

# Exploring Proximal LGBTQ+ Minority Stressors within Physical Activity Contexts From a Self-Determination Theory Perspective

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## Research

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# Abstract

**Background:** LGBTQ+ individuals experience challenges such as discrimination and marginalization (referred to as minority stressors) that are detrimental to their mental and physical health. Specifically, proximal or internalized LGBTQ+ minority stressors may influence motivation for and willingness to participate in physical activity.

**Methods:** The purpose of this study was to explore whether proximal LGBTQ+ minority stressors, as indicators of the social-environmental context, would relate to the basic psychological needs—motivation—physical activity pathway, as per self-determination theory. An online cross-sectional survey was completed by 778 LGBTQ+ adults.

**Results:** Results from structural equation modelling analyses support that proximal LGBTQ+ minority stressors are associated with decreased reported need satisfaction ( $\beta = -.36$ ) which, in turn, is associated with autonomous motivation ( $\beta = .53$ ) and reported physical activity participation ( $\beta = .32$ ).

**Conclusions:** Future research focused on increasing LGBTQ+ participation in physical activity should investigate the effects of (a) reducing proximal LGBTQ+ minority stressors, and (b) better supporting LGBTQ+ adults' autonomy, competence, and relatedness within physical activity contexts.

## Background

Regular physical activity participation has important benefits for physical health as well as mental well-being (Penedo & Dahn, 2005; Wankel & Berger, 1990; Warburton, Nicol, & Bredin, 2006). Research indicates that participating in 150 minutes of moderate-to-vigorous physical activity per week, in bouts of at least 10 minutes, can reduce the risk of obesity and improve cardiovascular health (CSEP, 2018). In addition, physical activity can reduce the risk of depression and feelings of anxiety and stress, and improve cognitive functioning, self-esteem, and mood (Faulkner & Taylor, 2005). Unfortunately, adults who self-identify as LGBTQ+ (lesbian, gay, bisexual, transgender, queer, etc.) experience discrimination, stigmatization, and marginalization that can complicate participation in or exclude them from participating in regular physical activity (e.g., Brittain & Dinger, 2015; Cary et al., 2016; Denison & Kitchen, 2015; Garbers et al., 2015; Greenspan, Griffith, Hayes, & Murtagh, 2019; Hargie, Mitchell, & Somerville, 2017). Intolerance towards LGBTQ+ communities can subsequently contribute to members of LGBTQ+ communities engaging in insufficient levels of physical activity. For example, a survey in the United Kingdom, demonstrated that 55% of LGBT men and 56% of LGBT women (vs. 33% and 45% of the general population) were not physically active enough to maintain good health (The National LGB&T Partnership, 2016). A study analyzing disparities in physical activity participation among American high school students ( $N = 13,933$ ) found that sexual minority men and women were significantly less likely to be physically active than their heterosexual counterparts (Mereish & Poteat, 2015). Similarly, in Canada, data show that only 53.8% of gay, lesbian, and bisexual-identified individuals are at least moderately physically active (Statistics Canada, 2015). Subsequently, LGBTQ+ adults, when compared to their

heterosexual counterparts, experience a higher prevalence of mental and physical health concerns, such as depression, hypertension, diabetes, cardiovascular disease, and limited mobility that can be mitigated through regular engagement with physical activity (Daniel & Butkus, 2015; Fredriksen-Goldsen, Kim, & Barkan, 2011; Igartua, Gill, & Montoro, 2003; Institute of Medicine Committee on Lesbian Gay Bisexual and Transgender People, 2011).

One critical factor that determines a person's likelihood of engaging in physical activity is their motivation (Duncan, Hall, Wilson, & O, 2010; Teixeira, Carraça, Markland, Silva, & Ryan, 2012; Wilson, Mack, & Grattan, 2008). Self-Determination Theory (SDT) is a well-established theory of human motivation that has been used extensively within physical activity contexts (Ryan & Deci, 2000; Teixeira et al., 2012). Within SDT, motivation is viewed as a multidimensional concept ranging from low (controlled) to high (autonomous) qualities of motivation (Ryan & Deci, 2000). Social contexts influence the variability in motivation through the satisfaction of three basic psychological needs: (a) competence, (b) autonomy, and (c) relatedness (Ryan & Deci, 2000). Competence is the need to feel like you possess the necessary ability, knowledge, and/or skills to do something successfully. Autonomy, experiencing choice in one's actions and acting in accordance with personal values and beliefs, speaks to the universal urge to be individual casual agents (Ryan & Deci, 2000). Lastly, relatedness is the need to interact with and feel connected to others. Higher degrees of satisfaction of these three basic psychological needs within physical activity contexts culminates in more autonomous motivation, which in turn leads to an increased likelihood to engage in physical activity (Ryan & Deci, 2000; Teixeira et al., 2012).

Qualitative research with LGBTQ + participants suggests that the basic psychological needs are associated with motivation to engage in physical activity (Fogel, Young, Dietrich, & Blakemore, 2012; Herrick & Duncan, 2018b; Muchicko, Lepp, & Barkley, 2014; Roper & Polasek, 2006). In a qualitative exploration of a predominantly gay fitness facility in San Francisco ( $N=14$ ), members described the facility as a safe space to engage with their bodies as well as the gay community (Roper & Polasek, 2006). Participants found this sense of relatedness added to their experience and encouraged them to exercise. Similarly, an investigation into a lesbian weight-loss group ( $N=20$ ) found that the main reason members continued to attend weekly check-in meetings was due to the fostered sense of community (Fogel et al., 2012). These findings speak to the importance of satisfying the need for relatedness among members of LGBTQ + communities when engaging in physical activity. Some LGBTQ + adults recalled formative, negative experiences with physical activity that adversely influenced their perceived competence to exercise (Herrick & Duncan, 2018a). Therefore, among LGBTQ + adults, it appears that there is an important relationship between need satisfaction and physical activity; however, the satisfaction of psychological needs for LGBTQ + adults in physical activity contexts may be complicated by homophobia, transphobia, and other stressful prejudicial experiences (Herrick & Duncan, 2018a, 2018b; Jones, Arcelus, Bouman, & Haycraft, 2017; Pérez-Samaniego, Fuentes-Miguel, Pereira-García, López-Cañada, & Devís-Devís, 2018).

According to SDT, environmental factors like stress can have a significant influence on the quality of a person's motivation (Ryan & Deci, 2000). LGBTQ + persons often experience unique prejudicial stressors

which are commonly referred to as minority stressors (Meyer, 2003). The Minority Stress Model (MSM) is a psychological framework that posits the existence of such stressors that exist on a distal-proximal axis (Frost, Lehavot, & Meyer, 2015; Meyer, 2003, 2015). Distal minority stressors are context-specific and caused by direct instances of discrimination, victimization, and stigmatization (Mereish & Poteat, 2015). Proximal minority stressors are more pervasive and result from an individual's own perceptions of themselves, an event, or society (Meyer, 2003). Subsequently, proximal stressors can also be interpreted as by-products of distal stressors or the internalization of distal stress (Meyer, 2003). For LGBTQ + communities, proximal stressors include the internalization of sexual prejudice, the concealment of one's own sexual or gender identity, and the development of expectations that future prejudice will occur (Mereish & Poteat, 2015). For example, LGBTQ + adults may choose to modify their dress, speech, and behaviour to actively pass as cisgender and/or heterosexual to avoid potential conflict within physical activity contexts (Herrick & Duncan, 2018a). However, concealment of identity, even when used as a vigilance tactic, can foster anxiety, shame, isolation, and intrusive thoughts (Meyer, 2003).

## Proposed Model

The MSM is primarily concerned with how unique minority experiences can produce pernicious psychological stressors. SDT acknowledges how social environments influence psychological need satisfaction and LGBTQ + minority stressors, as proposed by MSM, may be incorporated into the SDT framework in order to represent LGBTQ + self-perceptions of social environments. Given that LGBTQ + proximal stressors (a) indicate an individual's self-perceptions, (b) often result from distal stressors, and (c) are not contextually bound, a non-context specific measure of LGBTQ + proximal stressors may be used to represent the social environment. Subsequently, the purpose of this study was to explore whether proximal LGBTQ + minority stressors would relate to the basic psychological needs—motivation—physical activity pathway, as proposed by SDT. We hypothesized that higher levels of reported proximal LGBTQ + minority stressors would be associated with decreased satisfaction of the three basic psychological needs within physical activity, which in turn would be related to lower qualities of reported motivation, and a lower likelihood of reporting engaging in physical activity.

## Methods

### Participants and Procedures

To be eligible for this study, participants were required to be 18 years or older, self-identify as LGBTQ+, engage in some amount of physical activity (e.g., more than 0 minutes of self-reported physical activity/week), understand written English, and have access to the Internet. Participants were recruited online through public LGBTQ + community forums and groups, primarily through Facebook. No incentive was offered to participants. The online survey was hosted on Qualtrics and responses were collected for six months, from August 2017 to January 2018.

This study received institutional approval from the McGill University Research Ethics Board (REB-II). After reading a brief overview of the study, its purpose, and potential risks, participants provided their informed consent for participation in the online survey.

## Measures

**Demographics.** Data were collected about participant's sexual orientation, current gender identity, gender assigned at birth, and how many years (if any) they have publicly identified as LGBTQ+. Participants reported their age, ethnicity, highest level of education, annual household income, and relationship status.

**LGBTQ + minority stressors.** The three subscales designed to solely assess proximal stressors from the Daily Heterosexist Experience Questionnaire (DHEQ; Balsam, Beadnell, & Molina, 2013) were used to measure general proximal LGBTQ + minority stressors. The DHEQ is not specific to physical activity contexts. We administered a 20-item scale that used the stem "How much has this problem distressed or bothered you in the past year?". Participants responded on a six-point scale of 0 (*did not happen/not applicable to me*) to 5 (*it happened, and it bothered me EXTREMELY*). The three subscales were: (a) vigilance (e.g., "Watching what you say and do around heterosexual people";  $\alpha = .86$ ), (b) vicarious trauma (e.g., "Hearing other people being called heterosexist slurs";  $\alpha = .89$ ), and (c) isolation (e.g., "Hiding part of your life from other people";  $\alpha = .76$ ). All three subscales were comprised of the mean of all corresponding items, which were collapsed into three observed variables to form a single latent variable representing proximal LGBTQ + minority stressors.

**Psychological need satisfaction.** To measure the psychological need satisfaction within physical activity contexts the Psychological Need Satisfaction in Physical Activity Questionnaire (PSNE-PA; Gunnell, Wilson, Zumbo, Mack, & Crocker, 2012; Wilson, Rogers, Rodgers, & Wild, 2006) was used. The PNSE-PA is comprised of 18 items, divided equally across three subscales (perceived competence, autonomy, and relatedness satisfaction). Each item is rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). All subscales were confirmed to have high internal consistency: perceived competence (e.g., "I feel that I am able to complete physical activities that are personally challenging to me";  $\alpha = .94$ ), perceived autonomy (e.g., "I feel like I have a say in the physical activities I do";  $\alpha = .93$ ), and perceived relatedness (e.g., "I feel connected to the people I interact with when I do physical activity";  $\alpha = .93$ ). The PNSE-PA can be scored by assessing the mean of each subscale independently. To reduce non-normality in the data, the number of observed variables was reduced through parceling items (Little, Cunningham, Shahar, & Widaman, 2002). Given that item parcels are acceptable when the set of parcels reflects a unidimensional factor structure (Hagtvet & Nasser, 2004), three observed variables for each psychological need were created through parceling.

**Motivation.** The Behavioral Regulation in Exercise Questionnaire, version 3 (BREQ-3; Markland & Tobin, 2004; Wilson, Rodgers, Loitz, & Scime, 2007) was used to assess exercise motivation according to the SDT framework. The BREQ-3 was adapted from the original BREQ (Mullan, Markland, Differences, & 1997, 1977) and the modified BREQ-2 (Markland & Tobin, 2004). In line with previous research, we

replaced all instances of the word “exercise” with “physical activity” (Aelterman et al., 2012; Gunnell et al., 2012; Verloigne et al., 2011). The BREQ-3 is a 24-item self-report measure in which each item is rated on a 5-point scale ranging from 0 (*not true for me*) to 4 (*very true for me*). The BREQ-3 can be categorized into autonomous (e.g., “It’s important to me to participate in physical activity regularly”;  $\alpha = .89$ ) and controlled (e.g., “I participate in physical activity because other people say I should”;  $\alpha = .88$ ) motivation. In line with previous research (Moreno Murcia, López De San Román, Martínez Galindo, Alonso, & González-Cutre, 2008; Rouse, Ntoumanis, Duda, Jolly, & Williams, 2011; Ulstad, Halvari, & Deci, 2019), parceling was also used to create three observed variables representing autonomous motivation, as well as three observed variables representing controlled motivation (Little et al., 2002; Russell, Kahn, Spoth, & Altmaier, 1998).

**Physical activity levels.** The modified Godin Leisure Time Exercise Questionnaire (Godin & Shephard, 1985) was used to measure the current physical activity levels of the participants. Participants reported the number of bouts of vigorous, moderate, and mild intensity physical activity they performed in an average week, as well as the typical length (in minutes) of the bouts. Weekly moderate-vigorous physical activity (MVPA) was then calculated by combining the total minutes of strenuous and moderate physical activity per week (Buman et al., 2011; McFadden, Fortier, Sweet, & Tomasone, 2020; Michalovic, Hall, Duncan, Bassett-Gunter, & Sweet, 2018).

Given the length of the survey, five check-point questions were also incorporated throughout (e.g., “Please select ‘Agree Strongly’ if you are reading this question) to reduce insufficient effort responding.

## Analyses

A structural model predicting how proximal LGBTQ + minority stressors relate to the motivational sequence as proposed by SDT was examined. Specifically, this 5-factor model tested the role of (a) proximal minority stressors on (b) participants’ need satisfaction and how this was related to (c) autonomous and (d) controlled motivation and predicted (e) MVPA levels (see Fig. 1). As the model would be tested using maximum likelihood robust estimation, which is robust to non-normality, no adjustments were made to the variable distributions (Muthén & Muthén, 2010). Model fit was assessed using the Satorra–Bentler (SB) scaled chi-square and the standardized root mean square residual (SRMR) as absolute fit indices; the Tucker–Lewis index (TLI) as a relative fit index; and finally, the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) as noncentrality-based indices. Values below .08 (SRMR and RMSEA) and above .90 (CFI and TLI) represented adequate fit (Hooper, Coughlan, & Mullen, 2008).

## Results

### Preliminary Analyses

A total of 1,305 surveys were submitted. Participants that did not meet our eligibility were excluded ( $n = 141$ ) and the data were cleaned by excluding participants that answered three or more check-point

question incorrectly ( $n = 527$ ), leaving a final sample of 778 participants. The data were standardized to identify univariate outliers, which were recoded to the most extreme, but within normal range, value (Tabachnick & Fidell, 2001). The scoring distributions of the model's variables were examined (skewness range:  $-.749$ – $3.160$ ; kurtosis range:  $-1.210$ – $10.481$ ), and although the distributions were problematic, this was expected as non-normal distributions occur frequently in social science data (Barnes, Cote, Cudeck, & Malthouse, 2001).

## Demographics

The final sample retained after data cleaning included responses from 778 participants ( $M = 29.4$  years;  $SD = 9.2$  years; range = 18–69). For a detailed demographic breakdown of our participants see Table 1. Although our sample was comprised of mainly cis-women ( $n = 370$ ; 47.6%), our sample also consisted of a high percentage of nonbinary people ( $n = 172$ ; 22.1%). Our sample was quite diverse in terms of sexual orientation, with the bulk of participants identifying as gay/lesbian ( $n = 228$ ; 29.3%) or queer ( $n = 205$ ; 26.3%). All participants that submitted multiple sexual orientations, but also selected “questioning/unsure” were coded as questioning ( $n = 18$ ; 2.3%). On average, participants had been publicly identifying as LGBTQ+ or “out” for 8.5 years ( $SD = 7.7$ ; range: 0–49). Only 62 participants indicated that they did not publicly identify as LGBTQ+ (i.e., 0 years). Our sample was also primarily white ( $n = 605$ ; 77.8%), had a university degree ( $n = 442$ ; 56.8%), and had an annual household income of less than \$50,000 ( $n = 362$ ; 50%).

## Final Model

We first sought to test a model to examine the full sequence of proximal LGBTQ+ minority stressors, psychological needs, motivation, and physical activity levels. In early analyses the relationship between proximal LGBTQ+ minority stressors and need satisfaction resulted in Heywood cases. To resolve this, the three psychological needs were placed as observed variables to create one latent variable, representing a general measure of total basic psychological need satisfaction.

First, the measurement model demonstrated good fit, (SB  $\chi^2_{(48)} = 136.191$  (1.0733);  $p < .001$ ; RMSEA = .07, 95% CI [.05, .08]; SRMR = .05; CFI = .97; TLI = .96). Item loading coefficients suggested that all indicator variables related to their intended construct. Next, the proximal structural model had a good fit, (SB  $\chi^2_{(71)} = 207.406$  (1.0579);  $p < .001$ ; RMSEA = .07, 95% CI [.06, .08]; SRMR = .07; CFI = .95; TLI = .94). In the model (Fig. 1), proximal minority stressors were shown to have a negative relationship with psychological need satisfaction within physical activity ( $B = -.35$ ; 95% CI [-.50, -.22]). Need satisfaction had a positive relationship with autonomous motivation ( $B = .96$ ; 95% CI [.79, 1.15]) and a negative relationship with controlled motivation ( $B = -.12$ ; 95% CI [-.24, .01]). Only autonomous motivation had a statistically significant positive relationship with MVPA ( $B = 65.75$ ; 95% CI [54.56, 78.11]). Overall, this model accounted for a small-to-moderate amount of variance in need satisfaction (13%), autonomous

motivation (53%) and MVPA levels (10%). The psychological needs were found to mediate the relationships between the proximal stressors and autonomous motivation (indirect effect coefficient =  $-.26$ ; 95% CI [ $-.35, -.17$ ]), and autonomous motivation mediated the relationship between the psychological needs and MVPA (indirect effect coefficient =  $.23$ ; 95% CI [ $.09, .38$ ]).

## Discussion

Our results support that proximal stressors are associated with self-determination theory variables, acting as a negative social environment that lowers ratings of need satisfaction. Findings corroborated our hypothesis that higher levels of proximal LGBTQ + minority stressors would inhibit need satisfaction, culminating in lower qualities of motivation and lower levels of physical activity. In a systematic review, Teixeira et al. (2012) found autonomous motivation to be a robust predictor of physical activity across a variety of socio-environments, including different minority groups such as people of color and other special populations like breast cancer survivors. Given that our proposed model was a novel inclusion of proximal LGBTQ + minority stress as an indicator of the social-environmental context surrounding LGBTQ + adults within SDT, our findings extend the conclusions drawn by Teixeira et al. (2012) to this population.

In this study, proximal stressors were found to be negatively associated with need satisfaction within physical activity. Across studies exploring LGBTQ + engagement in physical activity, the most commonly-discussed proximal stressors were concealment of LGBTQ + identity and fear of rejection (e.g., Devís-Devís, Pereira-García, López-Cañada, Pérez-Samaniego, & Fuentes-Miguel, 2018; Hargie et al., 2017; Herrick & Duncan, 2018a, 2018b; Symons, O'Sullivan, & Polman, 2017; Symons, Sbaraglia, Hillier, & Mitchell, 2010). Specifically, adults often feel that when using locker and changing rooms they have to be vigilant and conceal their LGBTQ + identity to protect themselves from judgement and harassment (Hargie et al., 2017; Herrick & Duncan, 2020; Jones et al., 2017; Sykes, 2011). Participants in our study may have developed similar vigilance tactics when engaging in physical activity to avoid prejudicial altercations. Disclosure of sexual orientation, or 'coming out' has previously been explored within the framework of SDT (Legate, Ryan, & Rogge, 2017; Legate, Ryan, & Weinstein, 2012). Findings from a cross-sectional online survey with 161 LGB participants revealed that individuals were more likely to disclose their sexuality in autonomy-supportive contexts, regardless of their gender, age, or sexual orientation (Legate et al., 2012). The study by Legate et al. (2012) highlighted the complex relationship between LGBTQ + proximal stressors and psychological needs satisfaction, namely autonomy. If physical activity contexts were more autonomy-supportive of LGBTQ + adults, then perhaps fewer participants would engage in self-isolation through identity concealment. In a qualitative case study of an LGBTQ + friendly fitness center, participants ( $N= 14$ ) compared their fear and expectations of rejection when using predominantly heterosexual fitness settings with their current experiences using an LGBTQ + friendly fitness center (Roper & Polasek, 2006). When using the explicitly LGBTQ + friendly fitness center, participants felt a stronger sense of belonging or relatedness which in turn was found to reduce their fear and expectations of being rejected (Roper & Polasek, 2006).

Given LGBTQ + proximal stressors were found to be negatively associated with need satisfaction, future research should explore how to create a social context to minimize LGBTQ + proximal stressors within a physical activity context to better support the satisfaction of the need for autonomy, competence, and relatedness among LGBTQ + persons. In addition to the improvement of diversity training programs for physical activity practitioners (trainers, staff, coaches, etc.; Cunningham, 2012) and issuance of 'safe space' stickers to physical activity spaces (Ballard, Bartle, & Masequesmay, 2008), offering an array of explicitly LGBTQ+-friendly beginner fitness classes and workshops may greatly improve LGBTQ + experiences with physical activity. By supporting LGBTQ + need satisfaction, we can improve the quality of motivation experienced and subsequently the likelihood of LGBTQ + adults to engage in regular physical activity.

Within SDT, the three basic psychological needs can be satisfied or frustrated (Vansteenkiste & Ryan, 2013). However, psychological need satisfaction and frustration have been shown to be different constructs (Chen et al., 2015; Vansteenkiste & Ryan, 2013). This study provides evidence that proximal LGBTQ + minority stressors have a negative relationship with need satisfaction within physical activity contexts; subsequently, future research should examine whether LGBTQ + minority stressors frustrate psychological needs. However, the Psychological Need Thwarting Scale (PNTS) in Sport (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) or the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015) should first be adapted to physical activity contexts.

Previous studies suggest that overt homo/queer/trans-phobia and discrimination are common LGBTQ + distal stressors within physical activity settings (Atteberry-Ash & Woodford, 2018; Denison & Kitchen, 2015). Subsequently, participants in our study may have experienced similar instances of overt cis-heterosexism within physical activity contexts. Given that need satisfaction is context specific (Ryan & Deci, 2000), measuring distal LGBTQ + minority stressors that are specific to physical activity settings would greatly enhance our understanding of LGBTQ + experiences with physical activity. At present, there is no validated physical activity specific measure of LGBTQ + minority stressors, as such this measure should be constructed and validated in the future. However, despite this study's use of a non-physical activity specific measure of proximal LGBTQ + stressors, associations were found between proximal stressors and psychological need satisfaction. It is plausible that a physical activity specific measure of LGBTQ + minority stressors may result in a stronger relationship between LGBTQ + stressors and psychological needs.

The current study used a cross-sectional design, which did not allow for cause and effect conclusions to be drawn. Participants in this study were predominantly white, consequently, our sample may perpetuate classed white homonormativity that contributes to hierarchies of invisibility present within LGBTQ + communities (Logie & Rwigema, 2014). Future research should continue to explore how multiple minority identities (e.g., people of color, etc.) culminate in additional minority stressors (e.g., racial prejudice), that may negatively influence motivation to engage in physical activity (Melton & Cunningham, 2012). This study also did not have the capacity to conduct invariance testing for participants who publicly identified as LGBTQ+ ( $n = 716$ ) and those who did not ( $n = 62$ ). Our online recruitment methods relied heavily on pre-

existing LGBTQ + networks which may have biased our sample towards adults who were publicly 'out' as LGBTQ+. Future research should analyze how being closeted as LGBTQ + within physical activity settings influences the frequency of proximal minority stressors.

No theories have been specifically developed to explain broad LGBTQ + experiences within physical activity contexts. Despite the limitations, our study explored constructs of SDT in conjunction with proximal LGBTQ + minority stressors, within physical activity settings among a large-scale sample of LGBTQ + adults. Our study suggests that constructs of proximal minority stress are negatively associated with psychological need satisfaction, and subsequently motivation within physical activity. Armed with a greater understanding of LGBTQ + minority stress within physical activity, future research can focus on how to alter physical activity spaces, programs, and policies to better support LGBTQ + participation in physical activity by reducing the impact or frequency of psychological stressors.

## **Abbreviations**

LGBTQ+

Lesbian, gay, bisexual, transgender, and queer, etc.

SDT

Self-Determination Theory.

MSM

The Minority Stress Model.

## **Declarations**

### **Ethics Approval and Consent to Participate**

This study received institutional approval from the McGill University Research Ethics Board (REB-II).

### **Consent for Publication**

Not applicable.

### **Availability of Data and Material**

The data that supports the findings of this study are available from the corresponding author, [SH], upon reasonable request.

### **Competing Interests**

The authors declared no potential conflicts of interest or competing interests with respect to the research, authorship and/or publication of this article.

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## Authors Contributions

SH with the guidance of LH was solely responsible for the design and implementation of the study. SH then analyzed the data with assistance from MR and SS. SH was primarily responsible for the creation of the associated manuscript with the help of MR, SS and LH. All authors read and approved the final manuscript.

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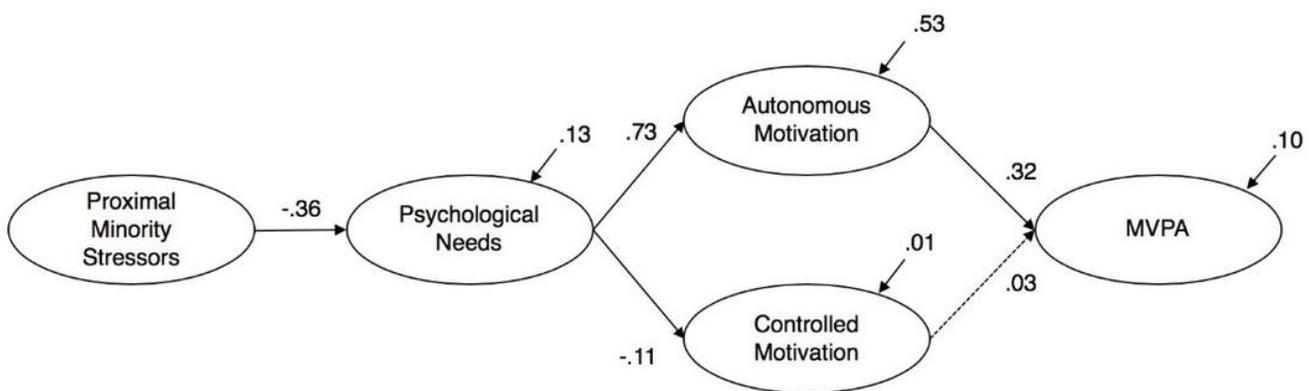
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## Figures



*Figure 1.* Final model. Solid lines represent  $p < .01$ . Dotted lines represent nonsignificant values. Values to the latent constructs represent the standardized residuals.

### Figure 1

Final model.

## Supplementary Files

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