A measure of hypervigilance in LGBTQ identified individuals

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Abstract

Hypervigilance is an individual's heightened awareness to threat or potential threats in their surroundings, may be context specific, and may be associated with negative mental health outcomes. LGBTQ identified individuals may experience hypervigilance related to their stigmatized status. There are few measures of general hypervigilance and no measure of LGBTQ-specific hypervigilance. A sample of LGBTQ identified individuals ($N = 378$) was recruited for an online survey. Using exploratory structural equation modeling, we examined the factor structure of 13 items related to where (locations and contextual conditions) and around whom hypervigilance occurred, and 12 items assessing hypervigilant behaviors. Three factor models were indicated for each set of items. Individuals experienced hypervigilance around strangers, conservative/religious people, and in work settings; they reported hypervigilance as social withdrawal, identity concealment, and scanning behaviors. Individuals who experienced one type of hypervigilant behavior also tended to report other types of hypervigilant behavior. Some group differences by gender identity, sexual identity, and racial/ethnic identity were found; specifically people of color and transgender and nonbinary (TNB) individuals tended to experience more hypervigilance than White and non-TNB individuals, respectively. Expected associations were found between the proposed factors and fear of negative evaluation, depressive and post-traumatic stress symptoms, and satisfaction with life. The suggested factor structure and scales will assist researchers and practitioners in identifying possible LGBTQ-specific hypervigilance and points of intervention.

Keywords: Hypervigilance; LGBT; Measurement; Mental Health; Minority Stress

Public Significance Statement:

This study provides a suggested factor structure and scales to measure LGBT-specific hypervigilance. Individuals experienced hypervigilance around strangers, conservative/religious people, and in work settings; they reported hypervigilance as social withdrawal, identity concealment, and scanning behaviors. These scales highlight areas of concern for researchers and practitioners in assessing hypervigilance and possible impacts on mental health and well-being.

A measure of hypervigilance in LGBTQ identified individuals

Hypervigilance is a heightened awareness or alertness involving enhanced sensitivity to one's surroundings or the immediate environment, including who is present or feared to be present in a location. Hypervigilance has often been studied in specialized or clinical samples and identified as a symptom (or consequence) of post-traumatic stress disorder (PTSD), or severe anxiety or phobias (Kimble et al., 2014). While vigilance, an ordinary amount of awareness, may be adaptive and desirable (Shaw et al., 2010), hypervigilance is often seen as a maladaptive response or associated with trauma-related or extreme anxiety-related stress (Hur et al., 2019).

The term hypervigilance has been used qualitatively to describe experiences of LGBTQ (lesbian, gay, bisexual, transgender, and queer) identified individuals as a reaction to or in anticipation of LGBTQ-related prejudice and stigma (Keating & Muller, 2019; Mink et al., 2014; Timmins et al., 2017). However, the term hypervigilance as used to describe the experiences of LGBTQ identified individuals has yet to be systematically defined or operationalized. Hypervigilance, especially in non-clinical samples of LGBTQ identified individuals, may have impacts on health and well-being that are currently under-researched and under-reported.

Minority stress theory (Brooks, 1981; Meyer, 2003) describes vigilance as a chronic coping strategy or a mechanism used to avoid rejection or victimization (physical attacks) due to stigmatization of sexual or gender identity. When vigilance becomes excessive or beyond ordinary, the state of arousal may be re-labeled as hypervigilance. Hypervigilance, as related to stigma and minority stress in LGBTQ people, may create the risk for negative impacts on health and well-being (Mink, et al., 2014). Minority stress caused by acute discriminatory events (such as being fired from a job because of one's sexual or gender identity) or chronic stigmatization

(such as daily fear of rejection or violence because of one's sexual or gender identity) may lead to trauma-like responses (Keating & Muller, 2019).

While there are measures of other minority stressors for LGBTQ identified individuals (such as outness/disclosure, internalized negativity/stigma, and experiences with prejudice or discrimination), measures of vigilance and especially hypervigilance are lacking. A validated measure of LGBTQ experiences of hypervigilance is needed to fully assess the potential negative health impacts of this heightened alertness. Recent qualitative work suggests that hypervigilance in LGBTQ identified individuals is a complex concept with multiple dimensions. These dimensions include feelings of hypervigilance in public and private spaces and when around family, coworkers, strangers, and others who are perceived to be prejudiced, and behavioral responses such as self-monitoring and social withdrawal (Rostosky et al., 2021). The current study constructed statements reflecting these dimensions to create an LGBT-specific measure of hypervigilance.

Hypervigilance and Threat

Hypervigilance "operates in the presence and absence of threat and involves monitoring for potential dangers via attentional broadening or excessive scanning of the environment" (Richards et al., 2014, p. 1). Hypervigilance has been found to be associated with anxiety where a threat may be present or where threat is unpredictable (contrasted with fear, which is associated with imminent threat; Kastner-Dorn et al., 2018). An active state that may be situational, hypervigilance may be an acute response to the perceived presence of a threat, or it may be a chronic state in response to past trauma. The larger context of acute and chronic hypervigilance includes two primary dimensions of focus: where (location and contextual conditions) and around whom hypervigilance occurs, and what behaviors a hypervigilant person engages in.

Hypervigilance has been distinguished from anxiety, especially trauma-related anxiety and resultant selective attention (Moore & Zirnsak, 2017).

Hypervigilance has primarily been studied as a consequence of PTSD or in relation to a traumatic event (Lissek & van Meurs, 2015) in specific populations. Study of military personnel and war veterans has found hypervigilance to be related to service-related trauma or a consequence of training effects (Kimble et al., 2013). Kimble et al. (2013) found high levels of hypervigilance in veterans returning from war zones, even in the absence of PTSD. Military personnel are trained to scan for threat, and thus may develop a chronic state of hypervigilance linked to place. In this context, hypervigilance has often been measured by eye movement or brain center activation; larger pupil size and visually scanning a broad area are associated with hypervigilance (Kimble et al., 2010).

There are few validated scale measures of hypervigilance for non-combat veterans. Measures of hypervigilance are organized conceptually by context – where and around whom hypervigilance occurs - and the feelings or behaviors associated with hypervigilance. The Brief Hypervigilance Scale (Bernstein et al., 2015) is a five-item measure of general feelings of watchfulness, especially in public spaces. This measure of general feelings of hypervigilance was developed using a sample of college students and correlated significantly with adult betrayal trauma. None of the research studies reviewed above included reports of sexual minority and gender minority subsamples.

Hypervigilance and LGBTQ Samples

The term hypervigilance appears in studies of experiences of minority stress among LGBTQ identified individuals. Traumatic experiences related to discrimination may result in hypervigilance and other symptoms of post-traumatic stress in LGBTQ identified individuals

(Keating & Muller, 2019). For example, in a qualitative study of the victimization (trauma) experiences of sexual and gender minority refugees in the United States and Canada, participants reported "living in a constant state of hypervigilance" in their country of origin because of fear of persecution and violence (Alessi et al., 2017). The hypervigilance reported by the sexual and gender minority participants in the study was a response to past traumas and to constant fear of threats in their country of origin.

Changes in environmental context may lead to increased, or decreased, levels of hypervigilance in LGBTQ identified individuals. Gonzalez and colleagues (2018) found that a sample of LGBTQ identified individuals reported higher levels of vigilance related to their identity and experiences of discrimination after the 2016 U.S. Presidential election. A study of transgender identified and gender diverse people after the election found heightened sense of fear for safety and a hypervigilance about being in public places (Velhuis et al., 2018). In a sample of sexual minority women and gender non-conforming individuals, Drabble and colleagues (2018) found that respondents reported feelings of increased vigilance and evasion after the 2016 U.S. Presidential election and sought out safe places and safe people.

Timmins and colleagues (2017) created a measure of vigilance among transgender individuals. Their measure focused on perceptions of whether other people were "suspicious" of an individual's gender identity (Timmins et al., 2017). The measure did not attempt to identify where or around whom the vigilance occurred. Likewise, the Daily Heterosexist Experiences Questionnaire (DHEQ; Balsam et al., 2013) includes a "vigilance" subscale, which focuses only on concealment and hiding behaviors, not specifically who or where these behaviors occur. These measures of vigilance focusing on identity concealment or disclosure management do not reflect the chronic heightened awareness or alertness that occurs in specific contexts.

A qualitative study focused on exploring hypervigilance in an LGBTQ sample (Rostosky et al., 2021) found that hypervigilance was experienced around family, co-workers, strangers, and people perceived to be prejudiced or anti-LGBTQ (such as conservatives). Participants in the study reported hypervigilance in several locations or settings, such as at work, or in rural areas, bars and restaurants, conservative religious spaces or institutions, and public restrooms. The hypervigilance resulted in negative emotions (such as feelings of stress, anxiety, or exhaustion) and coping behaviors (such as being constantly on guard or engaging in self-monitoring). This study suggests that specific people and locations may be more likely to elicit hypervigilance in LGBTQ identified individuals, resulting in negative emotions that create risk to well-being.

LGBTQ identified individuals are at risk for negative health impacts associated with stigma and minority stress (Balsam et al, 2011; Hatzenbuehler, 2016). Meyer (2003) stated that, as a coping strategy for minority stress, "vigilance is chronic in that it is repeatedly and continually evoked in the everyday life of the minority person" (p. 660-661). Measuring hypervigilance at the level of the individual is important to understanding the impact of stigma and minority stressors on LGBTQ people and addressing risks to their health and well-being (Brooks, 1981; see also Rich et al., 2020). LGBTQ people may experience hypervigilance in certain locations and enact hypervigilance through a specific set of behaviors. While hypervigilance has often been studied in specific populations, study in an LGBTQ population is needed to examine how hypervigilance may contribute uniquely to or exacerbate negative health impacts. The current study aims to suggest a measure of LGBT-specific hypervigilance and provide preliminary validation and evidence of associations between the suggested measure and psychological outcomes.

Method

Procedure and Participants

LGBTQ-identified individuals were recruited for the study through an announcement posted, with permission, to email listservs and social media including Facebook, Twitter, and Instagram groups. The announcement stated, "We are conducting a research study to understand experiences of hypervigilance in the lives of LGBTQ people. By hypervigilance, we mean the experience of paying extra close attention to your surroundings, being wary, watchful, cautious, or guarded." A link to the survey with additional information was provided. Participants accessed the survey online, provided informed consent, and responded to demographic questions, the focal items, and measures of health and well-being. The study procedure and survey were approved by the Institutional Review Board of the University of Kentucky.

Of the 468 participants recruited, 89 were removed for incorrect responses to two attention checks (i.e., "I am checking "Slightly Disagree" to indicate that I am reading carefully." and "Answer "Quite a bit" to indicate that you are reading carefully."); one person was removed because they identified as neither a sexual nor gender minority. The final sample consisted of 378 participants who ranged in age from 18 to 70 years old ($M = 33.49$, $SD = 10.97$), which is an adequate number of participants for measurement analyses (Kline, 2016; Boateng et al, 2018).

Participants could select multiple options to describe their sexual, gender, and racial identities. For gender identity, 50.3% of participants identified as female/woman, 29.0% as male/man, 18.5% as nonbinary, 7.9% as transgender, 6.0% as trans man, 3.2% as trans woman, and 7.1% identified as having another gender identity. For sexual identity, participants identified as Gay (31.7%), Lesbian (28.8%), Queer (30.1%), Bisexual (22.7%), and Pansexual (13.5%). Participants identified as White (83.6%), multi-racial (7.7%), Latinx (3.1%), Asian (2.1%), and Black (1.8%), Native American (.2%), Middle Eastern (.5%), or an unlisted racial identity (.2%).

Participants reported residence in 45 different states. They indicated earning an advanced college degree (40.9%), a college degree (23.2%), having some college (20.3%) or some advanced degree work (12.1%), or a high school diploma or GED (3.2%).

Measures

LGBTQ-Hypervigilance Scale Item Statements

We followed steps recommended by Boateng et al. (2018) for scale construction and planned analyses. Item statements were created based on qualitative data provided by Rostosky et al. (2021). The qualitative data were read for common statements associated with the themes of where (in what locations or settings) and around whom hypervigilance occurred and the specific hypervigilant behaviors participants reported. An initial set of 22 items for who and where and 20 items describing hypervigilant behaviors were drafted. The items were constructed as statements and piloted for language, comprehension, and inclusiveness of themes with 12 LGBTQ identified individuals and experts in LGBTQ research (including members of the research lab of the senior authors and LGBTQ identified individuals in the social networks of the authors who were not familiar with the purpose of the research). Item statements were refined to combine statements considered close in meaning, to eliminate duplicate items, and to revise item wording for clarity.

The final item set of statements included six statements about persons or groups associated with hypervigilance and seven statements of locations or settings, reflecting the dimension of where and around whom LGBTQ-identified people experience hypervigilance. And additional 12 items specified hypervigilant behaviors (see Table 1 for item statements). Participants responded to each item indicating how well the statement described their feelings on

a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Analyses and factors are described in the Results section.

Fear of Negative Evaluation

Feelings of fear or worry about negative evaluation by others were assessed with the Brief Fear of Negative Evaluation-II scale (BFNE; Carleton et al., 2007). The BFNE asks participants to rate their level of agreement with each of 12 statements (for example, "I am afraid that others will not approve of me") on a Likert scale, ranging from 1 (*not at all characteristic of me*) to 5 (*entirely characteristic of me*). Responses were averaged with a higher score indicating greater fear of negative evaluation by others. The BFNE-II has demonstrated excellent convergent validity, discriminant validity, and internal consistency (Carleton et al., 2007), and has been used with lesbian, gay, and bisexual samples (see Feinstein et al., 2012).

Depressive Symptoms

The Center for Epidemiological Studies Depression Scale (CES-D-10; Radloff, 1977) was used to assess the frequency of depressive symptoms (for example, "I felt depressed" and "I felt that everything I did was an effort"). Participants rated each of the 10 item statements on a Likert scale, ranging from 0 (*rarely or none of the time*) to 4 (*most or all of the time*), with a higher overall score indicating more frequent symptoms of depression. Responses were averaged such that higher scores indicate higher levels of depressive symptoms. The CES-D has demonstrated good convergent and discriminant validity (Radloff, 1977).

Post-traumatic Stress

Symptoms of post-traumatic stress were assessed with the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 consists of 20 symptoms including "repeated, disturbing dreams of the stressful experience". Participants rated how much they were bothered

by each symptom in the past month on a Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Responses were averaged to create a symptom score with higher scores indicating the presence of more post-traumatic stress. The PCL-5 has demonstrated strong internal consistency, test-retest reliability, and discriminant and convergent validity (Blevins et al., 2015).

Satisfaction with Life

Overall life satisfaction was assessed with the Satisfaction with Life Scale (SWLS; Diener et al., 1985). Participants rated each of the five items (for example, "In most ways, my life is close to my ideal") on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with a higher score indicating greater life satisfaction. The SWLS has demonstrated good convergent and discriminant validity (Pavot & Diener, 1993) and has been used with samples of sexual minorities (Strübel & Petrie, 2019).

Analysis Plan

Factor Analyses

We assessed the factor structure of feelings of hypervigilance in different settings and around different people and, separately, hypervigilant behaviors using exploratory structural equation modeling (ESEM) in M*plus* version 8.3 (Muthén & Muthén, 2017). ESEM is an M*plus* module that combines features of exploratory and confirmatory factor analysis by estimating primary and secondary factor loadings for each item included in the analysis and provides estimates of model fit (Brown, 2015; Muthén & Muthén, 2017).

For each set of analyses, we used full information maximum likelihood estimation (FIML) with robust standard errors (MLR estimation) to adjust for missing values and small amounts of skew and kurtosis, which are common in survey data (Brown, 2015). We followed recommendations by Hu and Bentler (1999) when evaluating model fit. We considered values of

the comparative fit index (CFI) and Tucker Lewis Index (TLI) greater than .90 and .95 as indicating evidence of adequate and excellent fit, respectively. Similarly, values of the root mean square error of approximation (RMSEA) of .08 and .06 were indices of adequate and excellent fit. We also examined the standardized root mean residual (SRMR); values less than .08 were considered evidence of excellent fit (Asparouhov & Muthén, 2018). Decisions about the number of factors to extract were guided by findings from Rostosky et al. (2021) and comparisons of nested models using estimates of relative model fit. Following Chen (2007), we considered decreases in the CFI of .01 or increases in the RMSEA of .015 to indicate significant degradations in model fit when comparing nested models.

Reliability

We computed Cronbach's alpha (α) as a measure of scale reliability. We also examined whether removing items would increase scale reliability and noted places where we made adjustments to the scales identified in the factor analyses below.

Construct Validity

We averaged across items to create composite measures for each scale identified in the factor analyses. We explored group differences in measures of hypervigilance as a function of sexual and gender identity. We also examined the associations of hypervigilance to measures of post-traumatic stress and depression symptoms, satisfaction with life, and brief fear of negative evaluation.

Results

Factor Structure

Where and Around Whom

We first examined feelings of hypervigilance in different settings and among strangers (see Table 1 for items). We examined one-, two-, and three-factor models of the 13 items assessing where and around whom participants felt hypervigilant. Fit was poor for the one-factor model, χ^2 (65) = 963.47, p < .001, CFI = .67, TLI = .61, RMSEA = .19, 90% CI[.18, .20], SRMR = .11, and two-factor model, χ^2 (53) = 508.80, CFI = .83, TLI = .76, RMSEA = .15, 90%CI [.14 - .16], SRMR = .07, ΔCFI = .16, ΔRMSEA = -.04. Fit for the three-factor model was acceptable, χ^2 (42) = 140.52, p < .001, CFI = .96, TLI = .93, RMSEA = .08, 90% CI[.07, .09], SRMR = .03, and significantly better than the two-factor model, ΔCFI = .13, ΔRMSEA = -.07. The three-factor model reflected hypervigilance around strangers (Strangers); around conservative and religious individuals and in religious settings (Conservatives/Religious); and in the workplace and around co-workers (Work).

We then correlated the errors between items assessing hypervigilance around conservative and religious people and in religious spaces to account for effect due to similar wording (Brown, 2015). The resulting final measurement model exhibited good fit, χ^2 (41) = 121.79, p < .001, CFI = .98, TLI = .96, RMSEA = .07, 90% CI[.06, .09], SRMR = .02 (see Table 1 for standardized factor loadings). Correlations among the three factors ranged from .35 - .51, indicating that individuals who felt hypervigilant in one setting also tended to feel hypervigilant in other settings. However, correlations among factors were low enough to suggest that they measure different aspects of hypervigilance.

Hypervigilant Behaviors

We then separately examined the factor structure of the 12 items assessing hypervigilant behaviors using the same procedures described above (see Table 1). The one-factor model, χ^2 (54) = 660.14, CFI = .66, TLI = .59, RMSEA = .17, 90%CI [.16, .18], SRMR = .12, and two-

factor model, χ^2 (43) = 208.90, $p < .001$, CFI = .91, TLI = .86, RMSEA = .10, 90%CI [.09, .12],

SRMR = .06, ΔCFI = .25, ΔRMSEA = -.07, indicated evidence of poor fit. The three-factor

model, χ^2 (33) = 81.49, $p < .001$, CFI = .97, TLI = .95, RMSEA = .06, 90%CI [.04, .08], SRMR

= .02, exhibited excellent fit, and fit significantly better than did the two-factor model, ΔCFI =

.06, ΔRMSEA = -.03. The three-factor model reflected factors indicating social withdrawal,

identity concealment, and scanning behaviors. Correlations among factors ranged from .23-.48,

suggesting that participants who experienced one type of hypervigilant behavior also tended to

experience other types of hypervigilant behavior. However, correlations among factors were

sufficiently low to suggest distinctions among them.

Reliability

Where and Around Whom

We examined estimates of internal consistently (Cronbach's alpha) for each scale. The

analyses suggested estimates of reliability would improve for the Work and

Conservatives/Religious scales if we removed the items "I feel hypervigilant (pay extra

attention) when I am around straight men" from the Conservatives/Religious scale and the item

"I feel hypervigilant (pay extra attention) when I am in healthcare settings," which failed to load

strongly on any factor. These statements were removed from the proposed scales in further

analysis. Cronbach's alpha was .89 for Strangers and .84 for Conservative/Religious. The inter-

item correlation for Work was $r = .81$. Table 1 indicates the final items used in each scale.

Hypervigilant Behaviors

Reliability analyses did not suggest the need to remove any items from the measure of

hypervigilant behaviors. Estimates of Cronbach's alpha were .68 for Identity Concealment, .80

for Social withdrawal, and .87 for Scanning.

Construct Validity

Means and Associations among Measures

Means, standard deviations, and associations among focal measures are reported in Table 2. Hypervigilance were highest on the Conservatives/Religious scale, followed by Strangers, and Work. The most commonly endorsed hypervigilant behavior was scanning, followed by identity concealment and social withdrawal. Endorsements of depressive and post-traumatic stress symptoms were generally low, and participants indicated experiencing some fear of negative evaluation. Endorsements of satisfaction with life were above the midpoint of the scale, indicating participants were generally more (vs. less) satisfied with life.

Associations among measures indicated that participants who experienced more hypervigilance in one area tended to experience more hypervigilance in other areas as well. The people and settings where individuals experienced hypervigilance were also associated with hypervigilant behaviors. Hypervigilance scores on Strangers, in Conservatives/Religious, and Work scales were associated with more Scanning, Social withdrawal, and Identity Concealment. Associations of higher levels of hypervigilance when among strangers was strongest with more scanning and social withdrawal behaviors.

Individuals who experienced more hypervigilance around Strangers, Conservatives/Religious, and Work reported greater fear of negative evaluation, more depressive and post-traumatic stress symptoms, and less satisfaction with life. The associations between hypervigilant behaviors and psychological health outcomes differed across factors. Social withdrawal was strongly associated with more depressive and post-traumatic stress symptoms, less satisfaction with life, and greater fear of negative evaluation. Scanning behaviors were strongly associated with greater post-traumatic stress symptoms. Scanning and Identity

Concealment were significantly associated with all four of the psychological outcomes, although the associations were weaker.

Mean Differences by Sexual and Gender Identity

We next examined mean differences in focal measures as a function of sexual orientation (Table 3) and gender identity (Table 4). Generally, gay and lesbian participants exhibited similar endorsements of hypervigilance and similarly positive psychological outcomes. Two mean differences emerged; gay individuals reported greater Identity Concealment and hypervigilance on the Conservatives/Religious scale than did lesbian individuals. Comparisons of lesbian- and gay-identified versus bi- and pan-sexual identified individuals suggested that gay, lesbian, bisexual and pansexual individuals reported similar levels of hypervigilance on Strangers, Conservatives/Religious, and Work scales. Gay and lesbian individuals reported more Social Withdrawal than did bisexual and pansexual individuals. However, as compared to bisexual and pansexual individuals, gay and lesbian individuals reported less fear of negative evaluations, greater satisfaction with life, and fewer depressive and post-traumatic stress symptoms.

We assessed mean differences in focal measures as a function of gender identity by first examining differences in responding among all individuals who identified as either male/man or female/woman, regardless of whether they also identified as transgender, nonbinary, or having another gender identity. Few gender differences emerged; as compared to men, women reported more hypervigilance on the Conservatives/Religious scale, more Identity Concealment, and marginally more depressive symptoms.

We then examined whether the responses of individuals who identified as transgender and nonbinary (TNB) were different from individuals who identified as men or women and not also as transgender and/or nonbinary. TNB individuals reported more hypervigilance across all

factors than did non-TNB individuals. They also reported significantly lower scores on each of the four psychological outcomes

Mean Differences by Race

Finally, we examined whether mean differences in focal measures emerged as a function of participant race. Because of low numbers of people who did not identify as White in this sample, people of color were combined for analysis. People of color ($n = 61$; $M = 5.83$) indicated marginally less hypervigilance on the Conservatives/Religious scale than White people ($n = 317$; $M = 6.12$), $F(1, 376) = 3.34$, $p = .069$. However, people of color ($n = 61$; $M = 4.89$) reported significantly greater feelings of hypervigilance at work than White people ($n = 316$; $M = 4.42$), $F(1, 375) = 3.92$, $p = .048$. People of color ($n = 61$; $M = 4.40$) also reported marginally more Social withdrawal behaviors than White people ($n = 317$; $M = 4.09$), $F(1, 376) = 2.78$, $p = .097$. White people and people of color exhibited similar levels of hypervigilance on all other measures.

Psychological health outcomes

We regressed each psychological health outcome separately on all domains of hypervigilance (see Table 5). The inclusion of contrasts coding sexual and gender identities did not alter conclusions nor the effects described below. We proceeded with the more parsimonious model.

Social withdrawal was uniquely and strongly associated with poorer psychological health outcomes (i.e., less satisfaction with life, more depressive and post-traumatic stress symptoms, and greater BFNE). In the full model, those who reported more hypervigilance around strangers experienced less depression and post-traumatic stress, although this appears to be a suppressive effect as zero-order correlations indicate that a higher Strangers score is associated with

reporting higher levels of depressive and post-traumatic stress symptoms. Scanning behaviors were only associated with greater post-traumatic stress. In addition, those who experienced greater hypervigilance on the Conservatives/Religious scale reported higher levels of depressive and post-traumatic stress symptoms. Hypervigilance at work was associated with less satisfaction with life.

Discussion

The term hypervigilance has been used in past studies of LGBTQ identified individuals; however, more attention is needed to define and operationalize the term as it applies specifically to LGBTQ identified individuals. The current study suggests a factor structure and measure of hypervigilance in LGBTQ identified individuals consistent with previous qualitative findings (Rostosky et al., 2021) and the conceptual dimensions of studies of hypervigilance in non-LGBTQ samples. The findings of the present study expand our understanding of the domains of hypervigilance experienced by LGBTQ identified individuals and their relative associations with psychological health outcomes.

Research on hypervigilance in other areas, such as veterans returning from war (Kimble et al., 2010), suggest there may be domain or group specific experiences. Given that LGBTQ identified individuals as a group have shared experiences of stigmatization, prejudice and discrimination, and threat related to their sexual and gender identities, commonalities in their experiences of hypervigilance may be expected. Hypervigilance may be an adaptive and even necessary behavior in a context of the continued stigmatization of LGBTQ people. The present research study aimed to identify and define factors of hypervigilance, an important step to assisting researchers and mental health practitioners in measuring and assessing the prevalence

and risk of hypervigilance at the individual level and in specific LGBTQ groups that may be at higher risk.

Experiencing hypervigilance around different groups of people may be a response to experiences with or anticipating threats to personal safety, or experiences with or anticipating rejection in interpersonal interactions. Scanning for threats is an associated behavior when around different groups of people. Transgender individuals, for example, reported a wariness or feeling watchful and trying to figure out how others around them were reacting to them (Timmins et al, 2017); in the current sample we find that TNB participants reported higher levels of scanning or being on alert for possible rejection or threat to their safety than non-TNB participants.

Concepts and measures of social rejection or experiences of discrimination do not fully capture the heightened awareness or scanning for threats that characterize hypervigilance. For example, anticipation or fear of social rejection, where social rejection is defined as "an explicit declaration that an individual or group is not wanted," (p. 427, Williams, 2007) does not include the feelings or behaviors associated with heightened awareness or scanning the environment. Understanding hypervigilance is important to a more nuanced understanding of the impact of stigma and minority stressors on LGBTQ individuals and measuring hypervigilance is important to research in this area.

LGBTQ individuals reported hypervigilance around people perceived to be "religious" and when in religious settings. Even individuals who are not religious are likely to have contact with people who are religious, have contact with religious institutions, or be exposed (through media) to religious-based prejudice. Although there are accepting and welcoming religious people and institutions, and a majority of LGBTQ identified individuals report identifying as

spiritual, past experiences of religious-based stigmatization and prejudice may lead many LGBTQ identified individuals to assume that religious people and institutions will reject them (see Barringer, 2020). This may cause them to be extra watchful when they encounter people perceived to be religious or when in a religious setting (a church or mosque; Lefevor et al., 2020).

LGBTQ identified individuals also reported hypervigilance in the workplace and around co-workers. Experiences of discrimination and prejudice are common in the workplace, ranging from microaggressions to discrimination, bullying, and violence (Douglass et al., 2017; Mizock et al., 2018; Pichler & Ruggs, 2018; Rivera et al., 2013). While some workplaces have non-discrimination policies that include sexual orientation and gender identity/expression, not all do. Even in workplaces with supportive policies and environments, individuals may encounter or fear they may encounter discrimination, resulting in hypervigilance. Depending on their specific work context, LGBTQ individuals may experience hypervigilance around co-workers, supervisors, employees, clients or customers.

Disclosure and concealment are linked to hypervigilance, consistent with other measures of "vigilance" that focus on who may know or suspect an LGBTQ individual's sexual or gender identity (Balsam et al, 2011; Timmins et al., 2017). Disclosing sexual or gender identity puts an individual at risk for discrimination, and LGBTQ identified individuals report monitoring others' reactions to disclosure of their sexual and/or gender identities (Solomon et al., 2015). Changes in managing and monitoring visibility may result from hypervigilance in some settings (Dewaele et al., 2013). Social withdrawal is a coping behavior linked to hypervigilance and is an attempt to remove oneself from a place where harm might occur. For example, during public debates over marriage restrictions and equality, LGBTQ identified individuals reported withdrawing from

other people or avoiding certain places in order to decrease their risk of experiencing prejudice

or violence (Ecker et al., 2019; Rostosky et al., 2010). Social withdrawal when not accompanied

by seeking support increases risk for negative health outcomes and social isolation, which the

present study supports.

<div align="center">**Limitations and Future Research**</div>

The reported research is based on a convenience sample; samples with different

demographics may yield additional factors indicating hypervigilance. Individuals with multiple

minority/minoritized/stigmatized identities may experience hypervigilance differently. For

example, Black or Latinx LGBTQ individuals may be more hypervigilant in interactions with the

police or government agency personnel (ICE), or race and gender may interact to produce

different experiences in different settings (neighborhoods; Lampe et al., 2020). For example,

Riggle et al. (2021) discovered differences among the experiences of Black, Latinx, and White

sexual minority women in their interactions with other people following the 2016 U.S.

Presidential election. Future study with more diverse samples will need to validate the suggested

measure and possibly expand upon it.

The scanning scale has a low Cronbach's alpha; the scale is only three items which may

contribute to the lower internal consistency. Future research may explore and add items to this

scale. Measurement invariance for all statements across groups should also be explored in future

samples. For example, the item statement about hypervigilance in public restrooms has a lower

loading than the other item statements in the Strangers scale. This may be because some

LGBTQ identified individuals "pass" more than others and are less likely to experience

harassment in public restrooms, while others are more hypervigilant in public restrooms (Riggle,

2018). Future research could explore how this item contributes to the scale for some people but not others.

Although we assessed different dimensions of hypervigilance, associations among measures suggest the presence of a global hypervigilance factor. Future work might assess bifactor models of the measures of hypervigilance (Boateng et al., 2018; Rodriguez et al., 2016) to indicate the presence of a global factor and the potential independent effects of each subdimension. In addition, while the current suggested scales may help researchers and practitioners to identify common situations and behaviors that constitute hypervigilance, , complementary methods such as daily diary studies may be useful for exploring daily hypervigilance and its impacts (see Potter et al., 2019, for a review of studies of discrimination).

The factors of hypervigilance related to sexual and gender identity-based minority stress suggested in the current study were associated with health and well-being outcomes, and distinct from a measure of post-traumatic stress and general fears of negative evaluations. The factors need to be assessed in comparison to the few general measures of hypervigilance available (Bernstein et al., 2015) and measures of LGBTQ vigilance (the vigilance subscale in Balsam et al., 2011). Studies comparing responses to these measures will further determine the added assessment value of the current measure, especially beyond the disclosure/concealment focus emphasized in previous measures.

Scanning the environment for possible threats may help an individual avoid experiences of prejudice; however constant or chronic scanning in response to stigma may also exhaust an individual mentally, physically, and emotionally. Constant scanning involves a hyper-arousal that may be linked to negative health outcomes. Identifying specific factors that indicate hypervigilance may help researchers and practitioners focus interventions to support health and

well-being in LGBTQ people. Increasing feelings of safety and awareness of   hypervigilant

behaviors and their impact on well-being may support better health. While there may be other

areas of hypervigilance for certain individuals, knowledge of common areas of concern is helpful

as a beginning point assessment, and ultimately, intervention.

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Table 1

LGBTQ-Hypervigilance Scale Item Statements and Factor Loadings

Item	Strangers	Conservatives /Religious	Work	Identity Concealment	Social withdrawal	Scanning
I feel hypervigilant (pay extra attention) when I am around strangers.	**.68**	.14	.01	--	--	--
I feel hypervigilant (pay extra attention) when I am around crowds of people.	**.73**	.12	-.04	--	--	--
I feel hypervigilant (pay extra attention) when I am in new places I have not been to before.	**.88**	.01	-.05	--	--	--
I feel hypervigilant (pay extra attention) when I am in public restrooms.	**.58**	-.05	.11	--	--	--
I feel hypervigilant (pay extra attention) when I am in bars or event spaces.	**.80**	-.06	.03	--	--	--
I feel hypervigilant (pay extra attention) when I am in unfamiliar places.	**.83**	.01	.00	--	--	--
I feel hypervigilant (pay extra attention) when I am around people I think are conservative.	-.06	**.96**	-.02	--	--	--
I feel hypervigilant (pay extra attention) when I am around people I think are religious	.00	**.82**	.02	--	--	--
I feel hypervigilant (pay extra attention) when I am in religious spaces.	.04	**.45**	.21	--	--	--
I feel hypervigilant (pay extra attention) when I am around straight men.	.25	.36	.13	--	--	--
I feel hypervigilant (pay extra attention) when I am around coworkers.	-.06	.00	**.92**	--	--	--
I feel hypervigilant (pay extra attention) when I am at work.	.02	.01	**.89**	--	--	--
I feel hypervigilant (pay extra attention) when I am in health care settings.	.27	.18	.25			
I monitor my actions to conceal my identity or appear more acceptable to others.	--	--	--	**.76**	.06	-.02
I avoid public displays of affection (PDA).	--	--	--	**.47**	-.03	.02
I alter my presentation to conceal my identity or appear more acceptable to others.	--	--	--	**.71**	-.01	.02
I try not to make eye contact with other people.	--	--	--	.10	**.62**	-.01
I am self-conscious around others.	--	--	--	.09	**.62**	.00
I stay home instead of going out in public in order to avoid prejudice.	--	--	--	.11	**.66**	.03
I sometimes withdraw socially.	--	--	--	-.01	**.71**	-.06
I often anticipate negative reactions to my presence.	--	--	--	-.04	**.58**	.18
I always try to have a safety plan when going out in public.	--	--	--	.01	.27	**.54**
I am aware of my surroundings at all times.	--	--	--	.04	.01	**.68**

I look around to see if I am safe.	--	--	--	-.01	.05	**.85**
I scan the area I am in for potential threats.	--	---	--	-.01	-.03	**.96**

Note. $N = 378$. All loadings are standardized loadings. Bolded loading coefficients indicate the statements included in the final scales.

Table 2

Means and Associations among Hypervigilance and Psychological Measures in LGBTQ individuals

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
Hypervigilance											
1. Strangers	5.29	1.25									
2. Conservatives/Religious	6.08	1.18	.45***								
3. Work	4.50	1.71	.41***	.35***							
4. Identity Concealment	4.25	1.51	.19***	.26***	.33***						
5. Social withdrawal	4.14	1.33	.56***	.32***	.41***	.39***					
6. Scanning	5.04	1.33	.61***	.35***	.34***	.23***	.50***				
Psychological Outcomes											
7. SWLS	4.23	1.42	-.22***	-.10	-.25***	-.21***	-.45***	-.15**			
8. Depression	2.25	0.64	.25***	.21***	.24***	.22***	.57***	.30***	-.55***		
9. PCL-5	2.48	0.94	.33***	.22***	.31***	.30***	.67***	.46***	-.46***	.72***	
10. BNFE	3.36	1.04	.24***	.27***	.18***	.38***	.47***	.18***	-.20***	.34***	.41***

Note. N = 356 – 378. *** *p* < .001. ** *p* < .01. * *p* < .05. † *p* < .07

SWLS = Satisfaction with Life Scale (Diener, Emmnos, Larsen, & Griffin, 1985); Depression = Center for Epidemiological Studies Depression

Scale (CES-D-10; Radloff, 1977); PCL-5 = PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013); BNFE = Brief Fear of Negative

Evaluation-II scale (Carleton et al., 2007).

Table 3

Mean Differences in Hypervigilance and Psychological Measures as a Function of Sexual Identity

Variable	Gay Individuals (n = 93-100)		Lesbian Individuals (n = 81-85)				Bisexual and pansexual individuals (n = 81-85)		Gay and Lesbian individuals (n = 179-191)			
	M	SD	M	SD	F	η^2	M	SD	M	SD	F	η^2
Hypervigilance												
Strangers	5.22	1.23	5.15	1.30	0.15	.00	5.32	1.28	5.19	1.26	0.67	.00
Conservatives/religious	5.77	1.42	6.22	1.09	5.94*	.03	5.96	1.21	5.98	1.29	0.03	.00
Work	4.33	1.77	4.43	1.77	0.16	.00	4.56	1.72	4.37	1.77	0.70	.00
Identity Concealment	4.46	1.47	4.00	1.60	4.23*	.02	4.17	1.45	4.24	1.54	0.11	.00
Social withdrawal	4.01	1.35	3.96	1.29	0.08	.00	3.33	1.34	3.98	1.32	3.98*	.01
Scanning	4.88	1.40	4.94	1.36	0.09	.00	5.07	1.34	4.91	1.38	0.87	.00
Psychological Outcomes												
SWLS	4.20	1.41	4.49	1.36	1.98	.01	3.82	1.43	4.34	1.39	7.82**	.03
Depression	2.09	0.62	2.26	0.68	2.90†	.02	2.36	0.65	2.17	0.65	4.78*	.02
PCL-5	2.32	0.85	2.34	0.92	0.02	.00	2.70	1.03	2.33	0.88	9.12**	.03
BNFE	3.20	1.02	3.32	1.09	0.60	.00	3.51	1.11	3.26	1.05	3.07†	.01

Note. *** $p < .001$. ** $p < .01$. * $p < .05$. † $p < .10$.

SWLS = Satisfaction with Life Scale (Diener, Emmnos, Larsen, & Griffin, 1985); Depression = Center for Epidemiological Studies Depression Scale (CES-D-10; Radloff, 1977); PCL-5 = PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013); BNFE = Brief Fear of Negative Evaluation-II scale (Carleton et al., 2007).

Table 4

Mean Differences in Hypervigilance and Psychological Measures as a Function of Gender Identity

Variable	Men (n = 102-109)		Women (n = 181-191)				TNB (n = 102-107)		Male/Female (non-TNB) (n = 252-270)			
	M	*SD*	*M*	*SD*	*F*	η^2	*M*	*SD*	*M*	*SD*	*F*	η^2
Who and Where												
Strangers	5.20	1.28	5.09	1.27	0.52	.00	5.78	1.16	5.10	1.23	23.62***	.06
Conservatives/Religious	5.77	1.44	6.18	1.05	8.24**	.03	6.38	0.92	5.96	1.26	9.68**	.03
Work	4.29	1.77	4.37	1.76	0.16	.00	5.06	1.42	4.29	1.77	16.24***	.04
Hypervigilant Behaviors												
Identity Concealment	4.51	1.50	4.13	1.52	4.24*	.01	4.47	1.50	4.18	1.50	2.73†	.01
Social withdrawal	3.89	1.30	4.02	1.30	0.66	.00	4.78	1.30	3.89	1.26	37.94***	.09
Scanning	4.81	1.48	4.98	1.27	1.07	.00	5.44	1.10	4.89	1.37	13.77***	.04
Psychological Outcomes												
SWLS	4.23	1.45	4.45	1.36	1.67	.01	3.74	1.39	4.43	1.39	17.90***	.05
Depression	2.09	0.59	2.24	0.64	3.52†	.01	2.48	0.60	2.14	0.62	21.44***	.06
PCL-5	2.30	0.82	2.42	0.91	1.08	.00	2.87	0.96	2.32	0.88	27.54***	.07
BNFE	3.26	1.02	3.44	1.07	1.98	.01	3.50	0.98	3.30	1.06	2.79†	.01

Note. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. The categories "men" and "women" include all individuals who identified as men or women,

including those who also identified as transgender and/or nonbinary. TNB = Transgender and Nonbinary identified individuals.

SWLS = Satisfaction with Life Scale (Diener, Emmnos, Larsen, & Griffin, 1985); Depression = Center for Epidemiological Studies Depression

Scale (CES-D-10; Radloff, 1977); PCL-5 = PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013); BNFE = Brief Fear of Negative

Evaluation-II scale (Carleton et al., 2007).

Table 5

Associations Between Hypervigilance and Psychological Outcomes

Variable	SWLS				Depression				PCL-5				BFNE			
	b	*SE*	*F*	η^2	*b*	*SE*	*F*	η^2	*b*	*SE*	*F*	η^2	*b*	*SE*	*F*	η^2
Who/Where																
Strangers	0.00	0.08	0.00	.00	-0.09	0.03	8.34**	.02	-0.15***	0.04	13.92***	.04	-0.01	.05	0.03	.00
Conservatives/ Religious	0.08	0.07	1.61	.00	0.03	0.03	1.08	.00	-0.01	0.03	0.06	.00	0.12	.05	6.91**	.02
Work	-0.08	0.05	3.13†	.01	0.01	0.02	0.37	.00	0.02	0.02	1.00	.01	-0.04	.03	1.95	.01
Hypervigilant Behaviors																
Identity Concealment	-0.05	0.05	0.86	.00	-0.01	0.02	0.09	.00	0.02	0.03	0.48	.00	0.16	.03	21.46***	.06
Social withdrawal	-0.49	0.07	55.51***	.14	0.29	0.03	108.21***	.24	0.44	0.04	154.31***	.30	0.33	.05	51.63***	.13
Scanning	0.11	0.06	2.67	.01	0.04	0.03	2.51	.01	0.18	0.03	27.62***	.07	-0.08	.04	2.90†	.01

Note. N = 355-362. ***p < .001. **p < .01. *p < .05. †p < .10. All estimates are unstandardized.

SWLS = Satisfaction with Life Scale (Diener, Emmnos, Larsen, & Griffin, 1985); Depression = Center for Epidemiological Studies Depression Scale (CES-D-10; Radloff, 1977); PCL-5 = PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013); BNFE = Brief Fear of Negative Evaluation-II scale (Carleton et al., 2007).