



**Exploring The Intersection Between Neurodivergence and SGM Population: Literature Review**

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**ABSTRACT**

The purpose of this article is to review the current literature on the intersectionality of neurodivergence and gender and sexual minority population and their mental health. Although there is growing interest in all these topics individually, there is a very limited understanding of how they interact with each other. The article primarily is focused on; neurodivergence, mental health, LGBTQ+, and executive function studies. The finding reflected that

discrimination, prejudice, and stigmatisation act as major barriers for these populations to access essential resources, support systems, and opportunities. The review stresses the need for more inclusive approaches in both research and practice to promote well-being as there is a significant gap in comprehending how these two aspects of an individual interact and create affirming and supportive environments for the neuroqueer community.

**Keywords:** *LGBTQ+, Neurodivergence, Mental Health, Executive Function, Discrimination.*

### Introduction

Minority stress theory emphasises that minority groups experience stress as a result of stigma and discrimination, which in turn puts them at a higher risk of being predisposed to a number of negative physical and mental health issues (McConnell et al., 2019). Minority stress theory is based on the hypothesis that sexual and gender minority, health disparities are produced by excess exposure to social stress faced by sexual and gender minority populations due to their stigmatised social status (Frost & Meyer, 2023).

Neurodiversity refers to variation in neurocognitive functioning. It is an umbrella term that incorporates neurocognitive disorders such as autism, attention deficit hyperactivity disorder (ADHD), dyslexia, Tourette's syndrome, anxiety, obsessive-compulsive disorder, depression, intellectual disability, and schizophrenia. Neurodivergent individuals are those whose brain functions differ from those who are neurologically typical, or neurotypical (Hughes, 2016)

'LGBTQ+' is an umbrella acronym that refers to lesbian, gay, bisexual, transgender, queer, and other sexual and gender minority identities. (Legler et al., 2022). There is a significant amount of literature indicating that there is a higher prevalence of depression, anxiety,

substance use disorders, and even suicide amongst LGBTQ+ community, particularly among younger population (Haas et al., 2011).

Historically we have seen that LGBTQ+ individuals, as well as individuals who identify as neurodivergent, have faced many challenges in freely engaging in social and recreation activities (Lhant, 2022). They are frequently excluded or made to feel uncomfortable and unsafe in outdoor spaces, facing bias and prejudice in decision-making and policies regarding access to public lands and resources. Furthermore, some LGBTQ+ individuals feel they have not been represented in outdoor culture, despite the community having been involved in outdoor recreation for decades (Winters, 2020).

According to research, the intersectionality of neurodivergent patients with racial minority status, sexual minority status, female gender identity, lower levels of education, and lower socioeconomic status has been linked to higher rates of suicide (Beauchaine et al., 2020; Lund, 2021; Segers & Rawana, 2014; Strang et al., 2021). These correlations suggest that the intersection of neurodivergence and membership in other marginalised groups are particularly likely to produce higher levels of minority stress due to exposure to socially driven stressors such as harassment, discrimination, and prejudice (Lund, 2021) as well as internalised stigma and expectations of rejection (Meyer, 2003).

### **Intersectionality of neurodivergence and LGBTQ+ community**

“Neuroqueer,” a term coined by Nick Walker (2015) describes the intersectionality of being both neurodivergent and queer. “Neuroqueering ” refers to the incorporating and expressing of one’s neurodivergence in ways that also represents their queerness which includes their

expression of gender, sexuality, ethnicity, and/or other aspects of one's identity (Walker, 2021). LGBTQ+ population has always had difficulty in engaging and expressing themselves in recreational and outdoor settings due to the persistent discrimination they face. Studies show that discrimination can have significant impact on the physical, emotional, and mental well-being of impacted individuals, creating barriers to the path of health care benefits of recreation and physical activity (George & Stokes 2018)

Neurodivergent individuals encounter challenges in outdoor settings, such as sensory overload and navigating unfamiliar environments on a regular basis and these already existing neurodivergent challenges can be heightened for neuroqueer individuals, who face discrimination based on their identity. Recognising and understanding the interplay of neurodivergence and queerness is vital for building a more inclusive and equitable outdoor community (Loy-Ashe, 2023).

Neurodivergent individuals are more likely to have transgender and/or gender expansive identities than neurotypical individuals according to a significant amount of clinical research (Janssen et al., 2016; Strang et al., 2014; Warriar et al., 2020). Existing medico-psychiatric literature has described neurodivergence and transgender identities as "co morbidities" and they have hypothesised neurodivergence as a "cause" of transgender identity (Shapira & Granek, 2019). Several neurodivergent gender nonconforming participants of a qualitative study articulated their experience of (trans)gender like an evolution. This process of evolution often involved identifying with binary trans identities and then later coming to identify with non-binary or gender-fluid identities. They described their understanding of gender identity, has evolved to encompass something beyond binary womanhood or manhood (Bornstein,

2022).

Many neuroqueer individuals articulated that the unique perspective of being neurodivergent expanded their understanding and experience of gender. They theorised that, because of their ability to think in expansive and non-normative ways, they were better able to reject cis- and heteronormativity and connected neurodivergence and transness through a shared lens of being away from normativity. From this perspective, the interplay of neurodivergence and queerness liberates one from the rigid and binary gender expectations. For these individuals, realisation of being neuroqueer is a type of intersecting process. They found, it was impossible to pinpoint either neurodivergence or gender identity as happening 'first' in the development of self (Bornstein, 2022).

One of the neuroqueer participants in a qualitative study used a metaphor to describe their experiences of gender as that of a palette of paint. For them, different genders represented different colours on a palette, and they identified with the colours of paint but the colours could also be mixed into new colours. Sometimes they felt like identifying with no gender, "like an undipped brush." Many of my participants of this study expressed their genders as vague, uncertain, and difficult to explain. According to neuroqueer individuals, it is much easier to be comfortable being different when it comes to gender, when they are already so different. Their natural curiosity leads them to explore gender more frequently and deeply than neurotypicals. Neurodivergent people are more likely to disregard gender expectations because society and gender norms are overwhelmingly tied to the way neurotypicals interact with the world. For a lot of autistic individuals roleplaying was a safe haven and a supportive place to explore themselves and they take on different identities and personalities for this purpose. Hence

gender exploration was also one of the things they were able to do through the structured performance of roleplay (Koloni, 2019). Many gender non-conforming autistic writers have discussed viewing their bodies as tools, or objects through which to interface, however shoddily, with the world (Meyerding, 2003).

Even before conforming to societal expectations, natural behaviour of LGBTQ+ and autistic children are labelled as unusual or deviant (Lhant, 2022). Autistic individuals without intellectual disabilities are more likely to identify as gender diverse and receive a diagnosis of gender dysphoria compared to neurotypical individuals, exposing them to minority stress. Adolescents and young adults with autism who identify as transgender (ASD-Trans) face high risk of exclusion, stigma, discrimination, and violence from multiple sources. In addition, gender nonconforming individuals, regardless of neurotype, exhibit unconventional sexual preferences and relationship preferences with asexuality and neurodiverse relationship preferences play significant roles in gender nonconforming identities within neurodiversity and ASD communities. (Ekblad, 2018)

Individuals who identify as nonbinary, gender fluid, transgender, or gender expansive reported that they have anxiety, depression, and ADHD. Although some participants had affirming mental healthcare experiences, the vast majority faced barriers in accessing healthcare services. They eventually found and created their own pathways to healing through individual practices and community care after being dissatisfied with their care and turned away by providers (Baczewski, 2023).

### **GSM and Mental Health**

Research on gender and sexual minority (GSM) health and wellbeing in psychology, social and health sciences has been heavily influenced by the minority stress model (Frost & Meyer,

2023). LGBTQ+ individuals experience a variety of minority stressors that account for higher risk of mental health issues than heterosexuals, including experiences of prejudice, victimisation, discrimination, expectations of experiencing prejudice, internalised heterosexism, and concealment of identity (Puckett, 2016), due to which, the literature suggests that individuals -who are more aware of being stigmatised engage in strategies to conceal or decrease the visibility of their minority status (Dewaele, Van Houtte, & Vincke, 2014).

The complex nature of the relationship between identity concealment and gender expression varies across studies. According to some studies, femme-identified and feminine women conceal their identity more frequently compared to butch-identified and masculine women (Lehavot & Simoni, 2011; Levitt et al., 2012). However, there is no significant difference in concealment levels based on gender expression according to recent findings (Blair & Hoskin, 2015). Additionally, a study on LGBTQ youth revealed no association between outness and gender nonconformity (Toomey et al., 2010). Furthermore, findings of this study support the association between gender nonconformity and mental health factors, such as, psychological distress and social anxiety (Puckett, 2016). Previous research has illustrated that gender nonconformity in childhood can be predictive of psychological distress in adulthood for gender and sexual minority (GSM) individuals (Li et al., 2016).

General stressors like losing a job or marriage, minority individuals are subjected to special stressors like discrimination in employment or antigay violence which adds to their existing struggles. These experiences have a higher chance of leading to hyper-vigilance, personal identification with minority status, or worse mental health issues such as negative self-perception or internalised homophobia (Cyrus, 2017). Nonetheless, the minority identity could also become a source of strength if there is a positive associated with opportunities for support that can neutralise the impact of this stress. (Branscombe et al., 1999; Crocker & Major, 1989;

Miller & Major, 2000)

Minority stress, resilience, and micro-aggression's theories as a ground, Balsam, and colleagues (2011) created the LGBTQ-POC Micro-aggressions Scale to delve deeper into understanding and exploring the unique challenges faced by this population. The results indicated that LGBTQ-POC micro-aggression's may be connected to depression and heterosexism in racial or ethnic minority communities may be especially harmful to the mental health of LGBTQ POC (Cyrus, 2017).

On psychological level, minority stress processes are hypothesised to cause emotional dysregulation, social and interpersonal problems, and maladaptive cognitive processes and schemas, which in turn elevate the risk of developing mental health issues such as depression, social anxiety (Hatzenbuehler, 2009; Pachankis, 2015). On the other hand, neurobiological exposure to minority stress may cause neural adaptations that are similar to those found in individuals with post-traumatic and other stress-related disorders (Nicholson et al., 2022). Further, minority stress disrupts the body's adaptive stress response and causes physical health impairments related to systemic inflammation (Flentje et al., 2020).

Parents and children in LGBTQ+ parent families encounter minority stress, but also enjoy positive identity aspects related to their family identity. Empirical evidence and theory indicate that these minority stressors and positive identity aspects are placed on the individual, couple, and family levels and may be associated with key issues, such as, parent and child health, family functioning, and school-related outcomes (Siegel et al., 2022)



The Depression, Anxiety and Stress Scale (DASS-21), by Lovibond and Lovibond, (1995) was used in a study to assess emotional states of depression, anxiety and stress across different intersecting subgroups of university students who identified with different minority status such as gender, sexual, racial, linguistic, citizenship minority status and relationship preferences, religiosity, socio-educational profile and presence of neurodivergent and mental health conditions. Gender minorities and cis women had higher scores than cis individuals and cis men respectively, distress level experienced among neurotypical cis men was mild and on the contrary it was severe for neurodivergent gender minorities. The interaction between gender and neurodivergence was significantly notable, suggesting that the intersectionality of these two might be displayed as higher DASS scores. Sexual minorities on average, had higher DASS-21 scores than heterosexual individuals, among both NT and ND population (Bayeh, 2022)

If LGBTQ+ individuals are undoubtedly vulnerable to excess mental distress and disorders due to social stress as a result of discrimination and stigmatisation, it is essential to understand and assess this risk, simultaneously infer about the factors that ameliorate stress and contribute to mental health. Only with such understanding psychologists, public health professionals, and public policymakers can work towards building effective prevention and intervention programs for the impacted individuals (Meyer, 2003).

Pearlin (1986) emphasised the importance of Merton's (1957/1968) work to stress theory, elucidating that "according to Merton, society stands as a stressor by stimulating values that conflict with the structures in which they are to be acted upon" (p. 371). There is a higher likelihood that minority people would be subject to such conflicts because dominant culture, social structures, and norms of the minority group are rarely reflected in the mainstream settings. One example of such a conflict is the lack of social institutions similar to heterosexual

marriage that offer sanction for family life and intimacy of LGBT persons. More generally, Moss (1973) explained that interactions with society equips the individual with information on how the world is constructed and health is compromised when information about the world is incongruent with the minority person's experience.

“Do LGBTQ+ people have a higher prevalence of mental disorders?” The answer is yes. However, it is a complicated answer because of methodological limitations in the available literature (Meyer, 2003). In the first group of studies reviewed by Meyer (2003), volunteers, who are more aware of mental health issues might have been attracted because of the interest in the study topic than non-volunteers. This may be one of the problem areas in studies of LGBTQ+ youth (Fergusson et al., 1999). As a group, LGBTQ+ youth respondents in studies may represent only a small portion, who are out of the closet, of the total population of LGBTQ+ youth (Savin-Williams, 2001) hence biasing the estimates of characteristics of the target population (Meyer, 2003). Population-based surveys were used in the second group of studies reviewed. These studies had better methodology. They used random sampling techniques; however, they too suffer from methodological issues. This is because none of these studies had a prior framework to assess mental health of this population (Meyer, 2003).

There are several reasons why LGBTQ+ individuals are more likely to report mental health problems than heterosexual individuals. Recognising their identity and coming out, most of them go through an important self-defining period which increases introspection. This could make them vulnerable to mental health problems. (Meyer, 2003)

Limited attention has been given to research, interventions or suicide prevention programs

targeting these populations despite the strong indications of elevated risk of suicidal behaviour (Haas et al., 2011). Death records do not routinely include the deceased person's sexual orientation, hence there is no official record to determine the suicide rates of LGBTQ+ people. Using “psychological autopsy,” researchers have strived to determine whether these groups are overrepresented among those who die by suicide. Each of these studies has revealed that same-sex sexual orientation is not overrepresented among suicide victims. Psychological autopsy studies that have investigated sexual orientation have employed relatively small samples size and have identified very few suicide decedents as having minority sexual orientation (Haas et al., 2011). However, the relationship between sexual orientation and nonfatal suicidal behaviour has been observed all over the world (Mathy, 2002a) and studies in the United States and elsewhere show that LGBTQ+ population have higher reports of suicide attempts (Haas et al., 2011).

### **Neurobiological Functioning and LGBTQ+ Community**

Studies have demonstrated that being neurodivergent can result in experiencing challenges as a child which in turn results in mental health issues in young adulthood. Executive function (EF) is one way of measuring these challenges for neurodivergent individuals., which involves skills such as planning, attention, and prioritisation and monitoring of tasks (Nesin-Perna, 2023)

Theory and preliminary evidence suggests that stress associated with minority identity results in negative emotions and attempts at suppression, which may contribute to depletion of executive function (McGarrity et al., 2020). 201 sexual minority adult women (SMW)

residing in the United States participated in a study which used online self report surveys as an inquiry method about intersectional experiences of discrimination, anticipation of discrimination, concealment of sexual orientation, internalisation of stigma, symptoms of anxiety and depression, executive functioning, and demographic variables. According to this study, among SMW, perceived experiences of discrimination, major experiences, and everyday experiences were significantly associated with self-reported executive functioning (EF) (Cook, 2023).

In the first experimental study to manipulate exposure to anti-gay attitudes and measure effects on executive function, 141 Participants engaged in a stressful interpersonal task with a confederate with anti-gay or pro-gay attitudes to examine how condition affected executive function, along with potential mediators such as state anger, anxiety, expressive suppression. However, participants in the anti-gay condition performed better post manipulation cognitive performance than the pro-gay condition contrary to hypotheses. This effect was partially mediated by anger. Participants in the anti-gay condition reported higher attempts at suppression, but this variable did not serve as a mediator.

Transgender youth need executive function (EF) to navigate gender discernment and gender affirmation. However, very little is known about factors associated with transgender youth. Elevated EF-related concerns among a notable subset of transgender youth is supported by a study which suggests that EF of transgender youth are impacted by a range of factors that may positively and/or negatively impact. The presence of ASD is clearly linked to poorer EF and autistic transgender youth experience EF problems averaging 1.5 ASD above the mean. Anxiety symptoms were also significantly related to EF problems with depression symptoms

being on the margin of ASD. On the border, anxiety symptoms and membership in the long-duration pubertal suppression group were associated with lower EF. On the other hand, gender affirming medical interventions, such as gender-affirming hormonal intervention status, were associated with EF. Parents of transgender youth receiving GAH had reported fewer EF problems when accounting for age, gender, assigned-sex, mental health, and ASD diagnostic status. However, it is unclear whether GAH intervention and its impact on gender congruence and/or hopefulness promotes better EF, or if youth had better EF skills prior to commencing GAH.

In the field of brain science, there has been ongoing research about the structural and functional differences between genders and LGBTQ+ individuals (García, 2021; Lanz & Brown, 2019). However, understanding the brains of those who accept diversity has been limited. One study explored brain health and diversity understanding through empathy mechanisms (Otsuka, 2023), this study essentially utilised the triple network model (Menon, 2019), consisting of the Central Executive Network (CEN), Salience Network (SN), and Default Mode Network (DMN).

The CEN is vital for many cognitive processes such as working memory, attention, problem-solving, and self-awareness, comprises the dorsolateral prefrontal cortex and posterior parietal cortex (Fox et al., 2006; Goldberg et al., 2006; Koechlin & Summerfield, 2007; Miller & Cohen, 2001; Owen et al., 2005; Smith & Jonides, 1998; Wager & Smith, 2003). Meanwhile, the SN, consists of the ventrolateral prefrontal cortex, anterior insula, and anterior cingulate cortex, responds to cognitive, homeostatic, or emotional salience (Goulden et al., 2014; Seeley et al., 2010), which regulates attention and cognitive control (Cai et al., 2015; Chen et al.,

2015; Ham et al., 2013; Menon & Uddin, 2010; Sridharan et al., 2008; Uddin, 2015).

Results demonstrated that individuals with higher gender equality understanding exhibited substantially higher CEN and relatively higher SN gray matter compared to estimated values based on age, gender, and BMI. Moreover, those with high LGBTQ+ understanding showed significantly higher CEN, SN, DMN, and whole-brain gray matter compared to estimated values (Otsuka, 2023).

## **Conclusion**

Intersectionality of neurodivergence and LGBTQ+ identities is an essential matter to understand the challenges and disparities faced by neuroqueer individuals. By incorporating different perspectives such as minority stress theory, neurodiversity research, and LGBTQ+ studies, the paper underscores the importance of understanding and addressing how discrimination, prejudice and stigmatisation acts as barriers for neuroqueer individuals to access essential resources, support systems, and opportunities. Moreover, by examining the neurobiological groundwork of LGBTQ+ identities, the need for more inclusive approaches in both research and practice to promote the well-being of all individuals becomes essential, regardless of their neurocognitive or sexual orientation. Overall, despite the growth in neuroqueer studies, there remains a significant gap in comprehending how these two identities intersect. This review calls for continued efforts to create affirming and supportive environments for the neuroqueer community.

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