |
| G3: 4 tasks | | | | | | | -4.62 | -14.39 – 5.15 | 0.354 | | | |
| G4: 5 tasks | | | | | | | | | | 3.99 | -3.53 – 11.51 | 0.298 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 56.06 | | | 56.06 | | | 56.06 | | | 56.06 | | |
| $\tau_{00}$ | 133.61 record_id | | | 135.22 record_id | | | 134.14 record_id | | | 133.30 record_id | | |
| ICC | 0.70 | | | 0.71 | | | 0.71 | | | 0.70 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.009 / 0.707 | | | 0.019 / 0.713 | | | 0.025 / 0.712 | | | 0.029 / 0.712 | | |

**Supplementary Table 3**

*Multilevel Models for Baseline and Post BAI Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 18.07 | 13.89 – 22.26 | **<0.001** | 14.49 | 5.08 – 23.89 | **0.003** | 17.64 | 11.47 – 23.81 | **<0.001** | 16.04 | 11.33 – 20.76 | **<0.001** |
| timepoint | -1.63 | -4.16 – 0.90 | 0.206 | -1.63 | -4.16 – 0.90 | 0.206 | -1.63 | -4.16 – 0.90 | 0.206 | -1.63 | -4.16 – 0.90 | 0.206 |
| type of intervention | -2.00 | -7.98 – 3.98 | 0.513 | -1.69 | -7.73 – 4.35 | 0.584 | -2.01 | -8.05 – 4.02 | 0.513 | -2.46 | -8.36 – 3.44 | 0.414 |
| timepoint:intervent. | -0.64 | -4.25 – 2.97 | 0.728 | -0.64 | -4.25 – 2.97 | 0.728 | -0.64 | -4.25 – 2.97 | 0.728 | -0.64 | -4.25 – 2.97 | 0.728 |
| G2: Any tasks | | | | 3.87 | - 5.22 – 12.97 | 0.404 | | | | | | |
| G3: 4 tasks | | | | | | | 0.62 | -5.77 – 7.01 | 0.849 | | | |
| G4: 5 tasks | | | | | | | | | | 4.99 | -0.65 – 10.62 | 0.083 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 22.46 | | | 22.46 | | | 22.46 | | | 22.46 | | |
| $\tau_{00}$ | 100.79 record_id | | | 101.46 record_id | | | 102.95 record_id | | | 96.56 record_id | | |
| ICC | 0.82 | | | 0.82 | | | 0.82 | | | 0.81 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.019 / 0.821 | | | 0.030 / 0.824 | | | 0.019 / 0.824 | | | 0.067 / 0.824 | | |

**Supplementary Table 4**

*Multilevel Models for Post and Follow-Up BAI Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 16.83 | 11.95 – 21.72 | **<0.001** | 9.04 | -14.03 – 32.11 | 0.442 | 18.86 | 10.19 – 27.54 | **<0.001** | 13.76 | 7.91 – 19.60 | **<0.001** |
| timepoint | -1.08 | -3.93 – 1.76 | 0.456 | -1.08 | -3.93 – 1.76 | 0.456 | -1.08 | -3.93 – 1.76 | 0.456 | -1.08 | -3.93 – 1.76 | 0.456 |
| Type of intervention | -2.02 | -9.17 – 5.12 | 0.579 | -2.36 | -9.62 – 4.89 | 0.523 | -1.86 | -9.08 – 5.37 | 0.615 | -2.76 | -9.79 – 4.28 | 0.442 |
| timepoint:intervent. | 0.32 | -3.84 – 4.49 | 0.880 | 0.32 | -3.84 – 4.49 | 0.880 | 0.32 | -3.84 – 4.49 | 0.880 | 0.32 | -3.84 – 4.49 | 0.880 |
| G2: Any tasks | | | | 8.13 | -15.39 – 31.65 | 0.498 | | | | | | |
| G3: 4 tasks | | | | | | | -2.57 | -11.59 – 6.46 | 0.577 | | | |
| G4: 5 tasks | | | | | | | | | | 6.16 | -0.59 – 12.90 | 0.074 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 25.30 | | | 25.30 | | | 25.30 | | | 25.30 | | |
| $\tau_{00}$ | 123.66 $_{record\_id}$ | | | 125.39 $_{record\_id}$ | | | 125.88 $_{record\_id}$ | | | 117.02 $_{record\_id}$ | | |
| ICC | 0.83 | | | 0.83 | | | 0.83 | | | 0.82 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.007 / 0.831 | | | 0.016 / 0.835 | | | 0.013 / 0.835 | | | 0.068 / 0.834 | | |

**Supplementary Table 5**

*Multilevel Models for Baseline and Post Well-Being Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 5.12 | 4.67 – 5.57 | **<0.001** | 5.45 | 4.43 – 6.47 | **<0.001** | 4.71 | 4.06 – 5.36 | **<0.001** | 4.94 | 4.43 – 5.45 | **<0.001** |
| timepoint | 0.33 | 0.09 – 0.58 | **0.008** | 0.33 | 0.09 – 0.58 | **0.008** | 0.33 | 0.09 – 0.58 | **0.008** | 0.33 | 0.09 – 0.58 | **0.008** |
| type of intervention | -0.13 | -0.78 – 0.51 | 0.682 | -0.16 | -0.82 – 0.49 | 0.624 | -0.15 | -0.78 – 0.48 | 0.642 | -0.18 | -0.82 – 0.47 | 0.592 |
| timepoint:intervent. | -0.09 | -0.44 – 0.26 | 0.623 | -0.09 | -0.44 – 0.26 | 0.623 | -0.09 | -0.44 – 0.26 | 0.623 | -0.09 | -0.44 – 0.26 | 0.623 |
| G2: Any tasks | | | | -0.36 | -1.35 – 0.63 | 0.481 | | | | | | |
| G3: 4 tasks | | | | | | | 0.59 | -0.09 – 1.26 | 0.089 | | | |
| G4: 5 tasks | | | | | | | | | | 0.44 | -0.18 – 1.06 | 0.163 |

**Random Effects**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\sigma^2$ | 0.21 | | | 0.21 | | | 0.21 | | | 0.21 | | |
| $\tau_{00}$ | 1.22 record_id | | | 1.23 record_id | | | 1.17 record_id | | | 1.20 record_id | | |
| ICC | 0.85 | | | 0.85 | | | 0.85 | | | 0.85 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.020 / 0.854 | | | 0.029 / 0.857 | | | 0.067 / 0.856 | | | 0.053 / 0.857 | | |

## Supplementary Table 6

*Multilevel Models for Post and Follow-Up Well-Being Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 5.44 | 4.95 – 5.93 | **<0.001** | 5.82 | 3.59 – 8.05 | **<0.001** | 4.79 | 3.97 – 5.60 | **<0.001** | 5.32 | 4.72 – 5.91 | **<0.001** |
| timepoint | -0.39 | -0.77 – 0.00 | 0.050 | -0.39 | -0.77 – 0.00 | 0.050 | -0.39 | -0.77 – 0.00 | 0.050 | -0.39 | -0.77 – 0.00 | 0.050 |
| Type of intervention | -0.17 | -0.88 – 0.55 | 0.642 | -0.15 | -0.88 – 0.57 | 0.680 | -0.22 | -0.92 – 0.48 | 0.531 | -0.20 | -0.92 – 0.52 | 0.590 |
| timepoint:intervent. | 0.27 | -0.30 – 0.83 | 0.354 | 0.27 | -0.30 – 0.83 | 0.354 | 0.27 | -0.30 – 0.83 | 0.354 | 0.27 | -0.30 – 0.83 | 0.354 |
| G2: Any tasks | | | | -0.40 | -2.67 – 1.87 | 0.732 | | | | | | |
| G3: 4 tasks | | | | | | | 0.82 | -0.02 – 1.65 | 0.054 | | | |
| G4: 5 tasks | | | | | | | | | | 0.24 | -0.42 – 0.91 | 0.474 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.47 | | | 0.47 | | | 0.47 | | | 0.47 | | |
| $\tau_{00}$ | 1.03 record_id | | | 1.05 record_id | | | 0.95 record_id | | | 1.04 record_id | | |
| ICC | 0.69 | | | 0.69 | | | 0.67 | | | 0.69 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.015 / 0.692 | | | 0.016 / 0.698 | | | 0.078 / 0.697 | | | 0.024 / 0.698 | | |

# Supplementary Table 7

*Multilevel Models for Baseline and Post Self-Rated Health Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.74 | 2.42 – 3.06 | **<0.001** | 2.61 | 1.92 – 3.31 | **<0.001** | 2.94 | 2.48 – 3.39 | **<0.001** | 2.85 | 2.49 – 3.21 | **<0.001** |
| timepoint | -0.15 | -0.42 – 0.12 | 0.286 | -0.15 | -0.42 – 0.12 | 0.286 | -0.15 | -0.42 – 0.12 | 0.286 | -0.15 | -0.42 – 0.12 | 0.286 |
| type of intervention | -0.01 | -0.47 – 0.45 | 0.966 | 0.00 | -0.46 – 0.46 | 0.997 | -0.00 | -0.46 – 0.45 | 0.992 | 0.02 | -0.44 – 0.47 | 0.947 |
| timepoint:intervent. | -0.12 | -0.51 – 0.27 | 0.541 | -0.12 | -0.51 – 0.27 | 0.541 | -0.12 | -0.51 – 0.27 | 0.541 | -0.12 | -0.51 – 0.27 | 0.541 |
| G2: Any tasks | | | | 0.14 | -0.53 – 0.80 | 0.685 | | | | | | |
| G3: 4 tasks | | | | | | | -0.28 | -0.74 – 0.18 | 0.232 | | | |
| G4: 5 tasks | | | | | | | | | | -0.28 | -0.69 – 0.14 | 0.192 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.26 | | | 0.26 | | | 0.26 | | | 0.26 | | |
| $\tau_{00}$ | 0.46 record_id | | | 0.47 record_id | | | 0.45 record_id | | | 0.45 record_id | | |
| ICC | 0.64 | | | 0.64 | | | 0.64 | | | 0.63 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.018 / 0.645 | | | 0.020 / 0.650 | | | 0.039 / 0.650 | | | 0.043 / 0.650 | | |

**Supplementary Table 8**

*Multilevel Models for Post and Follow-Up Self-Rated Health Scores for Interventions Only*

| | **Model 1** | | | **Model 2** | | | **Model 3** | | | **Model 4** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.50 | 2.13 – 2.87 | **<0.001** | 2.90 | 1.19 – 4.60 | **0.001** | 3.08 | 2.46 – 3.69 | **<0.001** | 2.67 | 2.22 – 3.12 | **<0.001** |
| timepoint | 0.21 | -0.09 – 0.50 | 0.165 | 0.21 | -0.09 – 0.50 | 0.165 | 0.21 | -0.09 – 0.50 | 0.165 | 0.21 | -0.09 – 0.50 | 0.165 |
| Type of intervention | -0.02 | -0.57 – 0.52 | 0.932 | -0.01 | -0.56 – 0.55 | 0.981 | 0.02 | -0.50 – 0.55 | 0.929 | 0.02 | -0.53 – 0.56 | 0.954 |
| timepoint:intervent. | -0.02 | -0.45 – 0.41 | 0.935 | -0.02 | -0.45 – 0.41 | 0.935 | -0.02 | -0.45 – 0.41 | 0.935 | -0.02 | -0.45 – 0.41 | 0.935 |
| G2: Any tasks | | | | -0.41 | -2.15 – 1.32 | 0.640 | | | | | | |
| G3: 4 tasks | | | | | | | -0.73 | -1.36 – -0.10 | **0.023** | | | |
| G4: 5 tasks | | | | | | | | | | -0.34 | -0.84 – 0.17 | 0.191 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.27 | | | 0.27 | | | 0.27 | | | 0.27 | | |
| $\tau_{00}$ | 0.60 record_id | | | 0.61 record_id | | | 0.54 record_id | | | 0.59 record_id | | |
| ICC | 0.69 | | | 0.69 | | | 0.67 | | | 0.69 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.012 / 0.694 | | | 0.016 / 0.700 | | | 0.099 / 0.698 | | | 0.043 / 0.699 | | |

**Supplementary Table 9**

*Multilevel Models for Baseline and Post AUDIT Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.44 | 1.04 – 3.85 | **0.001** | 0.39 | -2.77 – 3.55 | 0.810 | 1.72 | -0.35 – 3.80 | 0.103 | 2.50 | 0.87 – 4.13 | **0.003** |
| timepoint | -0.44 | -1.09 – 0.20 | 0.180 | -0.44 | -1.09 – 0.20 | 0.180 | -0.44 | -1.09 – 0.20 | 0.180 | -0.44 | -1.09 – 0.20 | 0.180 |
| type of intervention | 0.94 | -1.06 – 2.94 | 0.357 | 1.12 | -0.88 – 3.11 | 0.273 | 0.91 | -1.09 – 2.92 | 0.372 | 0.95 | -1.08 – 2.98 | 0.357 |
| timepoint:intervent. | 0.02 | -0.91 – 0.95 | 0.964 | 0.02 | -0.91 – 0.95 | 0.964 | 0.02 | -0.91 – 0.95 | 0.964 | 0.02 | -0.91 – 0.95 | 0.964 |
| G2: Any tasks | | | | 2.22 | -0.84 – 5.29 | 0.155 | | | | | | |
| G3: 4 tasks | | | | | | | 1.02 | -1.14 – 3.19 | 0.354 | | | |
| G4: 5 tasks | | | | | | | | | | -0.13 | -2.11 – 1.85 | 0.898 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 1.48 | | | 1.48 | | | 1.48 | | | 1.48 | | |
| $\tau_{00}$ | 12.32 record_id | | | 12.07 record_id | | | 12.36 record_id | | | 12.58 record_id | | |
| ICC | 0.89 | | | 0.89 | | | 0.89 | | | 0.89 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.020 / 0.895 | | | 0.054 / 0.897 | | | 0.034 / 0.897 | | | 0.020 / 0.897 | | |

# Supplementary Table 10

*Multilevel Models for Post and Follow-Up AUDIT Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 2.13 | 0.85 – 3.40 | **0.001** | 0.06 | -6.05 – 6.18 | 0.984 | 2.00 | -0.30 – 4.30 | 0.088 | 2.60 | 1.03 – 4.17 | **0.001** |
| timepoint | -0.12 | -0.74 – 0.49 | 0.692 | -0.12 | -0.74 – 0.49 | 0.692 | -0.12 | -0.74 – 0.49 | 0.692 | -0.12 | -0.74 – 0.49 | 0.692 |
| Type of intervention | 1.07 | -0.80 – 2.93 | 0.264 | 0.98 | -0.92 – 2.87 | 0.314 | 1.06 | -0.84 – 2.95 | 0.275 | 1.18 | -0.70 – 3.06 | 0.220 |
| timepoint:intervent. | -0.78 | -1.68 – 0.12 | 0.091 | -0.78 | -1.68 – 0.12 | 0.091 | -0.78 | -1.68 – 0.12 | 0.091 | -0.78 | -1.68 – 0.12 | 0.091 |
| G2: Any tasks | | | | 2.15 | -4.09 – 8.39 | 0.499 | | | | | | |
| G3: 4 tasks | | | | | | | 0.16 | -2.25 – 2.56 | 0.898 | | | |
| G4: 5 tasks | | | | | | | | | | -0.94 | -2.78 – 0.89 | 0.313 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 1.19 | | | 1.19 | | | 1.19 | | | 1.19 | | |
| $\tau_{00}$ | 9.00 record_id | | | 9.12 record_id | | | 9.22 record_id | | | 8.99 record_id | | |
| ICC | 0.88 | | | 0.88 | | | 0.89 | | | 0.88 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.021 / 0.885 | | | 0.029 / 0.888 | | | 0.020 / 0.888 | | | 0.041 / 0.888 | | |

**Supplementary Table 11**

*Multilevel Models for Baseline and Post SIPDU Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 0.78 | -0.13 – 1.69 | 0.094 | 1.25 | -0.81 – 3.31 | 0.235 | 0.75 | -0.60 – 2.09 | 0.278 | 1.01 | -0.03 – 2.06 | 0.058 |
| timepoint | -0.15 | -0.66 – 0.36 | 0.568 | -0.15 | -0.66 – 0.36 | 0.568 | -0.15 | -0.66 – 0.36 | 0.568 | -0.15 | -0.66 – 0.36 | 0.568 |
| type of intervention | 0.57 | -0.73 – 1.87 | 0.391 | 0.53 | -0.79 – 1.84 | 0.432 | 0.57 | -0.74 – 1.88 | 0.396 | 0.62 | -0.68 – 1.93 | 0.351 |
| timepoint:intervent. | -0.58 | -1.31 – 0.14 | 0.115 | -0.58 | -1.31 – 0.14 | 0.115 | -0.58 | -1.31 – 0.14 | 0.115 | -0.58 | -1.31 – 0.14 | 0.115 |
| G2: Any tasks | | | | -0.51 | -2.51 – 1.49 | 0.617 | | | | | | |
| G3: 4 tasks | | | | | | | 0.05 | -1.35 – 1.44 | 0.949 | | | |
| G4: 5 tasks | | | | | | | | | | -0.58 | -1.84 – 0.68 | 0.371 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.91 | | | 0.91 | | | 0.91 | | | 0.91 | | |
| $\tau_{00}$ | 4.91 record_id | | | 4.99 record_id | | | 5.01 record_id | | | 4.93 record_id | | |
| ICC | 0.84 | | | 0.85 | | | 0.85 | | | 0.84 | | |
| Observations | 106 | | | 106 | | | 106 | | | 106 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.015 / 0.846 | | | 0.019 / 0.849 | | | 0.015 / 0.849 | | | 0.028 / 0.849 | | |

**Supplementary Table 12**

*Multilevel Models for Post and Follow-Up SIPDU Scores for Interventions Only*

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* | *Est* | *CI* | *p* |
| (Intercept) | 0.50 | -0.52 – 1.52 | 0.337 | -0.04 | -4.96 – 4.87 | 0.987 | 0.49 | -1.35 – 2.33 | 0.600 | 0.98 | -0.27 – 2.23 | 0.123 |
| timepoint | 0.08 | -0.40 – 0.56 | 0.734 | 0.08 | -0.40 – 0.56 | 0.734 | 0.08 | -0.40 – 0.56 | 0.734 | 0.08 | -0.40 – 0.56 | 0.734 |
| Type of intervention | 0.26 | -1.23 – 1.75 | 0.731 | 0.24 | -1.28 – 1.76 | 0.759 | 0.26 | -1.25 – 1.78 | 0.735 | 0.38 | -1.12 – 1.87 | 0.621 |
| timepoint:intervent. | 0.63 | -0.07 – 1.33 | 0.079 | 0.63 | -0.07 – 1.33 | 0.079 | 0.63 | -0.07 – 1.33 | 0.079 | 0.63 | -0.07 – 1.33 | 0.079 |
| G2: Any tasks | | | | 0.57 | -4.45 – 5.58 | 0.825 | | | | | | |
| G3: 4 tasks | | | | | | | 0.01 | -1.91 – 1.93 | 0.992 | | | |
| G4: 5 tasks | | | | | | | | | | -0.96 | -2.42 – 0.49 | 0.195 |
| **Random Effects** | | | | | | | | | | | | |
| $\sigma^2$ | 0.72 | | | 0.72 | | | 0.72 | | | 0.72 | | |
| $\tau_{00}$ | 5.78 record_id | | | 5.92 record_id | | | 5.92 record_id | | | 5.68 record_id | | |
| ICC | 0.89 | | | 0.89 | | | 0.89 | | | 0.89 | | |
| Observations | 90 | | | 90 | | | 90 | | | 90 | | |
| Marginal $R^2$ / Conditional $R^2$ | 0.022 / 0.891 | | | 0.022 / 0.894 | | | 0.021 / 0.894 | | | 0.055 / 0.893 | | |

Appendix B: Screening Survey and Contact Information Survey

What is your gender identity?

Man     Woman     Genderqueer   Another identity not listed (specify)

        Do not know     Prefer not to answer

"Transgender/gender non-conforming" describes people whose gender identity or expression is different, at least part of the time, from the sex assigned to them at birth. Do you consider yourself to be transgender/gender non-conforming in any way?

    Yes        No        Do not know        Prefer not to answer

What is your sexual orientation?

| | |
|---|---|
| Lesbian | Queer |
| Gay | Straight/Heterosexual |
| Bisexual | Another sexual orientation not listed |
| Pansexual | (specify) |
| Asexual | Do not know |
| Questioning | Prefer not to answer |

What is your race/ethnicity? (Check all that apply)

| | |
|---|---|
| Alaskan/Native American | Other (specify) |
| African American/Black | |
| Asian | |
| Caucasian/White | |
| Hispanic/Latino/Latina/Latinx | |
| Middle Eastern/North African | |

What is your current age?

Do you currently reside in the United States?

YES

NO

Contact Information Survey

First name _____

Last name _____

Email address _____

Phone number _____

Can we email you?

Yes     No

Can we call you?

Yes     No

Can we text you?

Yes     No

Can we leave you a voicemail?

Yes     No

Comments: _____

Appendix C: Demographics

What is your gender identity?

Man                                              Another identity not listed (specify)

Woman                                            Do not know

Genderqueer                                      Prefer not to answer

"Transgender/gender non-conforming" describes people whose gender identity or expression is

different, at least part of the time, from the sex assigned to them at birth. Do you consider

yourself to be transgender/gender non-conforming in any way?

   Yes        No        Do not know        Prefer not to answer

What is your sexual orientation?

Lesbian                                          Queer

Gay                                              Straight/Heterosexual

Bisexual                                         Another sexual orientation not listed

Pansexual                                        (specify)

Asexual                                          Do not know

Questioning                                      Prefer not to answer

What is your race/ethnicity? (Check all that apply)

Alaskan/Native American                          Hispanic/Latino/Latina/Latinx

African American/Black                           Middle Eastern/North African

Asian                                            Other (specify)

Caucasian/White

What is your current age?

How many years of school did you complete? Mark the highest grade completed

Grade: 7 8 9 10 11 12 or GED equivalent

College: 1 2 3 4 5

Graduate: 1 2 3 4 5 6 7

Appendix D: LGB Identity Scale

For each of the following questions, please mark the response that best indicates your current experience as an LGB person. Please be as honest as possible: Indicate how you really feel now, not how you think you should feel. There is no need to think too much about any one question. Answer each question according to your initial reaction and then move on to the next.

1- Disagree Strongly

2- Disagree

3- Disagree Somewhat

4- Agree Somewhat

5- Agree

6- Agree Strongly

1. I prefer to keep my same-sex romantic relationships rather private. [b]

2. If it were possible, I would choose to be straight. [a]

3. I keep careful control over who knows about my same-sex romantic relationships. [b]

4. I wish I were heterosexual. [a]

5. I believe it is unfair that I am attracted to people of the same sex. [a]

6. My sexual orientation is a personal and private matter. [b]

Note: a indicates items from the internalized homonegativity subscale; b indicates items from the concealment motivation subscale

Appendix E: Everyday Discrimination Scale

Considering your **sexual orientation**, how often do you think the following would occur if people knew about your sexual orientation?

1-Not at all likely   2   3   4   5   6   7-very likely

Not at all likely

Somewhat Unlikely

Slightly Unlikely

Neither Likely nor Unlikely

Slightly Likely

Somewhat Likely

Very Likely


1. People would act as if you are inferior.

2. People would act as if you are not smart.

3. People would act as if they are afraid of you.

4. You would be treated with less courtesy than others.

5. You would be treated with less respect than others.

6. You would receive poor service in stores/restaurants.

7. People would act as if you are dishonest.

8. You would be called names or insulted.

9. You would be threatened or harassed.

Appendix F: Center for Epidemiological Studies Depression Scale

**Source:**

Radloff, L. S. (1977). The CES-D scale a self-report depression scale for research in the general

population. *Applied Psychological Measurement*, *1*(3), 385-401.

Below is a list of the ways you might have felt or behaved. Please tell me how often you have

felt this way during the **past week**.

| | Rarely or none of the time (less than 1 day ) | Some or a little of the time (1-2 days) | Occasionally or a moderate amount of time (3-4 days) | Most or all of the time (5-7 days) |
|---|---|---|---|---|
| 1.  I was bothered by things that usually don't bother me. | | | | |
| 2.  I did not feel like eating; my appetite was poor. | | | | |
| 3.  I felt that I could not shake off the blues even with help from my family or friends. | | | | |
| 4.  I felt I was just as good as other people. | | | | |
| 5.  I had trouble keeping my mind on what I was doing. | | | | |
| 6.  I felt depressed. | | | | |
| 7.  I felt that everything I did was an effort. | | | | |
| 8.  I felt hopeful about the future. | | | | |
| 9.  I thought my life had been a failure. | | | | |
| 10.  I felt fearful. | | | | |
| 11.  My sleep was restless. | | | | |

| | | | | |
|---|---|---|---|---|
| 12. I was happy. | | | | |
| 13. I talked less than usual. | | | | |
| 14. I felt lonely. | | | | |
| 15. People were unfriendly. | | | | |
| 16. I enjoyed life. | | | | |
| 17. I had crying spells. | | | | |
| 18. I felt sad. | | | | |
| 19. I felt that people dislike me. | | | | |
| 20. I could not get "going." | | | | |

**Scoring:** An overall depression score is computed as the sum of the 20 items, with Items 4, 8, 12, and 16 reversed. In cases with internally missing data (items not answered), the sums were computed after imputation of the missing values: # items on scale / # actually answered, multiplied by the sum obtained from the answered items. A higher score indicates more depressive symptomatology during the past week.

Appendix G: Beck Anxiety Inventory

Source:

Beck, A. T., Epstein, N., Brown, G., Steer, R. A. (1988). An inventory for measuring clinical

anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893-897.

Below is a list of common symptoms of anxiety. Please carefully read each item in the list.

Indicate how much you have been bothered by that symptom during the **past week**, including

today, by selecting the number in the corresponding space in the column next to each symptom.

Response options:

0 - Not At All

1 - Mildly but it didn't bother me much

2 - Moderately – it wasn't pleasant at times

3 - Severely – it bothered me a lot

1. Numbness or tingling
2. Feeling hot
3. Wobbliness in legs
4. Unable to relax
5. Fear of the worst happening
6. Dizzy or lightheaded
7. Heart pounding/racing
8. Unsteady
9. Terrified or afraid
10. Nervous
11. Feeling of choking
12. Hands trembling

13. Shaky/unsteady
14. Fear of losing control
15. Difficulty in breathing
16. Fear of dying
17. Scared
18. Indigestion
19. Faint/lightheaded
20. Face flushed
21. Hot/cold sweats

Appendix H: AUDIT

**Alcohol Use Disorders Identification (AUDIT)**

**Source:** Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993).

Development of the alcohol use disorders identification test (AUDIT): WHO collaborative

project on early detection of persons with harmful alcohol consumption-II. *Addiction*, *88*(6),

791-804.

*The following questions ask you about your use of alcoholic beverages <u>during the past three</u>*

*<u>months.</u> For the following questions, 1 Standard Drink = one can, glass, or bottle of beer; one*

*shot of liquor or mixed drink; or one glass of wine.*

1. How often, <u>during the last 3 months</u>, did you have a drink containing alcohol?

  ___ 0)  Never

  ___ 1) Monthly or less

  ___ 2) 2 to 4 times per month

  ___ 3) 2 to 3 times per week

  ___ 4)  4 or more times per week

2**.** How many drinks did you have on a typical day when you were drinking?

  ___ 0) 1-2 drinks

  ___ 1) 3-4 drinks

  ___ 2) 5-6 drinks

  ___ 3) 7-9 drinks

  ___ 4) 10 or more drinks

3. How often did you have 6 or <u>more</u> drinks on one occasion?

  ___0) Never

  ___1) Less than monthly

___2) Monthly

  ___3) Weekly

  ___4) Daily or almost daily

4. How often during the last three months have you found that you were not able to stop drinking once you had started?

     ___0) Never

     ___1) Less than monthly

     ___2) Monthly

     ___3) Weekly

     ___4) Daily or almost daily

5. How often during the last three months have you failed to do what was normally expected from you because of drinking (i.e. work, taking care of your kids, late for appointments, etc.)?

     ___0) Never

     ___1) Less than monthly

     ___2) Monthly

     ___3) Weekly

     ___4) Daily or almost daily

6. How often during the last three months have you needed a first drink in the morning to get yourself going after a heavy drinking session?

     ___0) Never

     ___1) Less than monthly

     ___2) Monthly

     ___3) Weekly

     ___4) Daily or almost daily

7. How often during the last three months have you had a feeling of guilt or remorse after drinking?

     ___0) Never

     ___1) Less than monthly

     ___2) Monthly

     ___3) Weekly

     ___4) Daily or almost daily

8. How often during the last three months have you been unable to remember what happened the night before because you had been drinking?

     ___0) Never

___1) Less than monthly

___2) Monthly

___3) Weekly

___4) Daily or almost daily

9. Have you or someone else been physically injured as a result of your drinking?

___ 0) No

___ 2) Yes, but NOT in the last 6 months

___ 4) Yes, during the last 6 months

10. Has a relative, friend, doctor, or other health worker been concerned about your drinking or suggested you cut down?

___ 0) No

___ 2) Yes, but NOT in the last 6 months

___ 4) Yes, during the last 6 months

**Scoring:** Each of the questions has a set of responses to choose from, and each response has a score ranging from 0 to 4. All response scores should be added and recorded as "Total". Total scores of 8 or more are recommended as indicators of hazardous and harmful alcohol use, as well as possible alcohol dependence. (A cut-off score of 10 will provide greater specificity but at the expense of sensitivity.)

Appendix I: Short Inventory of Problems-Modified for Drug Use

**Source:** Allensworth-Davies, D., Cheng, D. M., Smith, P. C., Samet, J. H., & Saitz, R. (2012).

The Short Inventory of Problems—Modified for Drug Use (SIP-DU): Validity in a Primary Care

Sample. *The American Journal on Addictions*, *21*(3), 257-262.

Instructions: For the following questions, please answer whether you have experienced any of

the following happening to you in the last 3 months.

| Never | Once or a few times | Once or twice a week | Daily or almost daily |
|-------|---------------------|----------------------|-----------------------|
| 0 | 1 | 2 | 3 |

1. I have been unhappy because of my drug use.
2. Because of my drug use, I have lost weight or not eaten properly.
3. I have failed to do what is expected of me because of my drug use.
4. When using drugs my personality has changed for the worse.
5. I have taken foolish risks when I have been using drugs.
6. While using drugs, I have said harsh or cruel things to someone.
7. When using drugs, I have done impulsive things that I regretted later.
8. I have had money problems because of my drug use.
9. My physical appearance has been harmed by my drug use.
10. My family has been hurt by my drug use.
11. A friendship or close relationship has been damaged by my drug use.
12. I have lost interest in activities and hobbies because of my drug use.
13. My drug use has gotten in the way of my growth as a person.
14. My drug use has damaged my social life, popularity, or reputation.
15. I have spent too much or lost a lot of money because of my drug use.

**Scoring:** Calculate the mean of the 15 items.

Appendix J: Flourishing Scale

Directions: Below are 8 statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement. 7 - Strongly agree, 6 – Agree, 5 - Slightly agree, 4 - Neither agree nor disagree, 3 - Slightly disagree, 2 – Disagree, 1 - Strongly disagree

1. I lead a purposeful and meaningful life

2. My social relationships are supportive and rewarding

3. I am engaged and interested in my daily activities

4. I actively contribute to the happiness and well-being of others

5. I am competent and capable in the activities that are important to me

6. I am a good person and live a good life

7. I am optimistic about my future

8. People respect me

Appendix K: Self-Rated Health from Health-Related Quality of Life

In general, would you say your health is:

Excellent

Very good

Good

Fair

Poor

Appendix L: Self-Compassion Scale – Short form

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale: Almost never - 1 2 3 4 5 – Almost always

1. When I fail at something important to me I become consumed by feelings of inadequacy.

2. I try to be understanding and patient towards those aspects of my personality I don't like.

3. When something painful happens I try to take a balanced view of the situation.

4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

5. I try to see my failings as part of the human condition.

6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

7. When something upsets me I try to keep my emotions in balance.

8. When I fail at something that's important to me, I tend to feel alone in my failure

9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

11. I'm disapproving and judgmental about my own flaws and inadequacies.

12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Appendix M: 9-item Version of the Personal Optimism and Self-Efficacy Optimism

1. For each problem I will find a solution.

2. In difficult situations I will find a way.

3. I master difficult problems.

4. I am facing my future in an optimistic way.

5. I can hardly think of something positive in the future.

6. I can master difficulties.

7. I worry about my future.

8. I always find a solution to a problem.

9. It often seems to me that everything is gloomy.


Items 4, 5, 7, and 9 reflect personal optimism.

Items 1, 2, 3, 6, and 8 reflect self-efficacy optimism.

Appendix N: Heartland Forgiveness Scale

Directions: In the course of our lives negative things may occur because of our own actions, the actions of others, or circumstances beyond our control. For some time after these events, we may have negative thoughts or feelings about ourselves, others, or the situation. Think about how you **typically** respond to such negative events. Next to each of the following items write the number (from the 7-point scale below) that best describes how you **typically** respond to the type of negative situation described. There are no right or wrong answers. Please be as open as possible in your answers.

1 (Almost always false of me)
2
3 (More often false of me)
4
5 (More often true of me)
6
7 (Almost always true of me)

1. Although I feel bad at first when I mess up, over time I can give myself some slack.

2. I hold grudges against myself for negative things I've done.

3. Learning from bad things that I've done helps me get over them.

4. It is really hard for me to accept myself once I've messed up.

5. With time I am understanding of myself for mistakes I've made.

6. I don't stop criticizing myself for negative things I've felt, thought, said, or done.

7. I continue to punish a person who has done something that I think is wrong.

8. With time I am understanding of others for the mistakes they've made.

9. I continue to be hard on others who have hurt me.

10. Although others have hurt me in the past, I have eventually been able to see them as good people.

11. If others mistreat me, I continue to think badly of them.

12. When someone disappoints me, I can eventually move past it.

13. When things go wrong for reasons that can't be controlled, I get stuck in negative thoughts about it.

14. With time I can be understanding of bad circumstances in my life.

15. If I am disappointed by uncontrollable circumstances in my life, I continue to think negatively about them.

16. I eventually make peace with bad situations in my life.

17. It's really hard for me to accept negative situations that aren't anybody's fault.

18. Eventually I let go of negative thoughts about bad circumstances that are beyond anyone's control.

Reverse score: 2, 4, 6, 7, 9, 11, 13, 15, 17

Subscales: Forgiveness of Self (1 through 6), Forgiveness of Others (7 through 12), Forgiveness of Situations (13 through 18)

Appendix O: The Coping Humor Scale

Citation: Martin, R. A., and Lefcourt, H. M. (1983). Sense of Humor as a Moderator of the

Relation Between Stressors and Moods. *Journal of Personality and Social Psychology, 45,(6)*,

1313-1324.

Please indicate the extent to which you agree or disagree with each statement.

1 (Strongly Disagree), 2 (Mildly Disagree), 3 (Mildly Agree), 4 (Strongly Agree)

1.  I often lose my sense of humor when I am having problems.

2.  I have often found that my problems have been greatly reduced when I try to find

    something funny in them.

3.  I usually look for something comical to say in tense situations.

4.  I have often felt that if I am in a situation where I have to either cry or laugh, it is better

    to laugh.

5.  I can usually find something to laugh or joke about even in trying situations.

6.  It has been my experience that humor is often a very effective way of coping with

    problems.

Note: This is originally 7 items, but 6 items were selected based on recommendations in this

article (Martin, R. A. (1996). The Situational Humor Response Questionnaire (SHRQ) and

Coping Humor Scale (CHS): A decade of research findings. *Humor, 9*, 251 – 272.)

Appendix P: Social Activation Scale

Sometimes we like to share our experiences and feelings with others more directly – telling it how it is – while other times we are more indirect or round-about in sharing our feelings with other people. The following is a list of both direct and more indirect behaviors that people sometimes use when they have problems or are upset. Please think about the times when you have been upset (sad, angry, etc.) about something related to your sexual identity/orientation. Please indicate, overall, how often you have acted in each of the following ways toward your friends and family.

0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often), 9 (N/A)

1. Gave them details about the problems
2. Asked them for help or advice about what to do about the problems
3. Asked them to share their own experiences with problems that are similar to yours
4. Asked them to love or reassurance about what you were feeling or doing
5. Asked them to do something (e.g. tell you a joke) to get your mind off the problems
6. Came across as sad but didn't state exactly why or didn't give details
7. Felt like you wanted comfort from them but didn't tell them why
8. You talked about other things or hung out just to get your mind off of your problems
9. Complained about your problems in a general way, without telling details or asking for any help
10. Whined about your problems
11. Were noticeably irritated about something or distracted when with them but didn't tell them why
12. Downplayed to them how much the problems really bothered you

Appendix Q: Self-Compassion Task

NOTE: Portions underlined only appear in the identity-specific condition

For this next task, please begin by remembering a painful or difficult situation or time period you have experienced at some point during your lifetime <u>that was related to your sexual identity</u>. Begin by recalling how you felt during this time, whether it was sadness, anger, shame, fear, etc. Now, we would like you to write a letter to yourself about you and your feelings during this time, while being neither judgmental nor dismissive of your feelings, but also without dwelling or ruminating on those negative feelings.

To start writing your own letter, try to feel that part of you that can be kind and understanding of others. Think about what you would say to a friend in your position, or what a friend would say to you in this situation. Try to have understanding for your distress (e.g., I am sad you feel distressed . . .) and recognize that these situations and emotions are experienced by many people (e.g. You are not alone). Try and be good to yourself. We would like you to write whatever comes to you, but make sure this letter provides you with what you think you need to hear in order to feel nurtured and soothed about your stressful situation or event. Please spend about 15 minutes to write the letter. There is no 'right' or 'wrong' way of doing it.

Appendix R: Forgiveness Task

Adapted from: Crowley, J. P. (2014). Expressive writing to cope with hate speech: Assessing psychobiological stress recovery and forgiveness promotion for lesbian, gay, bisexual, or queer victims of hate speech. *Human Communication Research*, *40*(2), 238-261.

NOTE: Portions underlined only appear in the identity-specific condition

 For this next task, we would like you to write about a past experience in which someone has shared a hurtful viewpoint about you (or another person with the same sexual orientation as you) because of your sexual orientation. First, you may want to acknowledge the way in which you were hurt by this experience. However, we would also like you to please write about the good things that might happen if you were to forgive this person. That is, think of any benefits that forgiving them would have, **even if you haven't or may not wish to forgive this person right now**.

 You may want to write about possible benefits to **yourself** or for the other person. Responses can include taking the perspective of your offender, putting yourself in their shoes, and empathizing with how this person might feel. Alternatively, you may also choose to think about letting go of negative feelings from the experience. **Please keep in mind, there are no right or wrong answers.** Now for the next 15 to 20 minutes, try to write about the ways that forgiveness could help you or the other person.

Appendix S: Best Possible Self (Optimism) Task

NOTE: Portions underlined only appear in the identity-specific condition

Imagine yourself in the future (6 months/1 year/2 years/5 years/10 years from now – Pick a time

frame that makes sense to you). Imagine you are in a better place in life where you and your

sexual identity are accepted, and you have resolved some of the issues <u>related to your sexual</u>

<u>identity</u> that are concerning you now or in the past.

(1) Describe where you are, what you are doing, and what is happening in your life.

Enrich with as much detail as possible.

(2) Tell yourself the crucial things you realized or the critical steps you took to get to

your better place in life. Give yourself some sage and compassionate advice from a better

future. What are the steps you need to take in order to achieve this positive future?

Appendix T: Humor Task

Adapted from Wellenzohn, S., Proyer, R. T., & Ruch, W. (2016). Humor-based online positive psychology interventions: A randomized placebo-controlled long-term trial. *The Journal of Positive Psychology*, *11*(6), 584–594. https://doi.org/10.1080/17439760.2015.1137624

NOTE: Portions underlined only appear in the identity-specific condition. Portions bolded only appear in the general condition

For this next task, please think of a time in which someone has shared a derogatory viewpoint about **your personality**/you (or another person with the same sexual orientation as you) because of your sexual orientation. This can be based off of previous experiences or can be completely imagined. For the next 15 minutes, please write about how it was (or could be) solved in a humorous way.

Appendix U: Family of Choice and Social Activation Task (Identity-Specific Condition)

Derived from Riggle, E.D.B., & Rostosky, S.S. (2012). *A positive view of LGBTQ: Embracing*

*identity and cultivating well-being*. Lanham, MD: Rowman & Littlefield.

During this next task, we will ask you to do 2 things. First, we would like you to make a

list of your **chosen** family. This can be supportive biological family members, significant others,

close friends, or others who you have adopted into your life who are <u>accepting and supportive of</u>

<u>your sexual identity</u>. What sort of positive impact have these individuals had in your life?

Sometimes we don't get the support we need because we are too shy, embarrassed, or

afraid to ask for it. We can't assume that people know what kind of support we need or what

would be helpful to us. For the next part of the task, we would like you to make a list of

supportive statements you would welcome from a member of your **chosen** family. You may also

include activities that you would enjoy doing with a member of your **chosen** family. What would

it mean to you to have this support from your loved ones?

Appendix V: Family of Choice and Social Activation Task (General Condition)

Derived from Riggle, E.D.B., & Rostosky, S.S. (2012). *A positive view of LGBTQ: Embracing*

*identity and cultivating well-being*. Lanham, MD: Rowman & Littlefield.

During this next task, we will ask you to do 2 things. First, we would like you to make a list of members of your social circle. This can be biological family members, significant others, or close friends. What sort of positive impact have these individuals had in your life?

Sometimes we don't get the support we need because we are too shy, embarrassed, or afraid to ask for it. We can't assume that people know what kind of support we need or what would be helpful to us. For the next part of the task, we would like you to make a list of supportive statements you would welcome from a member of your social circle. You may also include activities that you would enjoy doing with a member of your social circle. What would it mean to you to have this support from your social circle?

VITA

SARAH A. JOB

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|---|---|
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