THESIS

INTERSECTIONAL IDENTITY, SENSE OF LGBTQ+ COMMUNITY, SUBSTANCE USE, AND MENTAL HEALTH OUTCOMES AMONG COLLEGE STUDENTS

Submitted by

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ABSTRACT

INTERSECTIONAL IDENTITY, SENSE OF LGBTQ+ COMMUNITY, SUBSTANCE USE, AND MENTAL HEALTH OUTCOMES AMONG COLLEGE STUDENTS

Prior research has shown disparities in mental health outcomes and substance use between LGBTQ+ (lesbian, gay, bisexual, transgender, queer/questioning, and more) and non-LGBTQ+ people. Factors such as social support and LGBTQ+-specific social support have been shown to mitigate such disparities. A similar construct, sense of LGBTQ+ community has been less widely studied. In this study, LGBTQ+ (n = 154) and non-LGBTQ+ (n = 1232) undergraduate students at a large university participated in a survey. In a propensity score matched sample of LGBTQ+ students and demographically similar non-LGBTQ+ students showed no disparities in overall mood concerns, depression, anxiety, and stress; they also showed no disparities in alcohol use, cannabis use, and alcohol and cannabis co-use. Among LGBTQ+ students, sense of LGBTQ+ community was not significantly associated with mood outcomes or substance use. However, some notable disparities emerged when students were compared across racial, ethnic, gender, and sexual orientation identities simultaneously. These findings underscore the importance of an intersectional approach to research and subsequent recommendations for intervention.

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Introduction

Factors Impacting LGBTQ+ Health Disparities

Frameworks for caring for LGBTQ+ people tend to focus on deficits; for example, studies have shown that LGBTQ+ people tend to disproportionately experience a variety of negative physical and mental health outcomes such as anxiety disorders, suicidal behavior, cardiovascular disease (Conron, Mimiaga, & Landers, 2011; Russell & Fish, 2016), illicit drug use (Hatzenbuehler, Jun, Corliss, & Austin, 2015), and alcohol use (Drabble, 2000; Greenwood & Gruskin, 2007). Treatment to alleviate risk often simply offers solutions via "lifestyle changes" such as diet and exercise (Mulé et al., 2009). Such attempts to mitigate poor outcomes are not likely to be as effective as possible, because they do not directly address the persistent social and structural barriers faced by LGBTQ+ people. These include, but are not limited to, housing discrimination (Friedman et al., 2013), employment discrimination (Sears & Mallory, 2011), microaggressions (Balsam et al., 2011; Resnick & Galupo, 2019; Woodford, Chonody, Kulick, Brennan, & Renn, 2015), homelessness (Corliss, Goodenow, Nichols, & Austin, 2011) and violence (Meyer, 2010). These barriers tend to be more common and severe, and therefore more difficult to overcome, for the most marginalized people within the community, particularly LGBTQ+ people of color (Balsam, Molina, Beadnell, Simoni, & Walters, 2011; Cyrus, 2017; Meyer, 2010; Whitfield, Walls, & Langenderfer-Magruder, 2014) compared to those with more privilege.

These differential experiences within the LGBTQ+ community as a result of other identities are best explained using the framework of intersectionality. Crenshaw (1989; 1991) first described this concept in reference to the experiences of Black women in the legal system, noting that their reality was not just the sum of the experiences of racism toward Black people

and sexism toward women; there was a unique set of experiences as a result of existing at the intersection of those two marginalized identities. The term "intersectionality" is now used broadly to refer to the idea that each person caries a set of identities (i.e., sex, gender, sexual orientation, socioeconomic status, race, ethnicity, national origin, ability status, language, religion, weight, and more) that grant them privilege and/or marginalize them; these identities combine in unique ways to inform the material and psychological experiences of the individuals who hold them. Categorization by intersections of identities is not meant to rely solely on individual characteristics associated with those identities. Rather, it is acknowledged that social categories and their associated outcomes are a product of power dynamics, inequities between identities, individual characteristics, and the social environment that exists around and in response to each individual (Else-Quest & Hyde, 2016).

Given the widespread and often institutional nature of barriers for LGBTQ+ people, it makes sense that they tend to experience higher rates of mental disorder symptoms, including symptoms of mood disorders and substance use disorders, than their non-LGBTQ+ counterparts. The minority stress model was developed to explain the presence of these disparate outcomes; Meyer (1995) connected evidence that stress impacts psychological functioning with evidence that people with minority sexual identities are at higher risk for experiencing stress because of their marginalized identity. This formed the basis of the minority stress model, in which a range of prejudice-related stressors (e.g., microaggressions, violence, internalized homophobia, anticipating rejection from others, and more) are related to poorer psychological and physical health outcomes among sexual minority people (Meyer, 1995; Frost, Lehavot, & Meyer, 2015).

Research has largely supported the minority stress model for LGBTQ+ people, with a myriad of studies suggesting a relationship between LGBTQ+-specific barriers/experiences and

negative outcomes. For example, perceived discrimination may mediate the relationship between being LGBTQ+ and experiencing higher levels of depressive symptoms in some contexts (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009). Another study suggests that LGBTQ+ people experiencing consistently high or increasing rates of victimization experienced higher rates of depressive symptoms than those with less victimization (Mustanski, Andrews, & Puckett, 2016). Another study found that bullied LGBTQ+ students typically reported lower quality of life, higher rates of depressive symptoms, and more suicidal ideation than those who are not bullied (Patrick et al., 2013). LGBTQ+ people experiencing homelessness also report a variety of mental and physical health issues, with certain groups (e.g., transgender people and those identifying as "queer" or "other") experiencing higher rates of substance use and other mental health issues compared to non-LGBTQ+ homeless people (Flentje et al., 2016). Further research suggests that lesbian, gay, and bisexual adults who have experienced discrimination on the basis of multiple identities (e.g., sexual orientation, race/ethnicity, gender) appear to be at particularly high risk for developing a substance use disorder (McCabe et al., 2010). Demonstrating the interactions between discrimination, substance use, and mental health, one study suggested that substance use problems partially mediated the relationship between LGBTQ+-based victimization and suicidal ideation, often a symptom of depression (Mereish, O'Cleirigh, & Bradford, 2013). Taken together, these findings show that LGBTQ+ people are at higher risk for mental health problems and substance use, due in large part to experiences of victimization and marginalization based on LGBTQ+ identity and other intersecting identities.

Protective Factors for LGBTQ+ Individuals

Researchers have also begun to document protective factors and areas of resilience among LGBTQ+ individuals; research that moves beyond deficits and toward protective factors

is helpful in both documenting resilience and generating effective solutions for physical and mental health disparities. For example, Higa et al. (2014) found that the wellbeing of LGBTQ+ youth was positively impacted by personal empowerment, identity development, and peer support. A qualitative analysis of LGBTQ+ "It Gets Better" campaign videos suggested that leaving hostile environments in favor of supportive and affirming ones was important to developing resilience, along with forming a supportive social network and re-conceptualizing difficulties as opportunities for growth and strength (Asakura & Craig, 2013). Indeed, social support consistently emerges in the LGBTQ+ health literature as an important contributor to wellbeing and mental health. It typically includes aspects of family acceptance, peer or friend support, and community support, though these groups may vary in their amount of protectiveness for LGBTQ+ people (Moran, Chen, & Tryon, 2017; Snapp, Watson, Russell, Diaz, & Ryan, 2015).

LGBTQ+-Specific Social Support

Whereas social support from anyone in the lives of LGBTQ+ people appears to bolster their development of resilience and wellbeing, studies have also begun to investigate the impact of LGBTQ+ community-specific support and sense of connectedness. LGBTQ+-specific mentorship and peer networks have emerged as a positive factor in LGBTQ+ youth wellbeing (Higa et al., 2014). Other studies suggest that the impacts of sexual minority stress are mitigated by socialization with a larger community of people with a shared sexual identity. For example, Latinx lesbians and gay men in one study reported fewer depressive symptoms and higher levels of self esteem when actively engaged with other Latinx LGBTQ+ community members (Zea, Reisen, & Poppen, 1999).

Further research indicates that LGBTQ+ youth fare better when they have access to Gay-Straight Alliances (GSAs) at school; they report lower levels of alcohol and tobacco consumption, fewer suicide attempts, and less risky sexual behavior than youth in schools without GSAs (Poteat et al., 2012). Consistent with previous research showing that LGBTQ+ people benefit from support from non-LGBTQ+ people, Doty, Willoughby, Lindahl, and Malik (2010) found that sexual minority youth received general support (i.e., support for problems or stressors not related to their sexuality) from family members and heterosexual friends. However, these youth reported receiving the most sexual orientation-specific support from other sexual minority friends. In turn, higher levels of support around sexual orientation were associated with decreased emotional distress, acting as a buffer from sexual minority stress. Similarly, a study by Frost, Meyer, and Schwartz (2016) showed that LGBTQ+ people, particularly bisexual and gay men, tend to access support from "chosen family" within the LGBTQ+ community, defined as a group of people who are emotionally close to and supportive of one another despite no legal or biological relationship. Participants in this study also reported that everyday social support was most often provided by friends with the same sexual orientation and racial/ethnic identity as them. Findings like these demonstrate how LGBTQ+ community members are uniquely situated to help one another with stressors and concerns specific to their sexual identity. One study even suggested that, when LGBTQ+ people were receiving support from a same-sex partner, they often re-framed experiences of discrimination or minority stress as redemptive and subsequently reported feeling closer to their partner as a result (Frost, 2014). Just as victimization and discrimination appear to worsen outcomes for LGBTQ+ people, it seems that social support and related factors improve them and may even allow for helpful re-framings of discrimination.

Overall, connecting with and being supported by other LGBTQ+ peers seems to benefit LGBTQ+ people across psychological outcomes.

Psychological Measures of LGBTQ+ Community and Connection

Based on the established importance of LGBTQ+ community connection and support (Frost, Meyer, & Schwartz, 2016; Poteat et al., 2012), it is important for researchers to better understand the nature of the support given and received within the LGBTQ+ community, and the benefits that this sense of community may yield in the lives of LGBTQ+ individuals. To begin, it is important to distinguish between several similar terms in the literature. One term is "sense of community". Psychological sense of community has been studied in broader contexts, and its conceptualization has varied by study (Hill, 1996). Some theorized elements include: cohesion, membership, influence, similarity, involvement, and fulfillment of emotional needs. Yin and Israel (2012) developed a scale to facilitate research on this topic within the LGBTQ+ community specifically: the Psychological Sense of LGBT Community Scale (PSOC-LGBT), modified from an existing scale designed specifically for gay and bisexual men only. Using this scale, respondents can report the extent to which they perceive the existence of a local LGBTQ+ community. They can also indicate the extent to which they feel they belong to, and can rely on, the LGBTQ+ community. The authors of the PSOC-LGBT reported that their scale was validated with a diverse sample. Although all participants came from a specific region of the U.S.'s West Coast, they indicated that participants represented a broad range of age, political opinion, ethnic identity, type of community (e.g., rural, suburban, etc.), socioeconomic status, relationship status and more. They reported good reliability with this sample ($\alpha = 0.91$), as well as good validity, evidenced by appropriate correlations with similar scales (e.g., "Community participation" and "Satisfaction with social support received in the LGBT community"). Since its

publication, some researchers have cited this scale (Flaherty, Zwick, & Bouchey, 2014; Mannarini, Rochira, & Talò, 2014) and fewer have utilized it as a measure in their research (Murchison, Boyd, & Pachankis, 2016).

Another relevant term in the literature is connectedness to, or connection with, community. This term appears inextricable from sense of community, and the two terms are often discussed in tandem or interchangeably (e.g., Chipuer, 2001). It has been measured as the degree of support, safety, activity, and friendships that an individual perceives in their community (e.g., in their neighborhood or school). This has also been studied specifically in the context of LGBTQ+ community, using a measure called Connectedness to the LGBT Community (Frost & Meyer, 2012). This study recognized that sense of LGBTQ+ community had been explored mostly with gay and bisexual men and sought to develop a scale that measured connectedness among all members of the LGBTQ+ community with particular attention to racial and ethnic diversity. Frost and Meyer reported no mean differences among racial/ethnic or gender groups within their study but noted that bisexual participants reported lower levels of connectedness than lesbian and gay participants. They also noted that connectedness was not associated with depression, though it was associated with psychological wellbeing only among some combinations of racial/ethnic and gender identity. For example, Black women and men and Latino men reported similar levels of connectedness as other groups within the study but did not seem to have the associated increases in wellbeing that White women and men and Latinas experienced. Such results indicate the importance of better understanding sense of community and connectedness for LGBTQ+ people across intersections of identities and in relation to important psychological outcomes. Results (e.g., Frost and Meyer, 2012) show that the benefits of community connectedness may vary as a function of identity.

This is echoed by research suggesting that, although non-White LGBTQ+ people rely on people within their community as much as White LGBTQ+ people, they report receiving support in fewer domains (Frost, Meyer, & Schwartz, 2016).

Furthermore, the term "belonging" also emerges in the literature alongside discussions of community connectedness. The need to belong has long been considered a fundamental human motivation, showing positive associations with wellbeing. Belongingness or sense of belonging within a group is often conceptualized as an individual's involvement or integration with the community, including aspects of fitting in with the group and feeling valued and important (Hagerty et al., 1992).

The focus in this study will be on sense of LGBTQ+ community, though this concept has clear overlaps with some of the other relevant terms. Sense of community, and specifically sense of LGBTQ+ community is of particular importance because it may be related to important mental health outcomes for group members; for example, in one study, general sense of community and sense of lesbian community were associated with lower levels of depression among a sample of lesbians (McLaren, 2009). While some studies have examined outcomes associated with social support for LGBTQ+ people, there are no studies that have explicitly focused on relationships between sense of LGBTQ+ community and mental health. Measures of social support, such as the Significant Others Scale (SOS), require participants to call to mind specific individuals who serve as sources of support before ranking them on items related to emotional and practical support (Power et al., 1988); sense of LGBTQ+ community, on the other hand, represents a broad sense of possible support and belonging from a community as a whole. This may be informed by personal experiences within a community, reports from peers of their experiences, and/or media messages regarding the LGBTQ+ community and LGBTQ+-specific

spaces and events. Sense of LGBTQ+ community is an important construct to study because it has substantial overlap with constructs like social support and belonging, which appear to be mentally beneficial, yet remains distinct from existing research. Specifically, there are items on the PSOC-LGBT that reference social support (e.g., "How much do you feel that your needs are met by the LGBTQ+ community?" and "How much do you feel that you can get help from the LGBTQ+ community if you need it?"), suggesting that social support is a contributor to a person's sense of LGBTQ+ community. However, it is distinct from social support in that it also encompasses support given, in addition to support received (e.g., "How much do you feel that you help other LGBTQ+ people when they need help?"); it also moves beyond evaluating individuals relationships and considering a person's perceptions of a community as a whole or in general. Further, studying sense of LGBTQ+ community through an intersectionality lens may reveal important differences and similarities in how groups of people by identity experience the LGBTQ+ community.

Factors Impacting Sense of LGBTQ+ Community

From psychology and other fields, it is clear that social support and community with other LGBTQ+ people are important to identity development and mental health in general. Further research suggests that connectedness and sense of LGBTQ+ community may be unique constructs that contribute to outcomes for LGBTQ+ people. What, then, are the factors that are likely to diminish or prevent connection within the LGBTQ+ community?

First, it is widely acknowledged that geographic location is a persistent barrier to finding LGBTQ+-specific communities and social support; population estimates suggest that there are higher concentrations of LGBTQ+ people in large urban centers than in other areas (Fredriksen-Goldsen & Muraco, 2010). This study also indicates that researchers of LGBTQ+ experiences

disproportionately recruit participants from urban areas compared to rural ones, meaning that our understanding of rural LGBTQ+ community cultures are limited relative to urban communities. However, there are some studies that have investigated the experiences of LGBTQ+ people in rural areas. Results from one study show that sexual minority adolescents in rural areas were at higher risk for suicidality, substance use, and pregnancy compared to their urban counterparts, though this study did not specifically assess for the size of, or involvement in the LGBTQ+ community (Poon & Saewyc, 2009). While it is possible that connection to a sexual/gender-minority specific community protects urban youth from these reported outcomes, research has not yet elucidated this connection. Other research regarding rural LGBTQ+ people reveals that they experience less contact with the LGBTQ+ community in addition to a lower sense of connectedness to it, relative to those living in nearby cities (Power et al., 2014). Ethnographic work adds to understandings of these experiences; Gray (2009) documented about the experiences of LGBTQ+ young people in rural areas of the Unites States and wrote about reports of difficulty finding community and being accepted, as well as lack of access to LGBTQ+-specific resources.

Beyond geographical factors, other identities also appear to affect sense of LGBTQ+ community, consistent with intersectionality theory. Aligned with this concept, research has shown that, within the LGBTQ+ community, individual experiences are informed by other identities as well. Sense of community may, on average, differ among groups/identities, and intersections of identities. Although this finding was largely not supported by Frost and Meyer (2012), their results did suggest that community connectedness may produce different outcomes by identity within the community. It is therefore important to consider the ways that racism, sexism, cissexism, classism, ableism, and other forms of bias serve either to disconnect certain

groups from the broader LGBTQ+ community or to prevent those groups from accessing the psychosocial benefits that come with connectedness and sense of community.

For example, race and ethnicity are a factor in inclusion and power within the community. In one study, interviews were conducted with LGBTQ+ people of color in Canada; participants described their local LGBTQ+ community as predominantly White and reported difficulty accessing social support and feeling a sense of belonging within the community (Giwa & Greensmith, 2012). Respondents also noted the high value placed on Anglocentric beauty standards that give White LGBTQ+ community members higher social standing. Han (2007) confirms the persistence of both overt and covert forms of exclusion from White gay men toward gay men of color, reporting that White LGBTQ+ community members tend to exclude people of color from leadership positions, ignore their calls for discussions of racism within the community, and sidestep other important discussions that they perceive as unrelated to being LGBTQ+ (e.g., homelessness, immigration rights). Han adds that media portrayals of LGBTQ+ lives predominantly show wealthy White people and only depict people of color in harmfully stereotypical ways. Similarly, socioeconomic status and race are both factors that impact access to LGBTQ+-specific resources, with Black, Latinx, and low-income residents in a large U.S. city living in an "LGBTQ service desert" (Rosentel, VandeVusse, & Hill, 2019).

Specific sexual and gender identities within the LGBTQ+ umbrella also inform experiences within the community. Frost and Meyer (2012) found that bisexual respondents to their LGBTQ+ community connectedness scale reported feeling less connected than lesbians and gay men, for example. Other research shows similar trends, with bisexual people reporting both discrimination from non-LGBTQ+ people as well as exclusion from within the LGBTQ+ community where they are often regarded as "not gay enough" (Barker, 2004; Esterberg, 2011;

Martin & Pallotta-Chiarolli, 2009). A study with plurisexual (e.g., bisexual, pansexual) women during and after pregnancy indicated varying levels of desire for LGBTQ+ community, as well as perceptions of barriers to accessing such community (Manley, Goldberg, & Ross, 2018). Barriers included internalized stigma as well as perception of rejection from the LGBTQ+ community. Although research has not made a direct connection between these reports of bisexual and pansexual exclusion and mental health, it is worth noting that bisexual people do tend to report poorer mental health and substance use outcomes than their monosexual (e.g., gay, lesbian, heterosexual) counterparts (Jorm et al., 2002; Marshal et al., 2008; Page, 2004; Ross et al., 2017). One study suggested a quadratic relationship between sexual orientation and substance use, such that people who considered themselves exclusively heterosexual or homosexual had lower outcomes relative to plurisexual (e.g., bisexual, pansexual) people (Parnes, Rahm-Knigge, & Conner, 2016). People who are on the spectrum of asexuality may also experience exclusion from the broader LGBTQ+ community, though research on this topic is scarce (Carrigan, Gupta, & Morrison, 2013).

Transgender people also report exclusion from the larger LGBTQ+ community; some LGBTQ+ community members even argue that the community should focus on sexual minority identity and that transgender people belong in a separate category (Stone, 2009). Some predominantly queer spaces exclude transgender people on the basis of bodies and lived experience; for example, transgender women are excluded from an all-women's music festival in the U.S. under the guise of emphasizing the importance for women to have a space to be around other women who were born, raised, and acknowledged by others as women throughout their lives (Browne, 2011). Transgender people, particularly women, are often not considered as potential dating partners, both by people in and out of the LGBTQ+ community (Blair & Hoskin,

2019). Others argue for separating non-binary and gender non-conforming individuals from the transgender umbrella (Davidson, 2007). These dynamics within the LGBTQ+ community are likely to prevent many transgender people, and especially non-binary and gender non-conforming people, from perceiving a strong sense of connection in the broader community.

Importantly, intersectionality posits that any and all identities described here can exist in one person simultaneously and interact to create multiplicative, not just additive, experiences of marginalization (Bowleg, 2008; Hancock, 2008). For example, someone who is Black, transgender, and currently residing in a rural area is likely to experience all the barriers common to each of those identities, in addition to the unique experiences of marginalization associated with living at that particular intersection – all of which are likely to impact connectedness within the LGBTQ+ community.

Overall, the studies presented here support the notion that sense of LGBTQ+ community is important to the wellbeing of LGBTQ+ people, with possible impacts on depression, anxiety, substance use, and more; they also show that identity, location, and access are related to the extent to which a person feels like they belong within the community. Some findings suggest that, even when such factors do not seem to differentially affect amount of connection, they may have an effect on the psychological outcomes of sense of community.

Implications for Counseling Practice

Research has shown a clear connection between social support, especially within-community support, and mental health outcomes for LGBTQ+ people. Better understanding the relationships between identity, sense of community, and mental health outcomes can help clinicians best serve the needs of their LGBTQ+ clients, informed by an intersectional and relational-cultural understanding of mental health.

Relational-cultural theory (RCT) is a set of perspectives about healing and psychological development that translate into recommendations for clinical practice in the form of relational-cultural therapy (Jordan, 2001; Jordan, 2010). This theory contrasts with mainstream, traditional theories and counseling orientations that centralize the importance of self-sufficiency and independence from others as measures of mature functioning. Instead, RCT posits that humans are wired to be in connection with other people and that growth and healing take place in the context of mutually empathic relationships. The focus of relational cultural therapy is therefore to support clients in removing barriers to these authentic, healing connections. RCT conceptualizes barriers to connection as both individual and systemic; on a societal level, marginalized groups are silenced by privileged groups. Because of forces like bias and discrimination, for example, it may feel safer to disconnect or deny parts of oneself than to enter relationships authentically.

This model for understanding mental health issues and psychological wellbeing has a clear connection to LGBTQ+ experiences. RCT postulates that empathy and connectedness in relationships promote healing and growth; for LGBTQ+ people, who are often disconnected from and marginalized by the non-LGBTQ+ community, it would make sense that seeking connection within their community would be associated with positive mental and emotional outcomes. The RCT conceptualization of mutually empathic connections can be applied on an individual level or among community, with both acknowledged as opportunities for healing and growth.

Heterosexism, heteronormativity, and transphobia are not the only forms of bias impacting LGBTQ+ individuals; racism, sexism, and more also impact multiply marginalized community members. This combination of factors may lead to lower levels of LGBTQ+

community connectedness or less fulfillment as a result of the connections they do have. Studying the factors related to connectedness and the subsequent outcomes is important to developing culturally competent and intersectionality-informed counseling recommendations.

The Present Study

Currently, research has yet to fully elucidate the connections between sense of LGBTQ+ community and mental health correlates such as depression, anxiety, and substance use among LGBTQ+ people. It is clear that mental health and substance use disparities exist, putting LGBTQ+ people at higher risk, and that these risks may be attenuated by social support, particularly from within the LGBTQ+ community. However, sense of LGBTQ+ community is understudied as a possible factor impacting psychological and substance use outcomes. Although research is also clear that intersecting marginalized identities put many LGBTQ+ people at higher risk for poor outcomes, it is also unclear from current research how intersectionality impacts sense of LGBTQ+ community.

The present study seeks to understand whether sense of LGBTQ+ community is associated with better mental health outcomes, including mood and substance use, for LGBTQ+ people. Acknowledging differences in experience informed by intersecting identities, the present study seeks to understand whether perceived sense of LGBTQ+ community varies by sexual orientation and gender identity as well as other identities such as race and ethnicity. Following Frost and Meyer (2012), this study also seeks to investigate how the relationship between sense of community and mental health outcomes may vary by identity, including sexual orientation, gender identity, and race/ethnicity.

Consistent with previous literature, I hypothesized that non-LGBTQ+ participants would report more favorable outcomes, including lower levels of depressive symptoms, anxious

symptoms, stress, and substance use compared to LGBTQ+ participants (Hypothesis 1). I hypothesized that sense of LGBTQ+ community would predict mood and substance outcomes among LGBTQ+ people; I hypothesized that higher levels of community would be associated with more favorable mental health outcomes (i.e., lower depressive, anxious, and stress symptoms; less substance use; Hypothesis 2). I also hypothesized that some groups, by intersections of race/ethnicity and specific LGBTQ+ identities, would have higher mean levels of sense of community than others (Hypothesis 3). For example, I expected that people with more privileged identities, both within and beyond LGBTQ+ identities, would experience a stronger sense of LGBTQ+ community. I expected that LGBTQ+ people of color, transgender people (particularly non-binary people) and bisexual people (along with other "plurisexual" – indicating attraction to multiple genders – identities such as pansexual) would report lower levels of community and poorer mental health outcomes than other groups. Consistent with theories of intersectionality, I predicted that people with two or more of these identities (e.g., Black, non-binary bisexuals; Asian, asexual women) would experience the lowest levels of sense of LGBTQ+ community.

Methods

Participants

Data come from a sample of students who are mostly young adults at a large public university in the United States. After removing participants who did not complete the survey, the broader sample contained 1,401 participants. Of these, 169 identified as part of the LGBTQ+ community. Demographic information about this sample is reported in Table 1. A power analysis was conducted using G*Power (Faul et al., 2007; 2009) for a linear multiple regression model with a fixed slope assuming $\alpha = .05$ and $\beta = .80$ and a small to moderate effect size $f^2 = .06$, the *a priori* sample size needed was $n = 97$. Thus, the current sample was adequately powered to detect even small to moderate effects for Hypothesis 2. Hypothesis 1 used propensity score matching, described below, to double the sample size available for Hypothesis 2. Further, Hypothesis 3, which focuses on intersectional identities, has some small group sizes; however, the emphasis is on the magnitude and direction of the effects rather than on null hypothesis significance testing, making statistical power not relevant in a traditional sense.

Procedure

Data were acquired using an online survey administered with Qualtrics software. Participants were undergraduate students recruited from introductory psychology courses at a large U.S. university. Students received class credit for participating. These procedures were approved by the institutional review board at Colorado State University.

Measures

A copy of all measures used in this study are provided in Appendix A. Participants were asked to provide the following demographic information: date of birth

Table 1. Demographic characteristics of the LGBTQ+ sample.

		Count
Race	American Indian or Alaska Native	1
	American Indian/Alaska Native, White, and another race	1
	American Indian/Alaska Native and White	1
	Asian	10
	Asian, Black/African American, and White	2
	Asian and Native Hawaiian/Other Pacific Islander	1
	Asian and White	2
	Black or African American	8
	Black/African American and White	3
	White	133
	Another race	3
	Do not wish to respond	5
Ethnicity	Hispanic or Latinx	32
	Not Hispanic or Latinx	123
	Other	9
	Prefer not to disclose	7
Gender	Agender	1
	Androgynous	1
	Cis man	25
	Cis man and man	1
	Trans man and transgender	1
	Man	5
	Cis woman	81
	Cis woman and woman	11
	Cis woman, woman, gender non-conforming	1
	Cis woman, genderqueer	1
	Trans woman and woman	1
	Woman	27
	Demi-girl	1
	Gender fluid	3
	Non-binary	4
	Genderless	1
	Man, woman, and Two Spirit	1
	Cis woman	42

	Other	1
	Prefer not to disclose	4
Sexual Orientation	Asexual/gray-asexual	2
	Bisexual	93
	Bisexual/pansexual	1
	Bisexual/queer	1
	Demipansexual	1
	Demisexual	1
	Gay	19
	Heterosexual	1
	Homoflexible	1
	Homsexual	3
	Lesbian	16
	Mostly heterosexual	1
	Mostly homosexual	1
	Pansexual	16
	Queer	2
	Queer/pansexual	1
	Straight	4
	Other	2

(i.e., to ascertain age), race, ethnicity, gender identity, and whether they identify as part of the LGBTQ+ community. Participants were also asked to provide information on their sexual orientation/preference in multiple formats; the one used for the purpose of this study was a write-in option. Decisions on categorization by identity can be found in Appendix B. For the purpose of this study, each LGBTQ+ participant was categorized by four identities: race (i.e., non-White or White), ethnicity (i.e., Hispanic/Latinx or non-Hispanic/Latinx), gender identity (i.e., gender minority, cisgender woman, or cisgender man), and sexual orientation (i.e., lesbian, gay, bisexual/pansexual, or other).

Perceived sense of LGBTQ+ community was assessed using the Psychological Sense of LGBT Community Scale (PSOC-LGBT; Lin & Israel, 2012). This scale assessed perceptions of the existence of a local LGBTQ+ community, feelings of belonging to the LGBTQ+ community,

and perceptions of dependability of their local LGBTQ+ community. Participants responded to 17 items, such as “How much do you feel your opinion matters to other LGBT people?” and “How often do you feel like you belong in the LGBT community?”. Items were rated on a Likert scale ranging from 1 = “none” and 5 = “a great deal”. Higher overall scores indicated higher levels of sense of community and ability to depend on the broader LGBTQ+ community. This data showed high reliability ($\alpha = 0.90$). Across LGBTQ+-identified participants, the mean score on this scale was 41.3 with a standard deviation of 5.3.

Mood-related symptoms and concerns were assessed using a shortened, 21-item version of the Depression Anxiety and Stress Scales (DASS-21). Participants were asked to consider how much each statement applied to them over the past week. They responded to items such as “I couldn’t seem to experience any positive feeling at all” and “I found it difficult to relax”. Items were rated on a scale ranging from 1 = “did not apply to me at all” to 4 = “applied to me very much, or most of the time”. Seven of the items comprise the “Depression” scale, seven comprise the “Anxiety” scale, and the remaining seven comprise the “Stress” scale. On each scale, as well as on the overall measure, higher scores indicate higher severity of mood-related symptoms. Among participants who did *not* consider themselves to be part of the LGBTQ+ community, this scale was found to be highly reliable ($\alpha = 0.94$). The mean among this group was 34.9 with a standard deviation of 9.0. Among participants who *did* consider themselves to be part of the LGBTQ+ community, this scale was found to be highly reliable ($\alpha = 0.94$). The mean among this group was 41.4 with a standard deviation of 11.4

Personal substance use was assessed using a series of questions about typical alcohol use, cannabis use, and alcohol and cannabis co-use questions. First participants were presented with information about what constitutes a standard drink of alcohol. They were then asked to provide

an estimate of how many standard drinks they consumed each day during a typical week in the last 30 days. Similarly, participants were asked to estimate on which days they consumed cannabis during a typical week in the last 30 days. Finally, they were asked to estimate on which days they consumed both alcohol and cannabis during a typical week in the last 30 days.

Substance use and co-use measures violated the normality assumption. Therefore, median values and range are reported for each. This is consistent with the plan to use negative binomial regression, which is appropriate for highly skewed count variables (Neal & Simons, 2007). Table 2 shows median number and range of the following variables, for LGBTQ+ and non-LGBTQ+ people: number of standard drinks during an average week, number of days of cannabis use during an average week, and number of days of alcohol and cannabis co-use during an average week.

Table 2. Median and range of substance use outcomes among students by LGBTQ+ community membership.

	LGBTQ+		Non-LGBTQ+	
	Median	Range	Median	Range
Number of standard drinks per week	2	0 to 46	4	0 to 74
Days of cannabis use per week	1	0 to 7	0	0 to 7
Days of co-use per week	0	0 to 7	0	0 to 7

Analysis Plan

In lieu of a traditional analysis plan, descriptions and justifications of all analyses conducted are written alongside results below.

Results

Demographic data was first divided into four broad categories for gender, race, ethnicity, and sexual orientation. Decisions on categorization can be found in Appendix B. Of 48 possible combinations, 24 groups were represented with at least one participant, representing 50% of possible combinations. Only six groups had eight or more participants, which is an arbitrary data-driven cutoff used to provide the reader with an overview of the data. The following combinations, or intersections, of identity were present in the LGBTQ+ sample: White, non-Hispanic cisgender lesbian/gay woman (n = 10); non-White, non-Hispanic cisgender lesbian woman (n = 2); White, Hispanic cisgender lesbian woman (n = 4); White, non-Hispanic cisgender gay man (n = 8); White, Hispanic cisgender gay man (n = 1); non-White, Hispanic cisgender gay man (n = 1); White, non-Hispanic gay gender minority (n = 1), non-White, non-Hispanic gay gender minority (n = 1), White, non-Hispanic bisexual or pansexual cis man (n = 9), non-White, non-Hispanic bisexual or pansexual cis man (n = 1), White, Hispanic bisexual or pansexual cis man (n = 1), non-White, Hispanic bisexual or pansexual cis man (n = 1), White, non-Hispanic bisexual or pansexual cis woman (n = 54), non-White, non-Hispanic bisexual or pansexual cis woman (n = 11), White, Hispanic bisexual or pansexual cis woman (n = 8), non-White, Hispanic bisexual or pansexual cis woman (n = 3), White, non-Hispanic bisexual or pansexual gender minority (n = 4), non-White, non-Hispanic bisexual or pansexual gender minority (n = 1), White, Hispanic bisexual or pansexual gender minority (n = 2), non-White, non-Hispanic cis man with another sexual orientation (n = 1), White, Hispanic cis man with another sexual orientation (n = 2), White, non-Hispanic cis woman with another sexual orientation (n = 4), non-White, non-Hispanic cis woman with another sexual orientation (n = 1),

White, Hispanic cis woman with another sexual orientation (n = 1), White, non-Hispanic gender minority with another sexual orientation (n = 2).

Mean mental health and substance use outcomes were calculated for one category of identity at a time. For example, Table 3 depicts mean outcomes (and standard deviations) among White and non-White LGBTQ+ participants. Table 4 depicts outcomes among Hispanic/Latinx and non-Hispanic/Latinx participants. Table 5 depicts outcomes among gay, lesbian, bisexual/pansexual participants, and participants with other sexual orientations. Table 6 depicts outcomes among cisgender men, cisgender women, and gender minority participants. Cohen's *d* was calculated to assess differences in mean and standard deviation between groups, with the following cutoffs (Cohen, 1988): 0.2 (small); 0.5 (moderate); 0.8 (large). Table 7 shows Cohen's *d* values and confidence intervals, with non-trivial results reported below.

When comparing White and non-White students, the following non-trivial (i.e., Cohen's d ≥ |.2|) differences were noted. The differences in anxiety (*d* = 0.22; CI [-0.24, 0.69]) and stress (*d* = 0.34; CI [-0.12, 0.81]) were small to moderate, with non-White students showing more favorable (i.e., lower scores) outcomes compared to White students. There was a small to moderate difference in alcohol use (*d* = 0.35; CI [-0.12, 0.81]), with non-White students consuming less alcohol compared to White students. There was also a small to moderate difference in co-use (*d* = -0.40; CI [-0.86, 0.07]), with White students endorsing less weekly co-use compared to non-White students.

When comparing Hispanic/Latinx and non-Hispanic/Latinx students, the following non-trivial differences were noted. The differences in overall mood (*d* = 0.48; CI [0.03, 0.93]), depression (d = 0.46; CI [0.01, 0.91]), and anxiety (d = 0.25; CI [-0.20, 0.70]) were small to moderate, with non-Hispanic/Latinx students showing more favorable (i.e., lower scores)

outcomes compared to Hispanic/Latinx students. The difference in stress (*d* = 0.54; CI [0.09, 1.00]) was moderate to large, with non-Hispanic/Latinx students showing more favorable (i.e., lower scores) outcomes compared to Hispanic/Latinx students. There was a small to moderate difference in co-use (*d* = -0.23; CI [-0.68, 0.22]), with non-Hispanic/Latinx students showing lower levels of use compared to Hispanic/Latinx students. Furthermore, there was a small to moderate difference in sense of LGBTQ+ community (*d* = -0.22; CI [-0.67, 0.23]), with Hispanic/Latinx students reporting higher levels of sense of community.

Because sexual orientation was not a dichotomous variable, comparisons were made between two categories at a time. Between lesbian and gay students, the following non-trivial differences were noted: small to moderate differences in overall mood (*d* = 0.31; CI [-0.53, 1.14]) and depression (d = 0.26; CI), such that gay (i.e., gay men) students had more favorable (i.e., lower scores) outcomes than lesbian students; a moderate to large difference in anxiety (*d* = 0.57; CI [-0.27, 1.42]), with gay students showing more favorable outcomes than lesbian students; a small to moderate difference in alcohol use (*d* = 0.29; CI [-0.54, 1.13]), such that gay students had lower levels of alcohol than lesbian students; a large difference in sense of LGBTQ+ community (d = -0.86; CI [-1.72, 0.01]), such that gay students reported a higher sense of community than lesbian students.

Between lesbian and bisexual/pansexual students, the following non-trivial differences were noted: small to moderate difference in anxiety (*d* = 0.39; CI [-0.20, 0.98]), such that bi/pan students showed more favorable (i.e., lower scores) outcomes than lesbian students; a small to moderate difference in stress (*d* = -0.30; CI [-0.89, 0.29]), such that lesbian students showed more favorable outcomes than bi/pan students; a small to moderate differences in alcohol (*d* = -0.23; CI [-0.82, 0.36]) and cannabis use (*d* = -0.47; CI [-1.06, 0.13]), such that lesbian students

had lower levels of alcohol and cannabis use compared to bi/pan students; a small to moderate difference in sense of LGBTQ+ community (d = -0.31; CI [-0.90, 0.28]), such that bi/pan students had higher sense of community than lesbian students.[1]

Between gay and bisexual/pansexual students, the following non-trivial differences were noted: small to moderate differences in overall mood (*d* = -0.24; CI [-0.85, 0.37]), anxiety (*d* = -0.20; CI [-0.81, 0.41]), and stress (*d* = -0.25; CI [-0.86, 0.36]), with gay students reporting more favorable (i.e., lower scores) outcomes compared to bi/pan students; small to moderate differences in alcohol use (*d* = -0.39; CI [-1.00, 0.22]) and cannabis use (*d* = -0.36; CI [-0.97, 0.25]), with gay students using less alcohol and cannabis in an average week compared to bi/pan students; a moderate to large difference in sense of LGBTQ+ community (*d* = 0.66; CI [0.05, 1.28]) with gay students reporting a higher sense of community than bi/pan students.

Because gender was also not a dichotomous variable, comparisons were made between two categories at a time. Between cisgender men and cisgender women, the following non-trivial differences were noted: small to moderate differences in overall mood (*d* = -0.41; CI [-0.87, 0.04]), depression (*d* = -0.41; CI [-0.87, 0.04]), anxiety (*d* = -0.33; CI [-0.79, 0.12]), and stress (*d* = -0.32; CI [-0.77, 0.14]), with cis men showing more favorable outcomes compared to cis women; a small to moderate difference in sense of LGBTQ+ community (*d* = 0.45; CI [-0.01, 0.90]), with cis women reporting a higher sense of community than cis men.

Between cisgender men and gender minority students, the following non-trivial differences were noted: small to moderate differences in overall mood (*d* = -0.41; CI [-1.14, 0.31]) and stress (*d* = -0.37; CI [-1.09, 0.36]), such that cis men had more favorable (i.e., lower scores) outcomes compared to gender minority students; a moderate to large difference in

[1] LGBTQ+ students in the "other" category of sexual orientation were not interpreted here because they did not represent a meaningful category of shared experience (i.e., because this category was comprised of students with a variety of sexual orientation identities).

depression (d = -0.61; CI [-1.34, 0.13]), such that cis men had more favorable outcomes than gender minority students; a large difference in alcohol use (d = 0.82; CI [0.08, 1.57]), with gender minority students reporting lower levels of weekly use compared to cis men; a moderate to large difference in sense of LGBTQ+ community (d = 0.74; CI [0.00, 1.48]), such that gender minority students reported a higher sense of community than cis men.

Between cisgender women and gender minority students, the following non-trivial differences were noted: a small to moderate difference in anxiety (d = 0.25; CI [-.036, 0.86]), such that gender minority students reported more favorable (i.e., lower scores) outcomes compared to cis women; a moderate to large difference in alcohol use (d = 0.58; CI [-0.03, 1.19]), with gender minority students reporting less use than cis women; a small to moderate difference in cannabis use (d = -0.23; CI [-0.84, 0.38]), with cis women reporting less use than gender minority students.

Table 3. Outcomes among LGBTQ+ White and non-White students.

Variable	Mean Score (SD)	
	White	Non-White
Depression	13.6 (4.7)	14.2 (5.3)
Anxiety	12.7 (4.3)	12.2 (3.6)
Stress	14.9 (4.1)	13.8 (3.8)
Overall Mood	41.2 (11.8)	40.2 (10.8)
Alcohol Use	5.8 (7.9)	3.2 (4.8)
Cannabis Use	2.5 (2.8)	2.3 (2.7)
Co-Use	0.8 (1.2)	1.2 (1.8)
Sense of LGBTQ+ Community	41.1 (5.0)	41.1 (5.8)

Table 4. Outcomes among LGBTQ+ Hispanic/Latinx and non-Hispanic/Latinx students.

Variable	Mean Score (SD)	
	Hispanic/Latinx	Non-Hispanic/Latinx
Depression	11.8 (4.2)	14.1 (4.9)
Anxiety	11.7 (3.6)	12.9 (4.3)
Stress	12.8 (3.7)	15.1 (4.1)
Overall Mood	36.3 (9.2)	42.1 (11.8)
Alcohol Use	4.3 (4.9)	5.6 (8.0)
Cannabis Use	2.5 (2.6)	2.5 (2.8)
Co-Use	1.0 (1.3)	0.7 (1.3)
Sense of LGBTQ+ Community	42.0 (3.1)	40.9 (5.5)

Table 5. Outcomes among LGBTQ+ students who were lesbian, gay, bisexual/pansexual, or another sexual orientation.

Variable	Mean Score (SD)			
	Lesbian	Gay	Bi/Pan	Other
Depression	14.1 (6.2)	12.8 (2.3)	13.7 (5.0)	13.7 (4.3)
Anxiety	14.0 (4.8)	11.6 (3.5)	12.5 (4.1)	13.7 (4.7)
Stress	13.5 (4.5)	13.8 (3.3)	14.8 (5.1)	16.3 (3.8)
Overall Mood	41.6 (14.5)	38.2 (6.1)	41.0 (11.8)	101.0 (11.2)
Alcohol Use	4.0 (5.3)	2.8 (2.8)	5.8 (8.2)	6.5 (7.5)
Cannabis Use	1.5 (2.8)	1.8 (2.6)	2.8 (2.8)	1.1 (1.9)
Co-Use	0.9 (1.5)	0.7 (1.1)	0.8 (1.3)	0.5 (1.0)
Sense of LGBTQ+ Community	39.7 (6.0)	43.9 (3.2)	41.1 (4.3)	41.2 (7.5)

Table 6. Outcomes among LGBTQ+ cisgender men, cisgender women, and gender minority students.

Variable	Mean Score (SD)		
	Cis Men	Cis Women	Gender Minorities
Depression	12.4 (3.2)	14.0 (5.2)	14.7 (5.1)
Anxiety	12.0 (3.9)	13.0 (4.4)	12.4 (3.3)
Stress	13.8 (4.1)	14.9 (4.2)	15.4 (3.8)
Overall Mood	38.3 (14.4)	41.9 (12.2)	42.4 (11.5)
Alcohol Use	5.3 (5.8)	5.9 (8.3)	1.3 (1.6)
Cannabis Use	2.5 (2.8)	2.4 (2.8)	3.0 (2.8)
Co-Use	0.8 (1.7)	0.8 (1.3)	0.6 (0.8)
Sense of LGBTQ+ Community	43.0 (4.0)	40.8 (5.1)	39.3 (6.7)

Table 7. Cohen's *d* values and corresponding 95% confidence intervals for comparisons of mental health and substance use outcomes and sense of LGBTQ+ community by a single identity at a time.

Identities Compared	Outcome	Cohen's *d*	Confidence Interval
White and Non-White	Overall Mood	0.183	-0.280, 0.647
	Depression	-0.047	-0.510, 0.416
	Anxiety	0.224	-0.240, 0.688
	Stress	0.343	-0.121, 0.808
	Alcohol Use	0.345	-0.119, 0.810
	Cannabis Use	0.078	-0.385, 0.541
	Co-Use	-0.398	-0.863, 0.068
	Sense of LGBTQ+ Community	-0.003	-0.466, 0.460
Hispanic/Latinx and Non-Hispanic/ Latinx	Overall Mood	0.477	0.026, 0.928
	Depression	0.462	0.011, 0.913
	Anxiety	0.248	-0.201, 0.696
	Stress	0.543	0.091, 0.996
	Alcohol Use	0.177	-0.271, 0.625
	Cannabis Use	-0.002	-0.449, 0.445
	Co-Use	-0.228	-0.676, 0.221
	Sense of LGBTQ+ Community	-0.221	-0.669, 0.227
Lesbian & Gay	Overall Mood	0.306	-0.527, 1.139
	Depression	0.263	-0.569, 1.095
	Anxiety	0.572	-0.273, 1.417
	Stress	-0.053	-0.882, 0.775
	Alcohol Use	0.294	-0.539, 1.126
	Cannabis Use	-0.109	-0.938, 0.720

	Co-Use	0.195	-0.635, 1.026
	Sense of LGBTQ+ Community	-0.859	-1.725, 0.006
Gay & Bisexual/Pansexual	Overall Mood	-0.239	-0.848, 0.370
	Depression	-0.177	-0.786, 0.432
	Anxiety	-0.201	-0.810, 0.408
	Stress	-0.253	-0.862, 0.356
	Alcohol Use	-0.391	-1.002, 0.220
	Cannabis Use	-0.363	-0.973, 0.247
	Co-Use	-0.130	-0.739, 0.478
	Sense of LGBTQ+ Community	0.661	0.046, 1.276
Lesbian & Bisexual/Pansexual	Overall Mood	0.066	-0.521, 0.653
	Depression	0.081	-0.507, 0.668
	Anxiety	0.389	-0.200, 0.979
	Stress	-0.297	-0.885, 0.292
	Alcohol Use	-0.228	-0.816, 0.360
	Cannabis Use	-0.465	-1.056, 0.125
	Co-Use	0.062	-0.525, 0.649
	Sense of LGBTQ+ Community	-0.309	-0.898, 0.280
Cisgender Men & Cisgender Women	Overall Mood	-0.411	-0.867, 0.045
	Depression	-0.413	-0.870, 0.043
	Anxiety	-0.334	-0.789, 0.121
	Stress	-0.319	-0.774, 0.135
	Alcohol Use	-0.070	-0.523, 0.383
	Cannabis Use	0.064	-0.389, 0.518
	Co-Use	0.011	-0.442, 0.463
	Sense of LGBTQ+ Community	0.448	-0.009, 0.905
Cisgender Men & Gender Minorities	Overall Mood	-0.415	-1.141, 0.310
	Depression	-0.608	-1.341, 0.125
	Anxiety	-0.093	-0.812, 0.626
	Stress	-0.365	-1.089, 0.359
	Alcohol Use	0.824	0.079, 1.569
	Cannabis Use	-0.164	-0.883, 0.556
	Co-Use	0.174	-0.546, 0.894
	Sense of LGBTQ+ Community	0.743	0.003, 1.483
Cisgender Women & Gender Minorities	Overall Mood	0.049	-0.559, 0.657
	Depression	-0.065	-0.673, 0.543
	Anxiety	0.252	-0.357, 0.861
	Stress	-0.036	-0.644, 0.572
	Alcohol Use	0.582	-0.032, 1.195
	Cannabis Use	-0.229	-0.837, 0.380
	Co-Use	0.193	-0.415, 0.802

	Sense of LGBTQ+ Community	0.298	-0.311, 0.907

Hypothesis 1

Propensity score matching. To create a comparable sample of LGBTQ+ and non-LGBTQ+ participants, propensity score matching was conducted using a k-nearest neighbors algorithm (Ho et al., 2011). Participants from the non-LGBTQ+ sample were matched to LGBTQ+ community members on the basis of race, ethnicity, and age. This yielded a sample of 308 participants, consisting of 154 LGBTQ+ and 154 non-LGBTQ+ participants.

Linear regression analyses. A series of linear regression models were conducted using the propensity score matched sample, regressing mental health variables on LGBTQ+ community identity. Regression models for depression, anxiety, stress, and overall mood were non-significant, controlling for age and ethnicity. Effect sizes were not substantial ($\beta < .1$). Together, these results suggest that mean values for each variable were not significantly different between LGBTQ+ and non-LGBTQ+ people in the matched sample. Mean scores on measures of depression, anxiety, stress, and overall mood measures, for LGBTQ+ and non-LGBTQ+ participants in the matched sample are reported in Table 2.

Linear regressions conducted using the entire LGBTQ+ sample ($n = 154$) and the entire non-LGBTQ+ sample ($n = 1232$; i.e., the non-matched sample) yielded significant results for models regressing depression ($\beta = .163$, $p < .001$), anxiety ($\beta = .195$, $p < .001$), stress ($\beta = .217$, $p < .001$), and overall mood ($\beta = .212$, $p < .001$) on LGBTQ+ identity, controlling for age and ethnicity.

Negative binomial regression analyses. A series of negative binomial regression models were conducted using the propensity score matched sample, regressing substance use

variables on LGBTQ+ community identity. Regression models for alcohol use, cannabis use, and alcohol and cannabis co-use were not significant, controlling for age and ethnicity, suggesting that there were no significant differences in alcohol and cannabis use and co-use between LGBTQ+ and non-LGBTQ+ people.

Rate ratios were calculated for each negative binomial regression model, with LGBTQ+ identity as a predictor. The rate ratio for the alcohol use model was 1.127, suggesting a 13% difference in alcohol use between LGBTQ+ and non-LGBTQ+ participants in the matched sample; LGBTQ+ participants reported more alcohol use on average than non-LGBTQ+ participants. The rate ratio for the cannabis use model was 1.084, suggesting an 8% difference in cannabis use between LGBTQ+ and non-LGBTQ+ participants in the matched sample; non-LGBTQ+ participants reported more cannabis use on average than LGBTQ+ participants. The rate ratio for the alcohol and cannabis co-use model was 1.085, suggesting a 9% difference in co-use between LGBTQ+ and non-LGBTQ+ participants in the matched sample; LGBTQ+ participants reported more co-use on average than non-LGBTQ+ participants.

Negative binomial models were also conducted using the full, non-matched sample, including the entire LGBTQ+ sample (n = 154) and the entire non-LGBTQ+ sample (n = 1232). As before, substance use variables were individually regressed on LGBTQ+ identity, controlling for age and ethnicity. LGBTQ+ identity was not a significant predictor of alcohol use in the full sample. The rate ratio was 1.137, suggesting a 14% difference in alcohol use between LGBTQ+ and non-LGBTQ+ participants in the full sample; non-LGBTQ+ participants reported more alcohol use on average than LGBTQ+ participants. Ethnicity was a significant predictor of alcohol use ($p < .001$); the rate ratio was 1.408, suggesting a 41% difference in alcohol use between Hispanic/Latinx and non-Hispanic/Latinx participants in the full sample; non-

Hispanic/Latinx participants reported more alcohol use on average than Hispanic/Latinx participants. LGBTQ+ identity was a significant predictor of cannabis use ($p < .05$); the rate ratio was 1.409, suggesting a 41% difference in cannabis use between LGBTQ+ and non-LGBTQ+ participants in the full sample; LGBTQ+ participants reported more cannabis use on average than non-LGBTQ+ participants. Age was also a significant predictor of cannabis use ($p < .05$); the rate ratio was 1.079. This indicates that older students reported more cannabis use, with each year older being associated with 8% more cannabis use. LGBTQ+ identity was not a significant predictor of alcohol and cannabis co-use. The rate ratio was 1.240, suggesting a 24% difference in co-use between LGBTQ+ and non-LGBTQ+ participants in the full sample; LGBTQ+ participants reported more co-use on average than non-LGBTQ+ participants. Age was a significant predictor of co-use ($p < .01$); the rate ratio was 1.077, indicating that older students reported more co-use, with each year older being associated with 8% more co-use. Ethnicity did not significantly predict co-use.

Hypothesis 2

Linear regression analyses. A series of linear regression models were conducted on only participants who identified as a member of the LGBTQ+ community, regressing mental health outcome variables (i.e., depression, anxiety, stress, and overall mood) on sense of LGBTQ+ community and controlling for age and ethnicity. Sense of LGBTQ+ community was not a significant predictor of depression, anxiety, stress, or overall mood; see Table 3 for full results. Ethnicity was a significant predictor of depression ($\beta = .191$, $p < .05$), stress ($\beta = .195$, $p < .05$), and overall mood ($\beta = .173$, $p < .05$), with effects in the small to moderate range and indicating higher levels of depression, stress, and mood-related symptoms among non-Hispanic/Latinx participants compared to Hispanic/Latinx participants.

Negative binomial regression analyses. A series of negative binomial regression models were conducted on only participants who identified as a member of the LGBTQ+ community, regressing substance use variables (i.e., alcohol use, cannabis use, and alcohol and cannabis co-use) on sense of LGBTQ+ community and controlling for age and ethnicity. Sense of LGBTQ+ community was not a significant predictor of any of the substance use outcomes, with all rate ratios less than 1.03; see Table 8 for full results.

Table 8. Negative binomial regression results for substance use variables regressed on sense of LGBTQ+ community among LGBTQ+ students.

	Rate Ratio	Estimate	Std. Error	*p*-value
Alcohol Use	1.013	0.013	0.025	0.61
Cannabis Use	1.003	-0.003	0.023	0.90
Co-use	1.024	0.024	0.028	0.40

Hypothesis 3

Exploratory testing for Hypothesis 3 relies on the categories of four identities described earlier in the Methods section. Calculations and comparisons involving intersections of only two or three identities at a time will not be made, as this would lead to the erasure of one to two other identities. It would also result in redundant findings; for example, differences between three identities at once and all four identities would likely be small and difficult to interpret. Interpreting intersections of all four identities at once is most meaningful in the context of intersectional research, as it is consistent with the concept that all identities that a person carries are bound up together and not separable from one another (Crenshaw, 1989; Crenshaw, 1991; Else-Quest & Hyde, 2016). Because of small sample sizes among many of these intersections of four identities, however, statistical comparisons such as t-tests between means of mental health outcomes for each of these groups within the LGBTQ+ student community in the sample would

be misleading and result in dichotomous decision making. By emphasizing descriptive statistics and effect size estimates, the focus is not on whether or not a difference is statistically significant, but rather the magnitude and direction of the effect. Figures 1-7 show median responses of each group across the following outcomes, respectively: depression, anxiety, stress, overall mood, alcohol use, cannabis use, and alcohol and cannabis co-use. These figures depict all intersections of identity with two or more members belonging to the group, so that a mean could be calculated. Figures were created using the "yarrr" package in R (Phillips, 2017). Cohen's *d* was calculated to determine the size of differences between groups based on mean and standard deviation. Only large differences will be reported in order to increase the likelihood of generalizable findings. Furthermore, only groups with six or more students will be compared. This cutoff of six or more students was based on the distribution of the data and the point at which effect size estimates can become unstable.

Regarding comparisons of overall mood concern scores, the following differences were noted. Of 300 pairwise comparisons made, 13 showed negligible differences, 14 showed small differences (cutoff: $d = 0.2$), 19 showed moderate differences (cutoff: $d = 0.5$), and 45 showed large differences (cutoff: $d = 0.8$); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, four comparisons involved groups of 6 participants or more. First, there was a large difference in overall mood concern scores between White, non-Hispanic cisgender gay men and White, non-Hispanic cisgender lesbian women ($d = 1.088$); White, non-Hispanic cisgender gay men ($M = 37.5$, $SD = 4.9$) had a more favorable outcome (i.e., lower average score) than White, non-Hispanic cisgender lesbian women ($M = 49.1$, $SD = 14.3$). White, non-Hispanic bi/pan cisgender men ($M = 36.1$, $SD = 12.2$; $d = 0.978$), non-White, non-Hispanic bi/pan cisgender women ($M = 40.5$, $SD = 13.0$; $d = 0.907$),

and White, Hispanic bi/pan cisgender women (M = 38.1, SD = 9.2; d = 0.915) also had substantially more favorable overall mood scores compared to White, non-Hispanic cisgender lesbian women.

Regarding comparisons of depression scores, the following differences were noted. Of 300 pairwise comparisons made, 15 showed negligible differences, 16 showed small differences (cutoff: d = 0.2), 20 showed moderate differences (cutoff: d = 0.5), and 40 showed large differences (cutoff: d = 0.8); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, only one comparison involved groups of 6 participants or more. There was a large difference in depression scores between White, non-Hispanic bi/pan cisgender men and White, non-Hispanic cisgender lesbian women (d = 0.968); White, non-Hispanic bi/pan cisgender men (M = 13.0, SD = 1.9) had a more favorable outcome (i.e., lower average score) than White, non-Hispanic cisgender lesbian women (M = 17.0, SD = 6.9).

Regarding comparisons of anxiety scores, the following differences were noted. Of 300 pairwise comparisons made, 6 showed negligible differences, 22 showed small differences (cutoff: d = 0.2), 15 showed moderate differences (cutoff: d = 0.5), and 48 showed large differences (cutoff: d = 0.8); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, five comparisons involved groups of 6 participants or more. The largest difference was between White, non-Hispanic cisgender gay men and White, non-Hispanic cisgender lesbian women (d = 1.823), with White, non-Hispanic cisgender gay men (M = 10.6, SD = 1.4) showing more favorable (i.e., lower) scores than White, non-Hispanic cisgender lesbian women (M = 16.4, SD = 4.3). White, non-Hispanic, bi/pan cisgender men (M = 11.4, SD = 4.8; d = 1.111), White, non-Hispanic bi/pan cisgender women

(*M* = 12.9, *SD* = 4.4; *d* = 0.801), non-White, non-Hispanic, bi/pan cisgender women (*M* = 11.5, *SD* = 3.9; *d* = 1.783), and White, Hispanic bi/pan cisgender women (*M* = 11.6, *SD* = 3.4; *d* = 1.241) also had substantially more favorable anxiety scores than White, non-Hispanic cisgender lesbian women.

Regarding comparisons of stress scores, the following differences were noted. Of 300 pairwise comparisons made, 14 showed negligible differences, 26 showed small differences (cutoff: *d* = 0.2), 17 showed moderate differences (cutoff: *d* = 0.5), and 34 showed large differences (cutoff: *d* = 0.8); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, no comparisons involved groups of 6 participants or more.

Regarding comparisons of alcohol use, the following differences were noted. Of 300 pairwise comparisons made, 12 showed negligible differences, 22 showed small differences (cutoff: *d* = 0.2), 25 showed moderate differences (cutoff: *d* = 0.5), and 32 showed large differences (cutoff: *d* = 0.8); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, five comparisons involved groups of 6 participants or more. White, non-Hispanic, cisgender gay men (*M* = 2.6, *SD* = 3.0; *d* = 1.206), White, non-Hispanic, cisgender lesbian women (*M* = 5.1, *SD* = 6.5; *d* = 1.157), non-White, non-Hispanic bi/pan cisgender women (*M* = 1.5, *SD* = 3.0; *d* = 1.570), and White, Hispanic bi/pan cisgender women (*M* = 2.4, *SD* = 2.1; *d* = 1.318) all had substantially lower levels of weekly alcohol use than White, non-Hispanic bi/pan cisgender men (*M* = 8.8, *SD* = 6.5). There was also a large difference in which non-White, non-Hispanic bi/pan cisgender women drank substantially less alcohol each week than White, non-Hispanic bi/pan cisgender women (*M* = 7.5, *SD* = 9.6; *d* = 0.928).

Regarding comparisons of cannabis use, the following differences were noted. Of 300 pairwise comparisons made, 23 showed negligible differences, 4 showed small differences (cutoff: $d = 0.2$), 24 showed moderate differences (cutoff: $d = 0.5$), and 39 showed large differences (cutoff: $d = 0.8$); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, only one comparison involved groups of 6 participants or more. There was a large difference in cannabis use between White, non-Hispanic bisexual/pansexual cisgender men and non-White, non-Hispanic bisexual/pansexual cisgender women ($d = 0.851$); non-White, non-Hispanic bisexual/pansexual cisgender women had a more favorable outcome (i.e., lower average score; $M = 1.2$, $SD = 2.1$) than White, non-Hispanic bisexual/pansexual cisgender men ($M = 3.2$, $SD = 2.6$).

Regarding comparisons of alcohol and cannabis co-use, the following differences were noted. Of 300 pairwise comparisons made, 11 showed negligible differences, 15 showed small differences (cutoff: $d = 0.2$), 23 showed moderate differences (cutoff: $d = 0.5$), and 39 showed large differences (cutoff: $d = 0.8$); the rest were comparisons made with intersections of identity that contained only one participant. Among large differences, three comparisons involved groups of 6 participants or more. The largest difference between White, non-Hispanic cisgender gay men and White, non-Hispanic cisgender lesbian women ($d = 1.105$), with White, non-Hispanic cisgender gay men showing more favorable (i.e., lower; $M = 0.1$, $SD = 0.4$) scores than White, non-Hispanic cisgender lesbian women ($M = 1.1$, $SD = 1.2$). One other group, White, Hispanic, bisexual/pansexual cisgender women ($M = 0.8$, $SD = 0.9$), showed substantially higher weekly co-use compared to White, non-Hispanic, cisgender gay men ($d = 0.926$). One other group, 2132 ($M = 0.3$, $SD = 0.5$), showed substantially lower weekly co-use compared to White, non-Hispanic, cisgender lesbian women ($d = 0.910$).

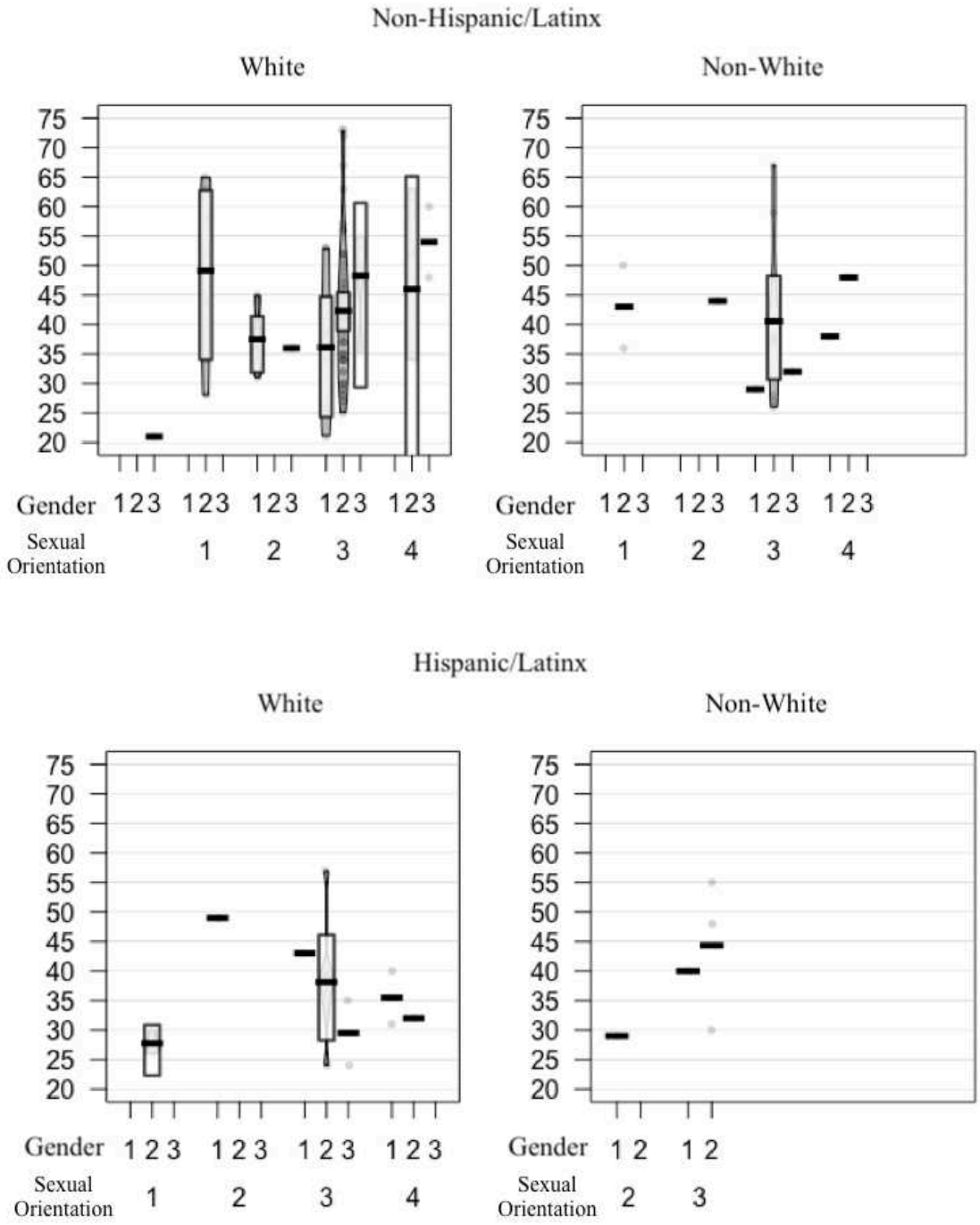

Figure 1. Overall mood concern scores (*y*-axis represents total DASS-21 score, with possible scores from 21 to 84) for students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

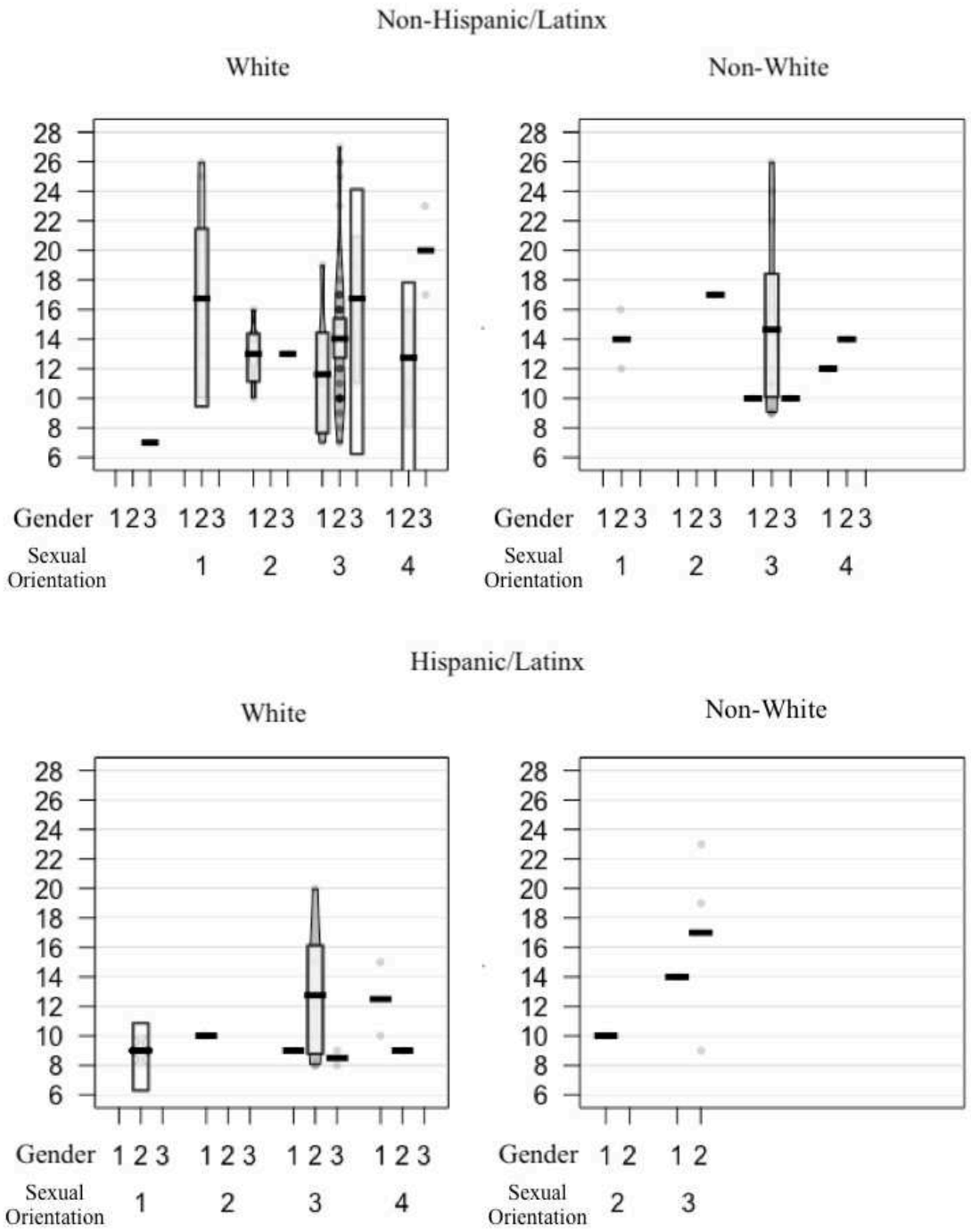

Figure 2. Depression scores (*y*-axis represents sum of seven Depression items from DASS-21, ranging from 7 to 28) for students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

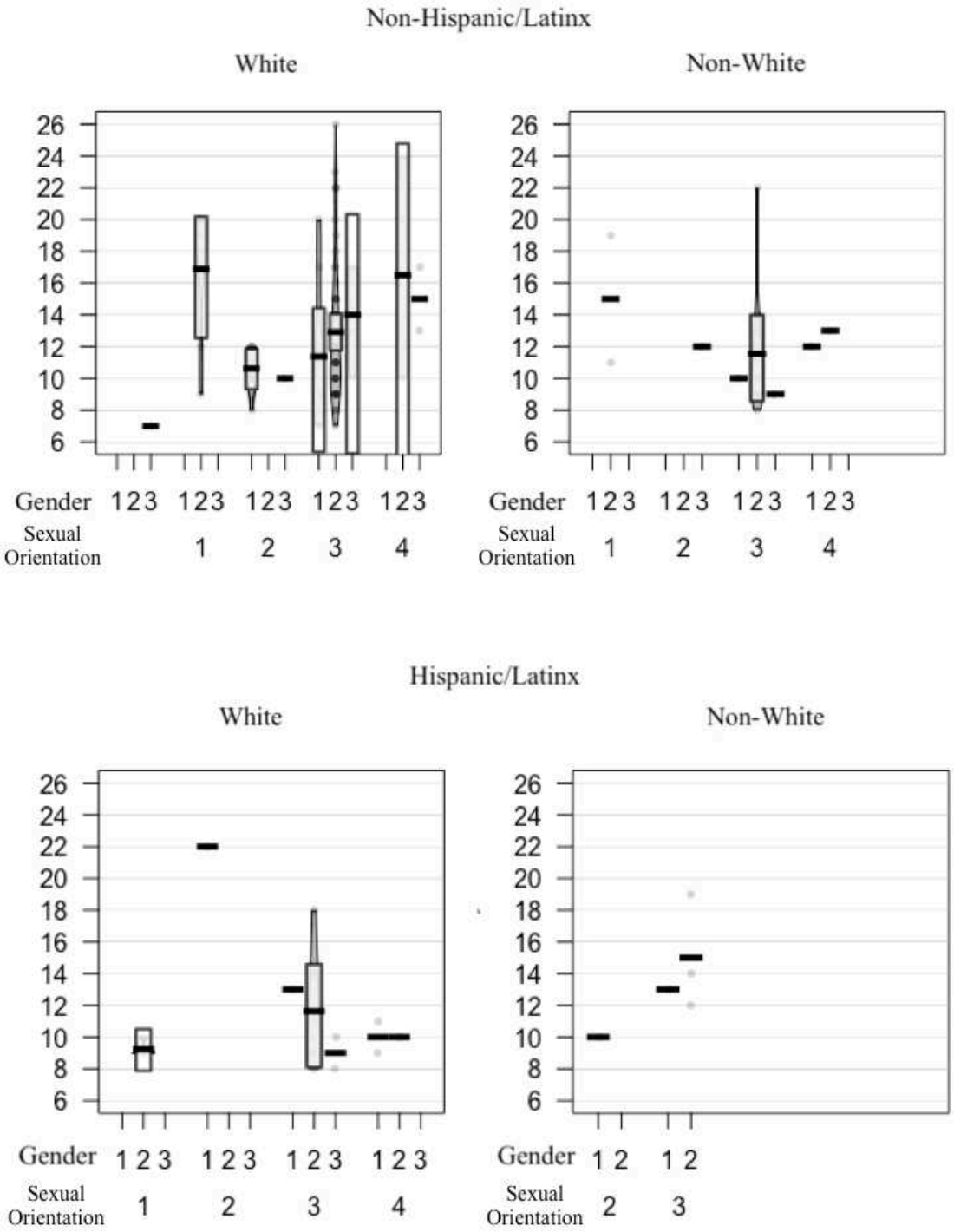

Figure 3. Anxiety scores (*y*-axis represents sum of seven Anxiety items from DASS-21, ranging from 7 to 28) for students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

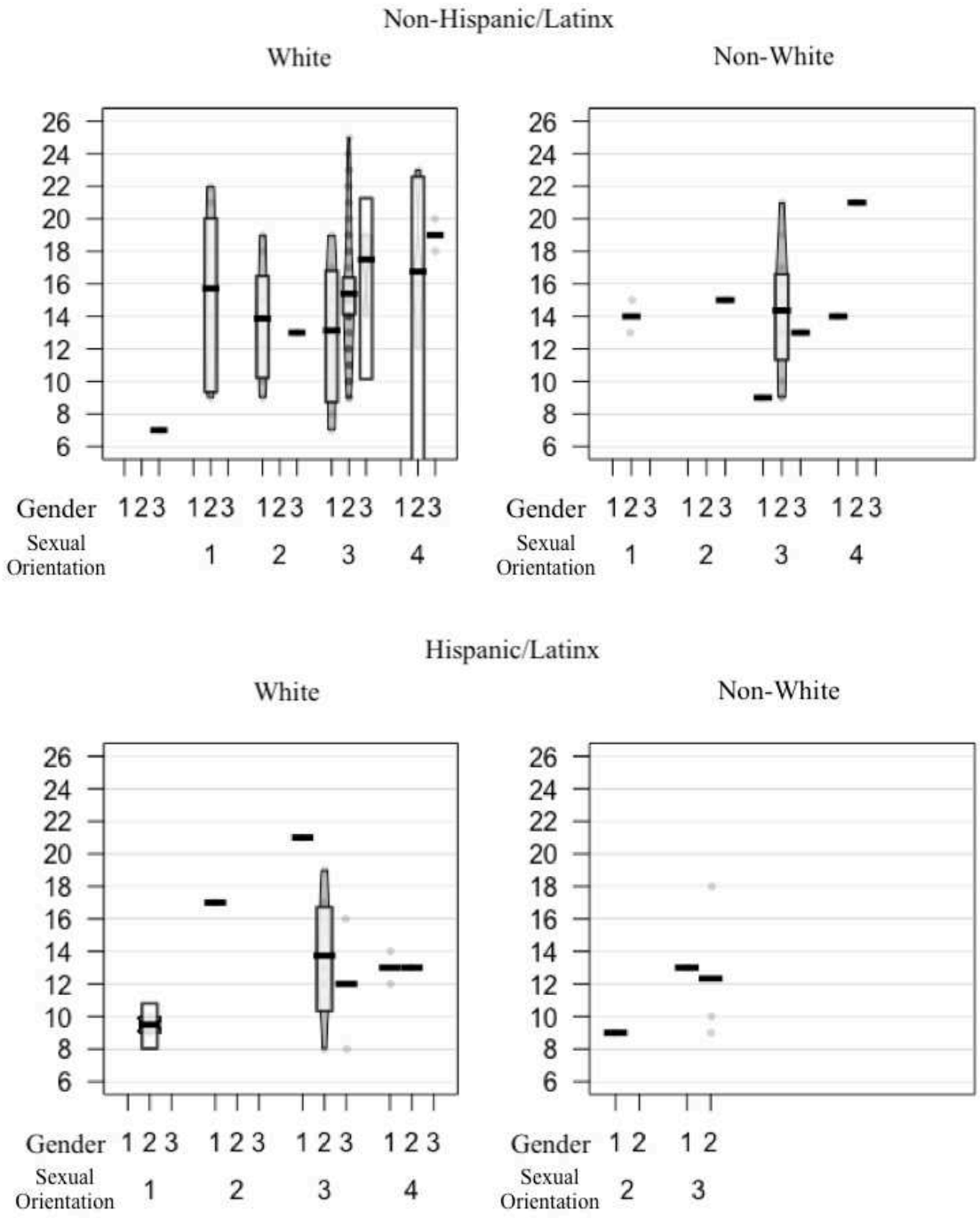

Figure 4. Stress scores (*y*-axis represents sum of seven Stress items from DASS-21, ranging from 7 to 28) for students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

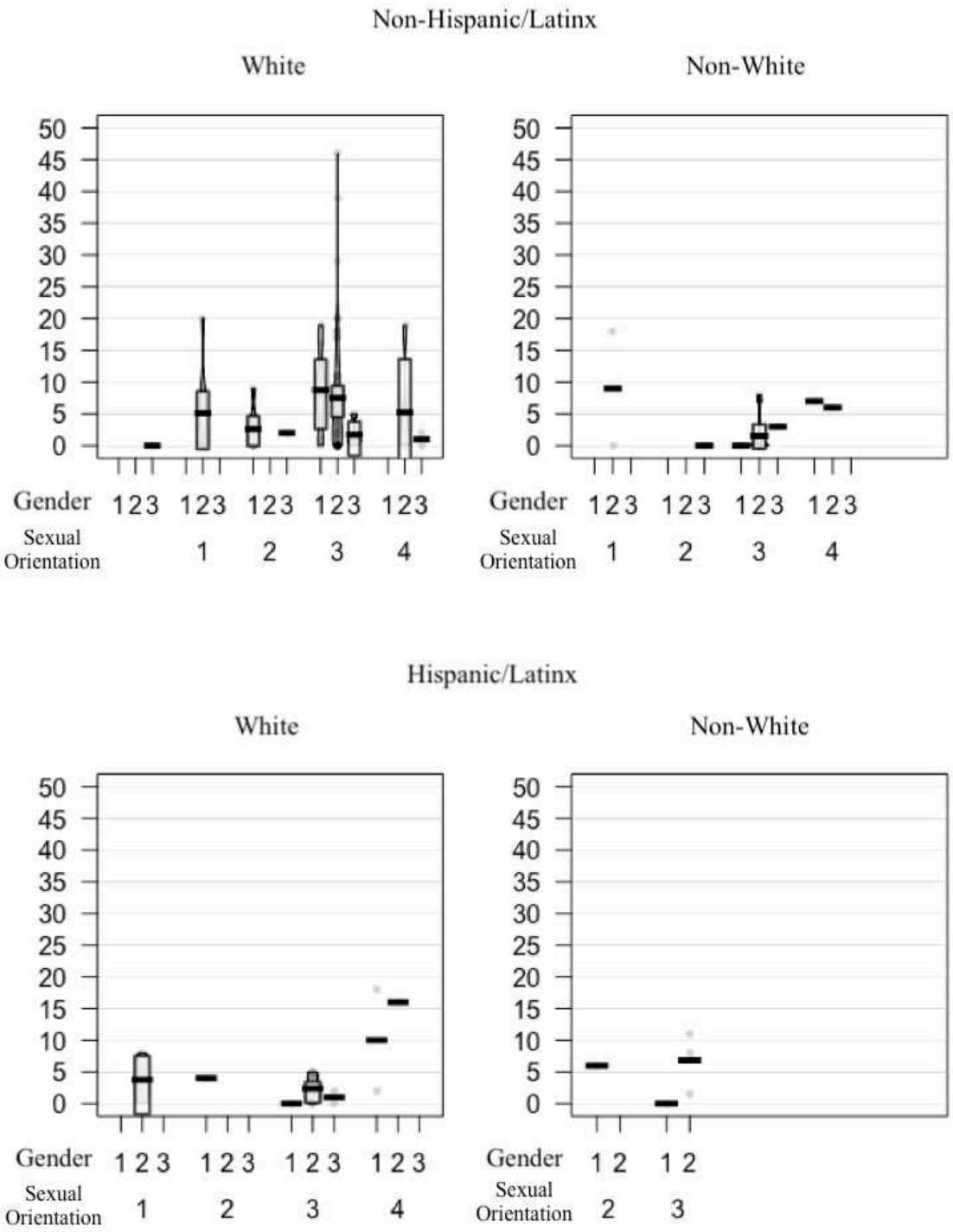

Figure 5. Weekly alcohol use (*y*-axis represents number of standard drinks consumed in an average week) of students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

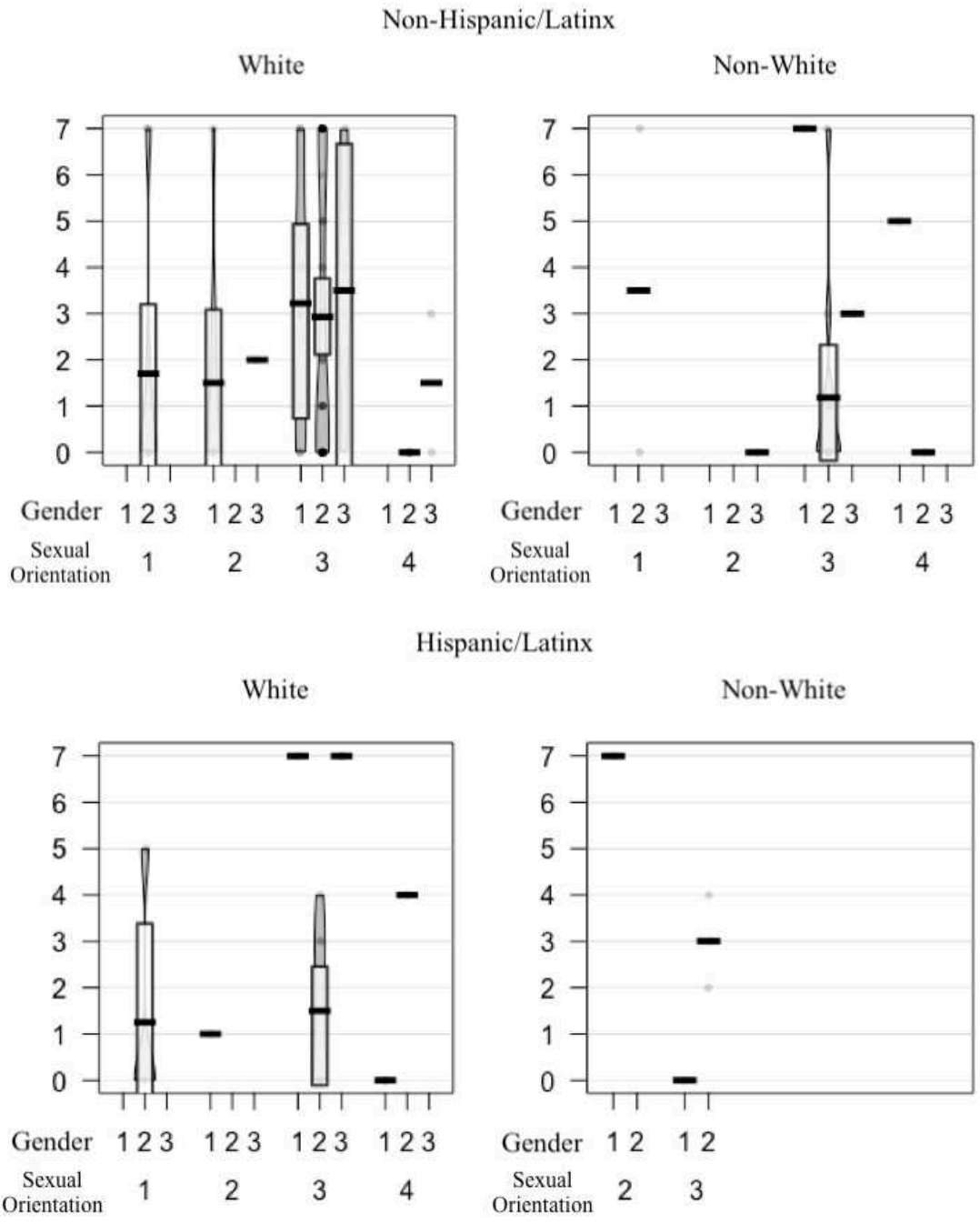

Figure 6. Weekly cannabis use (*y*-axis represents number of days in which cannabis was used during an average week) of students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

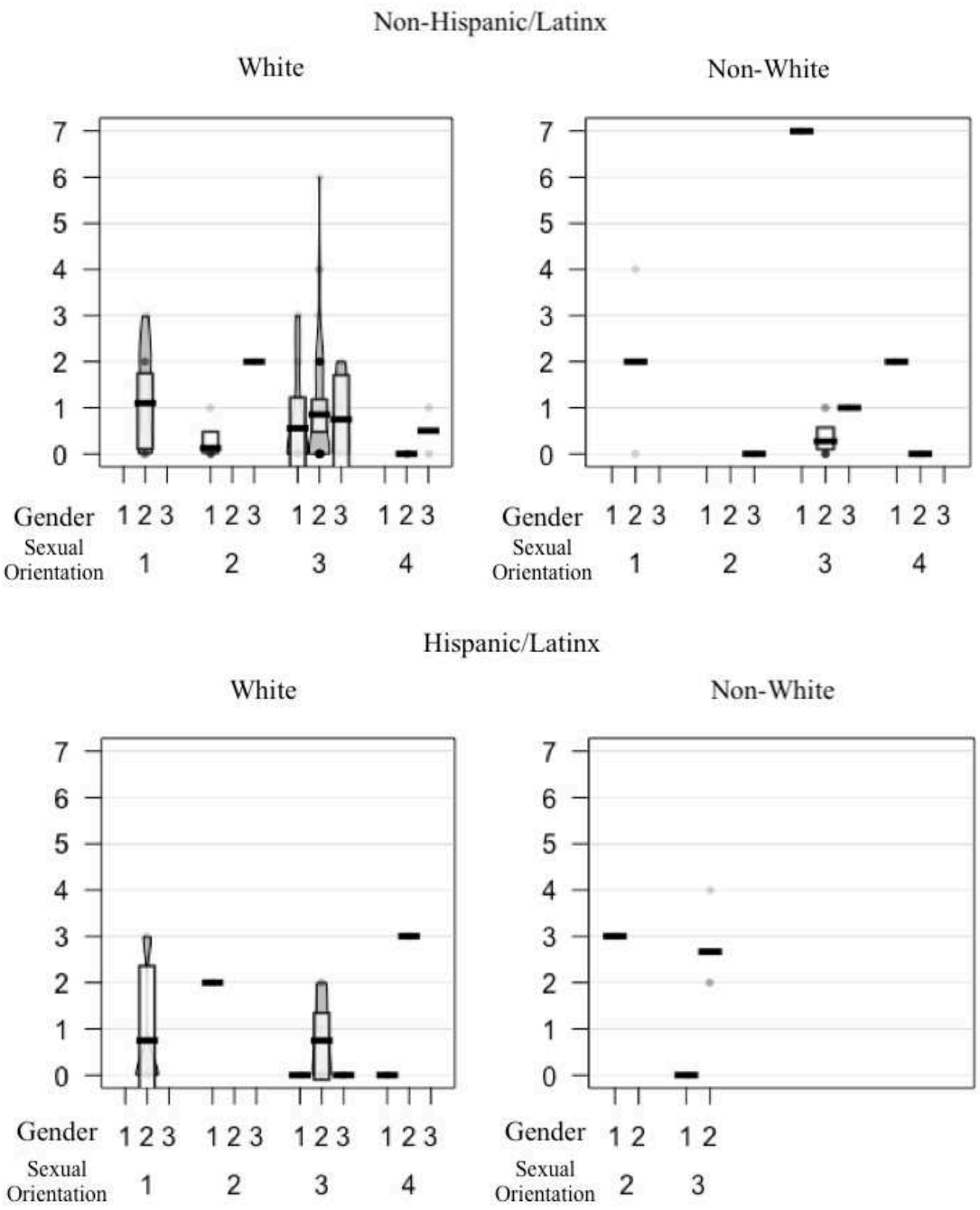

Figure 7. Weekly alcohol and cannabis co-use (*y*-axis represents number of days in which cannabis and alcohol were both used during an average week) of students by intersections of race, ethnicity, gender (1 = cisgender man, 2 = cisgender woman, 3 = gender minority), and sexual orientation (1 = lesbian, 2 = gay, 3 = bisexual/pansexual, 4 = other).

I also explored differences in relationships between key variables among groups by intersection of four identities. Specifically, for each group I calculated standardized regression coefficients (i.e., β) of the linear regression models describing the relationship between sense of LGBTQ+ community and mental health outcomes (i.e., overall mood, depression, anxiety, and stress). I used the R package "lme4" for these analyses (Bates et al., 2015). The following cutoffs for standardized β were used to determine strength of relationship (Cumming, 2013): 0.1 (small); 0.3 (moderate); 0.5 (large). For some groups of participants by intersections of identity, standardized β values greater than 0.1 were reported, suggesting at least a small relationship between the outcome and sense of LGBTQ+ community. All groups with standardized β values lower than 0.1 will not be reported, and it can be assumed that this suggests a lack of substantial relationship between the outcome and sense of LGBTQ+ community for members of that group. Tables containing these values can be found in Appendix C (Tables 9-12).

Regarding the association between sense of LGBTQ+ community and overall mood concerns, the following relationships were noted: for White, non-Hispanic cisgender gay men, there was a small to moderate positive relationship ($\beta = 0.13$), such that lower levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for White, non-Hispanic cisgender bisexual/pansexual men, there was a large negative relationship ($\beta = -0.82$), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for White, non-Hispanic cisgender lesbian women, there was a moderate to large negative relationship ($\beta = -0.48$), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for White, Hispanic cisgender lesbian women, there was a large negative relationship ($\beta = -0.85$), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood

concerns; for White, non-Hispanic, bisexual/pansexual cisgender women, there was a small to moderate negative relationship (β = -0.14), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for non-White, non-Hispanic bisexual/pansexual cisgender women, there was a moderate to large positive relationship (β = 0.47), such that lower levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for non-White, Hispanic bisexual/pansexual cisgender women, there was a large negative relationship (β = -1.00), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for White, non-Hispanic cisgender women with other sexual orientations, there was a small to moderate negative relationship (β = -0.25), such that higher levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns; for White, non-Hispanic bisexual/pansexual gender minorities, there was a moderate to large positive relationship (β = 0.47), such that lower levels of sense of LGBTQ+ community were associated with lower levels of overall mood concerns.

Regarding the association between sense of LGBTQ+ community and depression, the following relationships were noted: for White, non-Hispanic cisgender gay men, there was a moderate to large negative relationship (β = 0.38), such that lower levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, non-Hispanic cisgender bisexual/pansexual men, there was a large negative relationship (β = -0.68), such that higher levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, non-Hispanic cisgender lesbian women, there was a large negative relationship (β = -0.80), such that higher levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, Hispanic cisgender lesbian women, there was a large negative

relationship (β = -0.86), such that higher levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, non-Hispanic, bisexual/pansexual cisgender women, there was a small to moderate negative relationship (β = -0.13), such that higher levels of sense of LGBTQ+ community were associated with lower levels of depression; for non-White, non-Hispanic bisexual/pansexual cisgender women, there was a large positive relationship (β = 0.44), such that lower levels of sense of LGBTQ+ community were associated with lower levels of depression; for non-White, Hispanic bisexual/pansexual cisgender women, there was a large negative relationship (β = -0.99), such that higher levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, non-Hispanic cisgender women with other sexual orientations, there was a small to moderate positive relationship (β = 0.16), such that lower levels of sense of LGBTQ+ community were associated with lower levels of depression; for White, non-Hispanic bisexual/pansexual gender minorities, there was a large positive relationship (β = 0.76), such that lower levels of sense of LGBTQ+ community were associated with lower levels of depression.

Regarding the association between sense of LGBTQ+ community and anxiety, the following relationships were noted: for White, non-Hispanic cisgender gay men, there was a moderate to large negative relationship (β = -0.36), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for White, non-Hispanic cisgender bisexual/pansexual men, there was a large negative relationship (β = -0.88), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for White, non-Hispanic cisgender lesbian women, there was a small to moderate negative relationship (β = -0.19), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for White, Hispanic cisgender lesbian women, there was a large negative

relationship (β = -0.50), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for White, Hispanic, bisexual/pansexual cisgender women, there was a small to moderate positive relationship (β = 0.14), such that lower levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for non-White, non-Hispanic bisexual/pansexual cisgender women, there was a small to moderate positive relationship (β = 0.29), such that lower levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for non-White, Hispanic bisexual/pansexual cisgender women, there was a moderate to large negative relationship (β = -0.45), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety; for White, non-Hispanic cisgender women with other sexual orientations, there was a small to moderate negative relationship (β = -0.13), such that higher levels of sense of LGBTQ+ community were associated with lower levels of anxiety.

Regarding the association between sense of LGBTQ+ community and stress, the following relationships were noted: for White, non-Hispanic cisgender gay men, there was a small to moderate positive relationship (β = 0.12), such that lower levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, non-Hispanic cisgender bisexual/pansexual men, there was a large negative relationship (β = -0.68), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, non-Hispanic cisgender lesbian women, there was a small to moderate negative relationship (β = -0.13), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, Hispanic cisgender lesbian women, there was a large negative relationship (β = -0.87), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, non-Hispanic, bisexual/pansexual cisgender women, there

was a small to moderate negative relationship (β = -0.17), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for non-White, non-Hispanic bisexual/pansexual cisgender women, there was a moderate to large positive relationship (β = 0.44), such that lower levels of sense of LGBTQ+ community were associated with lower levels of stress; for non-White, Hispanic bisexual/pansexual cisgender women, there was a large negative relationship (β = -0.82), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, non-Hispanic cisgender women with other sexual orientations, there was a large negative relationship (β = -0.71), such that higher levels of sense of LGBTQ+ community were associated with lower levels of stress; for White, non-Hispanic bisexual/pansexual gender minorities, there was a large positive relationship (β = 0.53), such that lower levels of sense of LGBTQ+ community were associated with lower levels of stress.

I further explored differences in relationships between substance use variables among groups by intersection of four identities. Specifically, for each group I calculated rate ratios (RR) from models describing the relationship between sense of LGBTQ+ community and outcomes (i.e., alcohol use, cannabis use, and alcohol and cannabis co-use). Rather than negative binomial regression, quasi-poisson (QP) regression models were used due to evidence that these models outperform others, including negative binomial regressions, in analysis of count variables for substance use (Baggio et al., 2018). QP regressions were run using the "MASS" package in R (Venables & Ripley, 2002). Unstandardized regression coefficients were exponentiated to calculate the rate ratios reported below. Rate ratios below 0.99 and above 1.01 were considered substantial and included in the results below, and rate ratios larger than 100 were considered uninterpretable and not included. Full results can be found in Appendix C.

Regarding the association between alcohol use and sense of LGBTQ+ community, the following relationships were noted: for White, non-Hispanic bisexual/pansexual cisgender men, a one-unit increase in sense of LGBTQ+ community score was associated with a 18.2% decrease increase in alcohol use (RR = 0.818); for White, non-Hispanic, bisexual/pansexual cisgender men, a one-unit increase in sense of LGBTQ+ community was associated with a 7.7% increase in alcohol use (RR = 1.077); for White, Hispanic, cisgender men with other sexual orientations, a one-unit increase in sense of LGBTQ+ community score was associated with a 900% increase in alcohol use (RR = 9.000); for White, non-Hispanic cisgender lesbian women, a one-unit increase in sense of LGBTQ+ community score was associated with a 12.8% increase in alcohol use (RR = 1.128); for White, Hispanic cisgender lesbian women, a one-unit increase in sense of LGBTQ+ community score was associated with a 2.0% decrease in alcohol use (RR = 0.980); for White, Hispanic bisexual/pansexual cisgender women, , a one-unit increase in sense of LGBTQ+ community score was associated with a 21.9% increase in alcohol use (RR = 1.219); for non-White, non-Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 22.6% increase in alcohol use (RR = 1.226); for non-White, Hispanic bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 26.2% increase in alcohol use (RR = 1.262); for White, non-Hispanic cisgender women with other sexual orientations, a one-unit increase in sense of LGBTQ+ community score was associated with a 30.3% decrease in alcohol use (RR = 0.697); for White, Hispanic bisexual/pansexual gender minorities, a one-unit increase in sense of LGBTQ+ community score was associated with a 68.4% decrease in alcohol use (RR = 0.315).

Regarding the association between cannabis use and sense of LGBTQ+ community, the following relationships were noted: for White, non-Hispanic, cisgender lesbian women, a one-

unit increase in sense of LGBTQ+ community score was associated with a 23.3% decrease in cannabis use (RR = 0.767); for White, non-Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 2.3% decrease in cannabis use (RR = 0.977); for White, Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 19.9% decrease in cannabis use (RR = 0.801); for non-White, non-Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 23.8% increase in cannabis use (RR = 1.238); for non-White, Hispanic bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 7.3% increase in cannabis use (RR = 1.073); for White, non-Hispanic, bisexual/pansexual gender minorities, a one-unit increase in sense of LGBTQ+ community score was associated with a 31.9% decrease in cannabis use (RR = 0.681).

Regarding the association between alcohol and cannabis co-use and sense of LGBTQ+ community, the following relationships were noted: for White, non-Hispanic, bisexual/pansexual cisgender men, a one-unit increase in sense of LGBTQ+ community score was associated with a 28.7% increase in co-use (RR = 1.287); for White, non-Hispanic, cisgender lesbian women, a one-unit increase in sense of LGBTQ+ community score was associated with a 10.3% decrease in co-use (RR = 0.897); for White, non-Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 1.6% increase in co-use (RR = 1.016); for White, Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 2.4% decrease in co-use (RR = 0.976); for non-White, non-Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 37.0% increase in co-use (RR =

1.370); for non-White, Hispanic, bisexual/pansexual cisgender women, a one-unit increase in sense of LGBTQ+ community score was associated with a 5.3% decrease in co-use (RR = 0.947); for White, non-Hispanic bisexual/pansexual gender minorities, a one-unit increase in sense of LGBTQ+ community score was associated with a 42.8% decrease in co-use (RR = 0.572).

Discussion

In this study, I sought to explore the relationships between mental health outcomes, substance use, and sense of LGBTQ+ community. I further sought to explore how the intersections of individual identities, including race, ethnicity, gender, and sexual orientation, relate to these outcomes. This study provides a unique contribution to the literature in several ways. First, this data was recently collected and represent newer findings than many of the often-cited articles on mental health disparities related to sexual orientation; although there are some more recent articles published between 2015 and 2019, many other were published between 1995 and 2014. Thus, the results may be indicative of changes in attitudes toward and experiences of LGBTQ+ people over time. Another unique element of this dataset is that it was collected on a college campus in a specific geographic region (i.e., northern Colorado); therefore, the findings can be contextualized by LGBTQ+ community opportunities and culture specific to this location and to the resources provided by this campus. Furthermore, there is very little research on college student cannabis use in states like Colorado, in which it is legal to use recreationally for adults over the age of 21; this study represents a novel contribution regarding identity factors that may predict cannabis use on college campuses. Although similar topics like social support for LGBTQ+ people have been studied, there has been a general lack of attention in the literature to sense of LGBTQ+ community and how it relates to mental health and substance use outcomes among LGBTQ+ students. Lastly, although there has been an increase in studies that acknowledge and incorporate intersectional theory, this study is unique in incorporating intersections of four different identity variables; this allows those who read and interpret these results to avoid inappropriate generalization and/or viewing groups of a single identity as a monolith. Much of the research on intersectional identities has been qualitative, so this

quantitative approach to intersectionality is also somewhat novel and provides insights about the complexity of interactions between identities.

Hypothesis 1

No disparities were found in mental health and substance use outcomes between people who did and did not identify as members of the LGBTQ+ community, in the matched sample. This is inconsistent with many previous studies that demonstrated more favorable mental health outcomes among non-LGBTQ+ people compared to their LGBTQ+ counterparts. One potential explanation for findings of disparities in other studies has been the minority stress model, in which negative identity-related stressors were associated with poorer outcomes (e.g., Almeida et al., 2009; Mustanski, Andrews, & Puckett, 2016). Therefore, a possible explanation for this null finding is that LGBTQ+ students in general are experiencing fewer and/or less severe minority stressors in recent years, compared to previous years. Indeed, studies suggest that the general U.S. population has become more accepting of same-sex marriage in the past several decades (Baunach, 2012), which may translate to general attitudes toward LGBTQ+ people as well. Another possible explanation is that LGBTQ+ students are generally well-supported on this specific campus, or that the social climate of this region is conducive to LGBTQ+ wellbeing (i.e., because certain regions within the U.S. are more accepting of same-sex relationships and marriage than others; Jelen, 2017).

Interestingly, some of the expected health disparities were found in the unmatched sample, in which all LGBTQ+ people in the sample were compared to all non-LGBTQ+ people. Specifically, non-LGBTQ+ participants had lower levels of depression, anxiety, stress, overall mood concerns, and cannabis use compared to LGBTQ+ participants. These statistically significant differences found in the non-matched but not the matched samples may reflect a

power-related issue. Null Hypothesis Significance Testing relies on dichotomous decision making, drawn from *p*-values. *P*-values are known to be highly influenced by sample size (Cumming, 2013). In the unmatched sample, the overall sample size was orders of magnitude greater than in the matched sample size, which results in similar effect sizes as being interpreted as significant or non-significant depending on which comparison is used. As these findings emphasize, when samples and subsamples are small, there is a risk of either a Type I error with the whole sample or a Type II error with the matched sample. To avoid this issue, I focused my interpretation on effect sizes throughout this document, which provide more information about the magnitude and direction of effects, as well as an index of precision of the point estimate when confidence intervals are also reported. Furthermore, as the participants in the matched sample were matched along characteristics such as age and ethnicity, it is possible that differences between samples are more reflective of differences in mental health outcomes related to these other identities.

Contrary to predictions, regression models for alcohol use, cannabis use, and alcohol and cannabis co-use were not significant, controlling for age and ethnicity, suggesting no significant differences in alcohol and cannabis use and co-use between LGBTQ+ and non-LGBTQ+ people in the matched sample. Although these differences were not significant, use of rate ratios showed notable differences in substance use between LGBTQ+ and non-LGBTQ+ participants. Consistent with hypotheses, LGBTQ+ students reported higher levels of average weekly alcohol use, as well as alcohol and cannabis co-use, compared to non-LGBTQ+ students in the sample. Cannabis use was higher on average among non-LGBTQ+ students compared to LGBTQ+ students, contrary to expected results. The finding that LGBTQ+ students drank more alcohol during an average week compared to non-LGBTQ+ students is consistent with previous findings

suggesting higher levels of alcohol use, including heavy episodic drinking, among sexual minority youth compared to heterosexual youth (Talley et al., 2014). Although not assessed in this study, a possible explanation for this difference is the presence of sexual and/or gender minority-related stressors leading to increased use of alcohol as a coping mechanism, as noted in Wilson and colleagues' (2016) study on alcohol-related problems in sexual minority women; future research should seek to elucidate relationships between these variables. Another possible explanation is that alcohol use may be especially normalized for members of the LGBTQ+ community as a result of bar culture; researchers have noted that an LGBTQ+ bar culture emerged from a need for socialization among members of one's community that was not provided at other venues. One effect of this culture, according to one study, is increased alcohol use among those who participate in the LGBTQ+ bar or club scene (Lea, Reynolds, & de Wit, 2013).

This 13% difference in alcohol use between LGBTQ+ and non-LGBTQ+ students may, in part, account for the 9% difference between LGBTQ+ and non-LGBTQ+ students in alcohol and cannabis co-use, in the same direction. Currently, no studies have documented alcohol and cannabis co-use by LGBTQ+ community affiliation, making it a unique contribution of this study. There was, however, an 8% difference in cannabis use between groups in this sample, with non-LGBTQ+ students consuming more cannabis during an average week than LGBTQ+ students. This is contrary to predictions formed based on data showing higher levels of illicit drug use, including cannabis, among sexual minority youth in some samples (e.g., Corliss et al., 2012), though it is worth noting that the present study took place in a state in which recreational cannabis use is legal for adults. In general, little is known about the factors that predict cannabis use among LGBTQ+ students specifically, making possible explanations for this study's finding

purely speculative. One consideration is that LGBTQ+ bar culture, discussed within the context of the findings about alcohol use differences, appears to focus on promotion and normalization of alcohol and other drug use, with no specific pressure toward, or culture surrounding, cannabis use (Lea, Reynolds, & de Wit, 2013). Thus, one of the factors that may produce the alcohol use disparity is not present for cannabis use.

These substance use-related regression models were also conducted in the full, unmatched sample. As in the matched sample, alcohol use, as well as alcohol and cannabis co-use, did not significantly differ by LGBTQ+ identity. The 24% difference in co-use was in the same direction as in the matched sample, with LGBTQ+ people reporting higher levels of co-use; however, in the full sample, there was a 14% difference in alcohol use in the opposite direction as in the matched sample. In the full sample, LGBTQ+ people had, on average, lower levels of alcohol use. This likely suggests that there was something notable about participants who were removed in the matching procedure (e.g., perhaps a certain group was systematically removed in the matched sample due to the identities of the LGBTQ+ sample). Furthermore, cannabis use significantly differed between groups, with LGBTQ+ students consuming 41% more cannabis on average than non-LGBTQ+ students. Again, this is in the opposite direction of the finding in the matched sample.

Beyond LGBTQ+ identity, age and ethnicity were significant predictors of some substance use in the full sample. Specifically, ethnicity significantly predicted alcohol use, such that non-Hispanic/Latinx participants reported 41% more alcohol use during an average week than Hispanic/Latinx participants. This finding is contrary to previous results suggesting that Hispanic/Latinx people experience more social disadvantages than non-Hispanic people and, in turn, report more problematic alcohol use (Mulia et al., 2008). In this case, Hispanic/Latinx

identity appeared to be protective against high levels of alcohol use in an average week; one possible explanation for this finding is that Hispanic/Latinx identity is a source of resilience, an idea that should be explored in future research. Age significantly predicted both cannabis use and alcohol and cannabis co-use; a one-year increase in age represented an 8% increase in cannabis use and an 8% increase in co-use. Because the age range of participants in this study was somewhat limited by the context of undergraduate student status, it is not appropriate to generalize these age-related findings to the general population. However, as increased age typically correlates with advancement in year of undergraduate education, it may be that stress increases over the course of each year of education, such that each year represents an increase in use of cannabis and co-use as a coping mechanism for that stress. Little attention has been paid to this phenomenon in the literature, and should be further explored in future research.

Hypothesis 2

The predicted relationship between sense of LGBTQ+ community and mental health outcomes, such as anxiety, depression, stress, overall mood, alcohol use, cannabis use, and co-use, was not supported in this sample of LGBTQ+ people. Although this result is somewhat surprising in the context of the literature suggesting the importance of sense of LGBTQ+ community (e.g., Frost, 2014; Poteat et al., 2012), there are several possible explanations for this finding. One is that this study was conducted with undergraduate students, which limits generalizability of the findings. For example, college is a unique environment in which students are consistently provided with multiple opportunities to connect with others, in the form of dormitories, clubs and organizations, and classes. It is possible that, if these or other provisions meet students' needs related to sense of community and connectedness with others, LGBTQ+-specific community is less important to mental health outcomes. In a community sample, in

which the onus may often be on the individual rather than the university to seek group affiliation and opportunities for connection, it could be that sense of LGBTQ+ community has a stronger association with mental health outcomes. It is also possible that, as acceptance of LGBTQ+ identities increases in the U.S., it becomes less important for LGBTQ+ people to rely on friends with similar identities in order to access connection, understanding, and support.

Another possible explanation for this null finding is that the variable "sense of LGBTQ+ community" was not an accurate representation of the intended construct. For example, in Relational Cultural Theory (RCT), mutually empathic relationships are central to why connection and community are emphasized (Jordan, 2001; Jordan, 2010). Although the PSOC-LGBT was found to be reliable and valid in previous research (Frost & Meyer, 2012) and showed appropriately strong internal consistency in this study, it focuses more on factors such as influence within the community (e.g., the extent to which an individual believes they can influence and are influenced by the LGBTQ+ community) and community membership (e.g., the extent to which an individual feels they are a part of the LGBTQ+ community), without attention to the quality of relationships forged with members of the community. Even the items focused on "shared emotional connection" ask respondents to consider how they think LGBTQ+ people treat each other and act toward one another in general, without asking their individual experiences within the community. Per RCT, a scale that assessed personal experiences of mutual empathy, empowerment, and authentic connection within LGBTQ+ community spaces and relationships may provide a more meaningful variable of interest for a study of this nature.

Among LGBTQ+ community members, ethnicity significantly predicted depression, stress, and overall mood, with higher levels of each outcome (i.e., poorer outcomes) among non-Hispanic/Latinx students compared to Hispanic/Latinx students. This is consistent with prior

research showing more prevalence of major depressive episodes among non-Hispanic White participants compared to other groups, including Hispanic/Latinx people (Mojtabai, Olfson, & Han, 2016). It suggests the possibility of a cultural protective factor that could be explored in future research.

Hypothesis 3

Because of the relatively small size of the LGBTQ+ student sample, intersections of identity were investigated in an exploratory way. For example, only a fraction of possible intersections of identity were represented and, of those that were, many only had representation from one person in the sample. Thus, it is difficult to draw generalizable conclusions from the data. However, relevant trends will be tentatively discussed as they may provide some preliminary insight into how combinations of identity may relate to sense of LGBTQ+ community, mental health, and substance use outcomes, as well as suggest areas for future study. These limitations highlight the challenges and complexities of conducting quantitative intersectional research, particularly with smaller samples. Further, this underscores the importance of conducting qualitative research in conjunction with quantitative analyses to elucidate critical differences among groups and to understand how data map onto participants' lived experience.

Regarding single identity comparisons, some data was inconsistent with existing health disparities data, for example, that non-White LGBTQ+ students had slightly more favorable mental health outcomes (e.g., lower levels of anxiety and stress), overall mood) compared to non-White LGBTQ+ students. That non-White students had lower levels of alcohol use was consistent with prior research suggesting higher levels of drinking and drinking-related problems among White youth compared to other racial groups (with the exception of Native American

youth; Xueqin & Shive, 2000). However, similar levels of cannabis use among non-White students were inconsistent with prior findings that non-White racial identity was a risk factor for regular cannabis use (Pacek, Mauro, & Martina, 2015); this may be reflected in White students' lower levels of co-use relative to non-White students. Finally, the nearly-equivalent average scores on the measure of sense of LGBTQ+ community contrasted with evidence that LGBTQ+ people of color face exclusion within largely White LGBTQ+ community spaces (Han, 2007).

Another single intersection reported among LGBTQ+ students was ethnicity. In this case, non-Hispanic/Latinx LGBTQ+ students showed slightly lower (i.e., more favorable) average levels of depression, anxiety, stress, overall mood concerns, and alcohol and cannabis co-use relative to Hispanic/Latinx LGBTQ+ students. This was consistent with prior studies showing some ethnicity-based disparities in mental health outcomes, favoring non-Hispanic people (e.g., Meeske et al., 2013). Non-Hispanic/Latinx LGBTQ+ students showed slightly lower levels of co-use relative to their Hispanic/Latinx counterparts; as co-use is understudied, this is a novel finding. Contrary to predictions, Hispanic/Latinx LGBTQ+ students showed a slightly higher average sense of LGBTQ+ community compared to non-Hispanic/Latinx LGBTQ+ students. As with the findings regarding White vs. non-White race among LGBTQ+ students, these results show mixed relationships between identity variables and mental health outcomes, in which marginalized identity appears neutral or protective in some ways and detrimental in others.

Mental health, substance use, and sense of LGBTQ+ community were also explored by sexual orientation identity. As shown in Table 5, there were some clear, consistent patterns of disparities by sexual orientation present among LGBTQ+ students in this sample. One consistent trend was that students who were gay men showed more favorable outcomes across mental health (e.g., mood, depression, anxiety) and substance use (e.g., alcohol use) outcomes relative to

lesbian students. This was similar to the comparisons between bisexual/pansexual students and gay students, in which gay students had more favorable scores on overall mood, anxiety, stress, alcohol use, and cannabis use compared to bisexual/pansexual students. Findings were mixed when comparing bisexual/pansexual students to lesbian students. This is consistent with the prediction that community members facing lower levels of discrimination (e.g., gay men, relative to lesbian women and bisexual/pansexual people of any gender) are likely to have more favorable outcomes. Somewhat contrary to findings suggesting that bisexual and pansexual individuals tend to face exclusion from the LGBTQ+ community (Barker, 2004; Esterberg, 2011; Martin & Pallotta-Chiarolli, 2009) as well as poorer mental health outcomes relative to gay and lesbian individuals (e.g., Jorm et al., 2002; Marshal et al., 2008), bisexual and pansexual students had lower average levels of anxiety than lesbian students and higher levels of sense of LGBTQ+ community than lesbians. Though not specifically investigated in this study, it is worth noting that bisexual and pansexual identities represented approximately 67% of LGBTQ+ students in this study; it is possible that the increasing numbers of people identifying as bisexual/pansexual has contributed to a stronger sense of acceptance and inclusion within the broader LGBTQ+ community.

Outcomes by gender also showed variability in results, some of which were inconsistent with predictions that cisgender students would experience more favorable outcomes than gender minority students, related to their unique experiences of gender-related oppression and discrimination. Rather, gender minority students showed lower levels of anxiety than cisgender women, lower levels of alcohol use than cisgender men and women, a higher sense of LGBTQ+ community than cisgender men. In other instances, though, they showed less favorable outcomes

than their cisgender counterparts, suggesting that gender-related experiences and stressors are complex and worth exploring in greater depth in future studies.

Cisgender men consistently showed the lowest (i.e., most favorable) levels of mood-related concerns, including depression, anxiety, stress, and overall mood, compared to students of other genders; this consistent with minority stress theory, which would suggest that cisgender men may experience the most favorable outcomes as both cisgender women and gender minority students experience forms of oppression and minority stress related to their gender identity. Finally, both gender minority students and cisgender women had a substantially higher sense of LGBTQ+ community than cisgender men, contrary to predictions that cisgender women and men would have higher levels of sense of community compared to gender minorities because of gender minority community members' perceptions of exclusion within the broader LGBTQ+ community (Blair & Hoskin, 2019; Davidson, 2007; Stone, 2009).

Mean scores on mental health and substance use outcomes were also compared among groups by intersections of all four identities of interest (i.e., race, ethnicity, gender, and sexual orientation). Due to the small sizes of many of these groups, some of which contained only one participant, many findings were not reported. However, the sheer number of large differences in mean outcomes between groups is indicative of the importance of viewing outcomes by intersections of identity. Should similar means be found in intersecting groups with larger sample sizes, there might be clear mental health and substance use disparities that emerge based on intersections of identities. Although small sizes of groups means that these exploratory findings should not be generalized or over-interpreted, some patterns did emerged among groups with six or more participants, which may warrant further study.

For example, findings showed that White, non-Hispanic cisgender lesbian women had higher and therefore less favorable overall mood concern scores compared to multiple other groups. This is contrary to predictions considering that they experience the intersections of racial, ethnic, and cisgender privilege, and that they are not excluded on the basis of attraction to multiple genders, as other LGBTQ+ community members (e.g., bisexual and pansexual people) are. However, White, non-Hispanic cisgender gay men had much lower and more favorable average scores, a trend that persisted across other relevant outcomes, including overall mood, anxiety, alcohol use, and co-use. This trend was expected, as that group represent the intersections of racial, ethnic, cisgender, and gender privilege, in addition to lack of exclusion due to attraction to multiple genders. As privilege is often associated with a lack of minority stress and more access to resources, people with privilege may be expected to have more favorable mental health and substance use outcomes. On the other hand, research has shown that people with marginalized identities may have higher levels of resilience than people with privileged identities in some contexts (e.g., Blanc et al., 2020), which may help explain some of the variability and complexity in results throughout Hypothesis 3. It could be that experiencing new stressors unique to the college experience is sometimes associated with worse outcomes for groups of people who have experienced multiple forms of privilege (e.g., White, non-Hispanic cisgender lesbian women), as they may not have developed the resilience that allows others, such as people of color, to recover from stressful events and experiences.

Regarding other findings based on four intersecting identities, results showed variation, underscoring the value of intersectional research. Specifically, changes in one or two identities, holding the others constant, can result in substantially different outcomes. For example, there was a large difference in anxiety between White, non-Hispanic, bisexual/pansexual cisgender

women and White, non-Hispanic cisgender lesbian women. In this case, the shift in sexual orientation identity alone was associated with substantially different levels of anxious symptoms. As researchers adopt intersectional designs more widely and with larger samples at each intersection of identity, there may be an increase in groups with more than six members, and more clear patterns of results are likely to emerge. Such patterns can be used to determine disparities, inform treatments and other interventions, and inform the allocation of campus and community resources to remedy disparities.

The last element of Hypothesis 3 involved comparisons of the relationship between sense of LGBTQ+ community and mental health/substance use outcomes by intersections of four identities. Whereas Hypothesis 2 showed null results when assessing the associations between sense of LGBTQ+ community and relevant outcomes among all LGBTQ+ students, there were notable relationships between those variables for certain groups of students. For most groups by intersections of four identities, the relationships between sense of LGBTQ+ community and other outcomes were in the direction of the predicted findings. Specifically, for most groups with a meaningful relationship between the variables, higher levels of sense of LGBTQ+ community were associated with more favorable (i.e., lower) outcomes (e.g., lower overall mood concerns, lower depression scores, etc.). In many cases, two to three groups had a positive association, with higher levels of LGBTQ+ community associated with poorer (i.e., higher) outcomes. For mental health outcomes, non-White, non-Hispanic bisexual/pansexual cisgender women (i.e., for overall mood, depression, anxiety, and stress), White, non-Hispanic cisgender gay men (i.e., for overall mood, depression, and stress), and White, non-Hispanic bisexual/pansexual gender minorities (i.e., for overall mood, depression, and stress) were most commonly experiencing sense of LGBTQ+ as a possible detriment to mental health outcomes, whereas many other groups were

experiencing the opposite. It is unclear why some of these relationships were positive (i.e., higher sense of LGBTQ+ community associated with poorer/higher mood outcomes) whereas the rest were consistent with predictions.

Understandably, sense of LGBTQ+ community was often associated with higher levels of substance use, although there were exceptions (including groups in which sense of community and substance use had no relationship, as well as groups in which sense of community appeared protective against high levels of use). Although these findings contrast with predictions that heightened sense of LGBTQ+ community may protect against higher levels of alcohol and cannabis use, research has documented that LGBTQ+ community spaces often center substance use (Lea, Reynolds, & de Wit, 2013). Thus, it could be that LGBTQ+ students who are more strongly connected with the LGBTQ+ community are also spending more time drinking alcohol and/or consuming cannabis with other LGBTQ+ community members as part of social gatherings. White, non-Hispanic bisexual gender minority students, for example, consistently showed a negative relationship between sense of community and substance use outcomes, with higher levels of sense of LGBTQ+ community being associated with lower levels of alcohol use, cannabis use, and co-use. It is not clear why this group, along with a few other groups, may experience sense of community as protective from higher substance use while many more groups show no association or consume more substances when feeling a stronger sense of community. Regardless, such findings continue to demonstrate why researchers should apply an intersectional lens to analyses. Simply accepting the null findings of Hypothesis 2 would not allow the full picture of sense of LGBTQ+ community to emerge, whereas an intersectional analysis shows the complexities and nuances of mental health and substance use correlates by identity.

Overall, the results from this hypothesis suggest great variation in outcomes between groups. This implies that intersections of identities are crucial to understanding mental health and relationships between relevant variables. Although the sample sizes for individual groups were small, limiting generalizations about specific intersections of identities, the variation in outcomes is meaningful. In particular, intersectional considerations should be a feature of culturally competent, oppression-informed future research on mental health, substance use, and experiences of LGBTQ+ community.

In terms of treatment and intervention recommendations based on these findings, the small sample sizes again make it difficult to give clear, identity-based recommendations. Rather, clinicians and other service providers should strive to integrate an understanding of their clients/people they serve as whole people with multiple intersecting identities, all of which are likely to inform their presenting concerns and treatment/intervention needs. Supporting LGBTQ+ students in connecting with the broader LGBTQ+ community may be helpful in some cases and detrimental in others, and service providers should exercise caution about the possible advantages and disadvantages for the recipient of services. Specifically, clinicians should take care to assess for identity-specific contributors to their psychological distress. It may also be important for clinicians to ask clients about their experiences within the LGBTQ+ community, including aspects that may be helpful and others that may be harmful. Both the clinician's individual treatment for their client, as well as their advocacy for the client and the LGBTQ+ community, can be informed by their client's lived experiences across identities. Further, clinicians should exercise care and caution in applying empirically supported treatments (ESTs) to their clients, keeping in mind the client's combination of identities. Considering that results from this study were drastically different when analyzing the LGBTQ+ student community as a

whole compared to analyzing groups by intersection of identities, it is likely that research on ESTs may fall short in similar ways because of a lack of investigation of how individuals who hold various intersectional identities may respond differently to a given treatment approach. There are currently some cases in which researchers have developed and studied treatments for specific groups of a single identity, such as a modified cognitive behavioral therapy (CBT) treatment for African American adults (Ward & Brown, 2015), and even some for intersecting identities (e.g., culturally adapted CBT for Latinx women with PTSD; Hinton et al., 2011). However, many larger studies investigating the outcomes of ESTs do not consider these adaptations, nor do they measure disparities in treatment outcomes by intersection of identities. As many successful ESTs exist and are commonly used in counseling, it is now necessary for researchers and clinicians to determine how and if they are effective for clients with various combinations of identities, particularly those who are not traditionally represented in research. Adames and colleagues (2018) provide an excellent framework for culturally competent, race-conscious psychotherapy, in which multiple identities are considered simultaneously and a client's lived experience is highly valued and integrated. Clinicians can look to their case of an AfroLatinx queer immigrant client for an example of understanding clients through multiple identities and aspects of systemic oppression.

Another important conclusion from these findings is that disparities are not as straightforward as assuming that those with the most marginalized identities have the poorest outcomes and those with the most privilege have the most favorable ones. The findings of this study consistently painted a much more complex picture than that, and future research with more representative and large samples may help elucidate patterns of disparities. Whereas the association between marginalization and unfavorable outcomes may be partially explained by the

minority stress model, the complexity of results warrants future research. One construct that may be worth investigating is resilience. Because identifying as a member of one or more marginalized groups was sometimes associated with better outcomes compared to identifying with fewer marginalized groups, it could be that belonging to a particular group is also associated with helpful skills and/or community connections that aid in coping with adversity. This is consistent with prior research suggesting that many people with marginalized identities appear to be protected from the damaging effects of discrimination by cultural strengths and sense of ethnic/racial identity (Neblett et al., 2012). Further, Asakura and Craig's (2014) analysis of LGBTQ+ stories for the *It Gets Better* social media campaign revealed multiple common narratives about resilience and coping. One narrative was about leaving hostile environments in favor of accepting ones; although existing in intolerant social, academic, and familial environments may represent an element of adversity and minority stress, this study suggested that it also allows many LGBTQ+ community members to deliberately seek out better circumstances and communities. Another narrative was that of coming out. One reported benefit of coming out was that it prompted LGBTQ+ people to connect with others with shared identities, leading to validation and normalization of LGBTQ+-specific experiences.

Limitations and Future Directions

Although the broader study of undergraduate students had an adequate sample size, the subset of LGBTQ+ community members within that sample was relatively small. Power analyses suggested that the sample size was adequate to determine effect sizes for Hypotheses 1 and 2. However, due to the further categorization by intersections of identity that was necessary for Hypothesis 3, many of the reported findings must be interpreted with caution, in order to avoid overgeneralization of groups based on few participants. Importantly, though, the analyses

conducted on this small sample of LGBTQ+ students may provide a template for conducting similar intersectional analyses on larger and more representative data in the future. Specifically, intersectional analyses with a large, nationwide community sample encompassing a broad range of ages, types of locations (i.e., rural, urban, suburban), and a higher proportion of LGBTQ+ community members of color would likely yield a deeper understanding of differences and similarities among mental health and substance use outcomes for various groups within the LGBTQ+ community.

The use of an undergraduate, single-university sample also limits the generalizability of the findings presented. Although this homogeneity allowed for unique data on cannabis use among students, particularly in a state in which cannabis use is legal in some contexts, this also meant that the sample was disproportionately White, non-Hispanic young adult women. All of them were enrolled as undergraduate students at the same university, suggesting an element of geographic and cultural similarity among participants as well. As discussed above, future research would produce more accurate, generalizable, and nuanced results with a robust community sample. This would be particularly important for analysis of outcomes and relationships between variables by intersection of multiple identities.

Future research may improve upon this study by utilizing more valid measures throughout. For example, the PSOC-LGBT scale, used to measure sense of LGBTQ+ community, contained items that did not assess the construct of interest (e.g., influence within the LGBTQ+ community); future research would obtain a clearer picture of RCT-related constructs such as emotional connection and mutual empathy by selecting or developing a scale that more directly measures the quality and depth of relationships among community members. Whereas the item measuring average weekly alcohol use assessed for average number of

standard drinks, providing a meaningful and standardized number for each student, cannabis and co-use items relied on asking participants how many days each week they used cannabis or co-used alcohol and cannabis. In the future, researchers may obtain more accurate results by developing a way of measuring amount of cannabis, or estimated amount of tetrahydrocannabinol (THC) consumed per day and per week. Such an instrument would be more sensitive to differences in actual use; the instruments used in this study, for example, would not distinguish between someone who used barely any cannabis once per day and someone who used cannabis in great quantities multiple times per day. Another consideration around measurement of substance use, which could be expanded on in future research, is the notion that not all substance use is problematic, and that higher levels of use may not always constitute a less favorable outcome relative to lower levels. For example, certain instances of alcohol use may facilitate increased enjoyment of social situations (Fairbairn & Sayette, 2014) and cannabis is often used for medicinal purposes like chronic pain management (Martín-Sánchez et al., 2009). In other cases, though, substance use can be detrimental and risky – especially when used in large quantities and when multiple substances are used simultaneously, such that the effects overlap (Yurasek et al., 2017). Thus, results in this study should be interpreted with this in mind; one group showing higher levels of weekly use may not necessarily suggest higher risk or a poorer outcome relative to another group. Because of these complex factors, in addition to individual differences like weight and metabolism, there are not universal, clear cutoffs for when substance use is helpful and when it becomes problematic; indeed, in many cases it is likely to be both. Future research could assess for substance use consequences, in addition to quantity and/or frequency, in order to better determine how results can be interpreted and applied.

Additionally, decisions on the categorization of groups were made, in part, due to small sample sizes and reflect my decisions and perceptions of what constitutes a meaningful group. For example, bisexual and pansexual identities are often conceptualized slightly differently by the people who hold them; however, for the sake of this study, it made sense to combine them to increase the sample sizes of people at smaller, more specific intersections (e.g., non-White, Hispanic, bisexual/pansexual cisgender women). Further, this reflected a category of plurisexual identities, or identities that acknowledge the possibility of attraction to multiple genders. One of the ways that identities were categorized in a limiting way was the White and non-White distinction. Ideally, each racial identity, including all distinct multiracial identities would be represented by their own individual category. However, related to both the small LGBTQ+ student sample as well as the predominantly White makeup of the university from which students were recruited, these identities were collapsed into White and non-White in order to have some meaningful intersecting groups with people of color. While this category may be meaningful in the sense that it likely distinguishes between students who have and have not experiences oppression based on racial identity, it certainly does not account for the nuances in forms of oppression that differ based on specific racial identities and combinations thereof. All categorization decisions can be found in Appendix B. Future research with larger samples could apply intersectional analyses using a racial variable that has as many categories as there are different identities, rather than the simplified binary variable used in this study.

Finally, the following questions and curiosities arose during this study, which can be addressed in future research. First, I wonder which other identities might be especially meaningful for mental health outcomes as well as sense of LGBTQ+ community. Due to restrictions on age and geographic location in this sample, these variables were not assessed here.

I also wonder how socioeconomic status may play a role in both outcomes and sense of community. I am curious about what mechanisms, traits, and factors may underlie differences and similarities by intersection of identities. Literature suggests that minority stress and resilience may be worth exploring to begin, but it is certainly possible that there are other variables involved. Lastly, I was left unsure of treatment and intervention recommendations due to small sample sizes and variability in relationships between mental health outcomes and sense of LGBTQ+ community. Future studies Randomized Clinical Trials that juxtapose foci on sense of LGBTQ+ community (e.g., providing all LGBTQ+ clients with standard individual therapy and also providing half with a group intervention focused on developing relationships with other LGBTQ+ community members) and assessed outcomes intersectionally can help both clarify the directionality of relationships between variables and provide a direction for clinical recommendations.

Summary and Conclusions

The results of this study suggested no differences between LGBTQ+ and non-LGBTQ+ students across mental health and substance use outcomes. LGBTQ+ students in general showed no relationship between sense of LGBTQ+ community and relevant outcomes. However, in both cases, when these variables and relationships between variables were compared using intersections of identity, meaningful and interesting relationships emerged. In some cases, findings were consistent with predictions and followed a general trend that more privileged identities were associated with more favorable outcomes; other times, more privileged identities were associated with poorer outcomes. When considering the intersections of four identities at a time, findings were complex and demonstrated the importance of viewing mental health and substance use outcomes through an intersectional lens. In other words, the null findings of the

first two hypotheses were made meaningful by demonstrating how subgroups of participants showed differing outcomes and relationships (i.e., some positive and some negative, combining to give the appearance of null results). Although clear conclusions and specific recommendations cannot be made due to small sample size and the exploratory nature of this research, the findings showcase several important points. First, this emphasizes the value of applying intersectionality, not just theoretically but also practically, to quantitative research. It shows that viewing outcomes and relationships between variables, without considering the differences and similarities that may occur as a result of identity (and identities), can yield uninterpretable and inappropriately monolithic results. This is a research context in which conclusions and recommendations may reference implications for individually administered treatments (e.g., mental health and substance use research findings with recommendations for treatment providers), in which ethical mandates for provision of culturally competent services exist. With this in mind, studies that do not investigate possible variations of findings by identity and intersections of identity may fail to fully meet this mandate. Future research may reference this and other recent studies to determine appropriate intersectional analyses for quantitative work, in order to best meet standards for culturally competent and individually tailored intervention recommendations.

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Appendix A

All measures administered as part of this thesis project.

Demographic Questions

What is your date of birth? (mm/dd/yyyy)
(Used to calculate age at the time survey was completed for age comparison purposes)

How do you define your race?
(Used for reporting of demographic statistics to federal funding agencies)
{Choose all that apply}
□ American Indian or Alaska Native
□ Asian
□ Black of African American
□ Native Hawaiian or Other Pacific Islander
□ White
□ Another _____
□ Do not wish to respond

How do you define your ethnicity?
(Used for reporting of demographic statistics to federal funding agencies)
{Choose one}
□ Hispanic or Latinx
□ Not Hispanic or Latinx
□ Another _____
□ Do not wish to respond

How do you define your sexual orientation/preference?
(We are attempting to better understand relations between sexual orientation/preference and behavior)
Write in: _____

Do you identify as part of the LGBTQ+ Community?
□ Yes
□ No
□ Do not wish to respond

How do you define your Gender Identity?
Note that Cisgender terms Cis Man and Cis Woman denote individuals whose sense of gender identity corresponds with the sex assigned to them at birth.

(We are attempting to better understand relations between gender identity and behavior)
{Choose all that apply}
□ Agender
□ Androgynous
□ Cis man
□ Cis woman
□ Demiboy
□ Demigirl
□ Gender fluid
□ Gender non-binary
□ Gender non-conforming
□ Genderless
□ Genderqueer
□ Man
□ Third gender
□ Trans man
□ Trans woman
□ Transgender
□ Transperson
□ Two Spirit
□ Woman
□ Other _____
□ Choose not to respond

Substance Use Items

Questions will ask about **alcohol** use in a typical week. A typical week is one during the semester when you have your normal class schedule (i.e., no holidays, no midterms, not finals week).

With respect to alcohol consumption, 1 standard drink is equivalent to 12oz beer OR 5oz wine OR 1.5oz shot of liquor straight or in a mixed drink. Please review the image carefully as it will help you understand what exactly counts as a standard drink of alcohol.

How many standard drinks did **you** consume each day during a TYPICAL week in the last 30 days?

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Number of Standard Drinks							

Questions will ask about **marijuana** use in a typical week. A typical week is one during the semester when you have your normal class schedule (i.e., no holidays, no midterms, not finals week).
On which days did **you** consume marijuana during a TYPICAL week in the last 30 days?

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Choose all days when you used marijuana, if none leave blank	☐	☐	☐	☐	☐	☐	☐

Questions will ask about **alcohol and marijuana** co-use in a typical week. A typical week is one during the semester when you have your normal class schedule (i.e., no holidays, no midterms, not finals week).
On which days did **you** consume both alcohol and marijuana during a TYPICAL week in the last 30 days?

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Choose all days when you used both, if none leave blank	☐	☐	☐	☐	☐	☐	☐

Depression, Anxiety, and Stress Scale (DASS-21)

All items were assessed on the following scale:
1 = “Did not apply to me at all”
2 = “Applied to me to some degree, or some of the time”
3 = “Applied to me a considerable degree, or a good part of the time”
4 = “Applied to me very much, or most of the time”

Please read each statement and click the option which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

I found it hard to wind down.
I was aware of dryness of my mouth.
I couldn’t seem to experience any positive feeling at all.
I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).
I found it difficult to work up the initiative to do things.
I tended to over-react to situations.
I experienced trembling (e.g., in the hands).
I felt that I was using a lot of nervous energy.
I was worried about situations in which I might panic and make a fool of myself.
I felt that I had nothing to look forward to.
I found myself getting agitated.
I found it difficult to relax.
I felt down-hearted and blue.
I was intolerant of anything that kept me from getting on with what I was doing.
I felt I was close to panic.
I was unable to become enthusiastic about anything.
I felt I wasn't worth much as a person.
I felt that I was rather touchy.
I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).
I felt scared without any good reason.
I felt that life was meaningless.

Psychological Sense of LGBT Community Scale

All items were assessed on the following scale:
1 = “None”
2 = “A little”
3 = “Some”
4 = “A fair amount”
5 = “A great deal”

How much do you feel able to influence the actions, thoughts, and feelings of other LGBTQ+ people?
How much do you feel other LGBTQ+ people influence your thoughts and actions?
How much do you feel your opinion matters to other LGBTQ+ people?
How much do you feel you can influence what the LGBTQ+ community is like?
How much do you care what LGBTQ+ people think of your actions?
How much do the opinions of other LGBTQ+ people matter to you?
In general, how friendly do LGBTQ+ people feel toward each other?
In general, how thoughtful are LGBTQ+ people toward each other?
In general, how well do LGBTQ+ people get along?
In general, how warm do LGBTQ+ people feel toward each other?
In general, how much of a sense of camaraderie do LGBTQ+ people feel with each other?
How often do you feel that you are a member of the LGBTQ+ community?
How often do you feel like you belong in the LGBTQ+ community?
How often do you feel a part of the LGBTQ+ community?
How much do you feel that you help other LGBTQ+ people when they need help?
How much do you feel that your needs are met by the LGBTQ+ community?
How much do you feel that you can get help from the LGBTQ+ community if you need it?

Appendix B

Description of decisions for categorization of identities in Hypothesis 3.

To begin investigating hypothesis 3, the first step was the creation of broad categories. The following sections detail the decisions made for categorization and for inclusion and exclusion.

Sexual Orientation

Sexual orientation was re-coded into four broad categories. People who identified as lesbians and gay women were assigned to the same category. People who identified as gay men were assigned to another. Both of these categories, to the best of their ability, represented attraction to same-sex, same-gender, and/or same-gender-aligned people.

A third category represented plurisexual identities, indicating attraction to multiple genders. Bisexuality is often defined as attraction to two or more genders, often including same-gender and other-gender attraction. Pansexuality often refers to attraction to people regardless of gender, suggesting capability of experiencing attraction to a person of any gender. The following responses were coded into this category: “bisexual”, “pansexual”, “bi”, “bisexual/pansexual”, “bisexual/queer”, and “queer/pansexual”.

A fourth category represented all other responses that represented a sexual orientation not otherwise represented by the previous three categories. Responses in this category included “I like who I like”, “homoflexible”, “asexual”, “mostly homosexual”, “demipansexual”, “mostly hetero”, “gray-asexual”, and “demisexual”.

Other identities were not included because they did not represent what the researcher considered sexual orientation (e.g., listing gender identities). Responses that were not included are as follows: “vffg”, “female”, and “ciswoman”.

Race

Race was coded into two broad categories. The first category was representative of people who endorsed “White” as their only racial category. All others who endorsed single or multiple racial identities, including one or more marginalized racial identity, were coded into another category, representing multiple ways of being non-White. For some exploratory analyses, this was used as a way of distinguishing between people who have likely experienced racism and those who have not, or those who have experienced no form of racial oppression and those who have experienced some form of racial oppression.

Ethnicity

Ethnicity was coded into two broad categories. The first category was comprised of people who endorsed being Hispanic or Latinx. The other was comprised of people who endorsed being non-Hispanic or Latinx. People who wrote in other ethnicities or responded “Other” were not included.

Gender

Gender was coded into three broad categories. The first category was “Cis Woman”. People who marked “cis woman” or “cis woman and woman” were included in this category. Among people who only marked “woman”, data from the question about sex assigned at birth was referenced to determine if a woman was cisgender. People who marked “woman” as their gender and “female” as their sex assigned at birth were coded as cis women. Similarly, the next category was “Cis Man”. People who marked “cis man” or “cis man and man” were included in this category. Among people who only marked “man”, data from the question about sex assigned at birth was referenced to determine if a man was cisgender. People who marked “man” as their gender and “male” as their sex assigned at birth were coded as cis men.

People who identified as at least one gender identity considered to be a minority identity were coded together in the final category. This included binary trans people (e.g., trans men and trans women) and a variety of identities representing gender non-conformity and non-identification with binary gender. Responses included “cis woman & gendergqueer”, “gender fluid”, “demigirl”, “gender non-binary”, “genderless”, “trans man & transgender”, “androgynous”, “trans woman & woman”, “man, Two-Spirit, & woman”, and “agender”.

Appendix C

Additional tables.

Table 9. Standardized β values for regression of sense of LGBTQ+ community on overall mood concerns for groups of LGBTQ+ students by intersections of four identities.

Group	Standardized β
White, non-Hispanic cisgender gay men	0.125
White, non-Hispanic bi/pan cisgender men	-0.815
White, non-Hispanic cisgender lesbian women	-0.479
White, Hispanic cisgender lesbian women	-0.853
White, non-Hispanic bi/pan cisgender women	-0.142
White, Hispanic bi/pan cisgender women	0.029
non-White, non-Hispanic bi/pan cisgender women	0.466
non-White, Hispanic bi/pan cisgender women	-0.998
White, non-Hispanic cisgender women, other sexual orientation	-0.249
White, non-Hispanic bi/pan gender minorities	0.471

Table 10. Standardized β values for regression of sense of LGBTQ+ community on depression scores for groups of LGBTQ+ students by intersections of four identities.

Group	Standardized β
White, non-Hispanic cisgender gay men	0.386
White, non-Hispanic bi/pan cisgender men	-0.696
White, non-Hispanic cisgender lesbian women	-0.789
White, Hispanic cisgender lesbian women	-0.862
White, non-Hispanic bi/pan cisgender women	-0.131
White, Hispanic bi/pan cisgender women	-0.078
non-White, non-Hispanic bi/pan cisgender women	0.442
non-White, Hispanic bi/pan cisgender women	-0.999
White, non-Hispanic cisgender women, other sexual orientation	0.158
White, non-Hispanic bi/pan gender minorities	0.757

Table 11. Standardized β values for regression of sense of LGBTQ+ community on anxiety scores for groups of LGBTQ+ students by intersections of four identities.

Group	Standardized β
White, non-Hispanic cisgender gay men	-0.369
White, non-Hispanic bi/pan cisgender men	-0.880
White, non-Hispanic cisgender lesbian women	-0.186
White, Hispanic cisgender lesbian women	-0.503
White, non-Hispanic bi/pan cisgender women	-0.082
White, Hispanic bi/pan cisgender women	0.142
non-White, non-Hispanic bi/pan cisgender women	0.288
non-White, Hispanic bi/pan cisgender women	-0.454
White, non-Hispanic cisgender women, other sexual orientation	-0.132
White, non-Hispanic bi/pan gender minorities	-0.089

Table 12. Standardized β values for regression of sense of LGBTQ+ community on stress scores for groups of LGBTQ+ students by intersections of four identities.

Group	Standardized β
White, non-Hispanic cisgender gay men	0.118
White, non-Hispanic bi/pan cisgender men	-0.681
White, non-Hispanic cisgender lesbian women	-0.133
White, Hispanic cisgender lesbian women	-0.870
White, non-Hispanic bi/pan cisgender women	-0.172
White, Hispanic bi/pan cisgender women	0.031
non-White, non-Hispanic bi/pan cisgender women	0.438
non-White, Hispanic bi/pan cisgender women	-0.818
White, non-Hispanic cisgender women, other sexual orientation	-0.708
White, non-Hispanic bi/pan gender minorities	0.529

For an interactive table depicting rate ratios for the relationship between alcohol use and sense of LGBTQ+ community, please access the “alc_bel.html” file included with the thesis document.

For an interactive table depicting rate ratios for the relationship between cannabis use and sense of LGBTQ+ community, please access the “can_bel.html” file included with the thesis document.

For an interactive table depicting rate ratios for the relationship between alcohol and cannabis co-use and sense of LGBTQ+ community, please access the “co_bel.html” file included with the thesis document.