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Factors for LGBT College Students That Predict Academic Success

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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MA, Walden University, 2018

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Dissertation Submitted in Partial Fulfillment

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Abstract

Much research has been done on LGBT students in relation to campus climate and academic achievement, which suggested that a positive campus climate may positively influence students' academic success. However, no research has yet been done to understand the value of campus climate, student levels of depression anxiety and stress, and student level of outness for predicting academic success. This quantitative study examined campus climate, depression, anxiety, and stress levels, and student level of outness together in their ability to predict self-reported grade point average of LGBT college students. Basic Psychological Needs Theory, a sub theory of Self-Determination Theory, was used to explain the findings. Data were collected from 120 participants via a participant pool at an online, public university, a Facebook group for LGBT college students in North Carolina, and Amazon MTurk, using the 14-item Depression, Anxiety, and Stress Scale (DASS-14); the Lesbian, Gay, Bisexual, and Transgendered Climate Inventory (LGBTCI); and the Outness Inventory (OI). The data were analyzed using a hierarchical linear regression analysis. The results of this analysis were not significant, indicating that campus climate, depression, anxiety, and stress levels, did not predict student academic success. The results of this study suggested that further research is necessary to fully understand the factors that predict LGBT student academic success. Such research could include alternative variables such as self-esteem, religiosity, and resiliency as well as a larger sample. This research has the potential to inform schools about factors that affect their LGBT student population in their academic success, which in turn could improve policy and teaching practices leading to positive social change.

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Chapter 1: Introduction to the Study

Research on lesbian, gay, bisexual, and transgendered (LGBT) college students is abundant and continuously growing. This research has focused a lot of attention on mental health issues (Almeida et al., 2009; Schmidt et al., 2011; Woodford et al., 2012), campus climate (Almeida et al., 2009; Kosciw et al., 2013; Mathies, et al., 2019; Nadal, et al., 2011; Schmitt et al., 2014), academic achievement (Brandao et al., 2017; Costa & Faria, 2020; Garvey et al., 2018; Oswalt & Wyatt, 2011; Saenz et al., 1999), and other aspects of LGBT college students' campus life. Additionally, it is known how discrimination, depression, anxiety, and stress can affect a student's academic achievement (Brandao et al., 2017; Costa & Faria, 2020; Garvey et al., 2018; Oswalt & Wyatt, 2011; Saenz et al., 1999). It is also known how discrimination can affect a students' mental health in terms of depression, anxiety, and stress (Abreu & Kenny, 2018; Almeida et al., 2009; Oswalt & Wyatt, 2011; Schmitt et al., 2014; Silverschanz et al., 2008; Woodford et al., 2012). However, the literature was missing a consideration of the effect of campus climate; depression, anxiety, and stress levels; and level of outness as predictors of self-reported GPA. Knowing how these aspects of campus and personal life affect LGBT students' self-reported GPA can be important for educators in helping to provide their students with better opportunities for learning.

Background

Research suggests that more people are continuing their education beyond high school than in previous years (Duffin, 2020; Institute of Education Sciences – National Center for Education Statistics [IES-NCES], 2018). This is likely due, in part, to an

increase in jobs requiring a college or graduate degree (Richards & Terkanian, 2013). Thus, it is important that students are provided with the best possible educational advantages, so they have the best opportunities for true learning to occur.

In order for students to have better opportunities to learn, it is important to understand what factors may be involved in student learning. Research suggests that a few of these factors are perceived discrimination based on race, gender, and/or sexual orientation (Garvey et al., 2018; Mathies, et al., 2019; Oswalt & Wyatt, 2011; Schmidt et al., 2011) and instances of depression, anxiety, and/or stress (Brandao et al., 2017; Hartley, 2011). While all students may encounter these challenges, LGBT students encounter these challenges in unique ways, and often to a greater degree when compared to their heteronomative counterparts.

LGBT students have been shown to be at increased risk for discrimination when compared to heterosexual, cisgendered students (Alessi et al., 2017; Brown et al., 2004). Additionally, instances of discrimination have been shown to have negative consequences for LGBT students' mental and physical health (Almeida et al., 2009; Clark, 2014; Nadal, et al., 2011; Oswalt & Wyatt, 2011; Schmitt et al., 2014). In addition to discrimination and mental/physical health concerns, LGBT students' academic performance has also shown to be affected by the extent to which they are open about their LGBT identity, or "outness" (Dentato et al., 2014; Kosciw et al., 2015). It is important to understand these factors, as there is a large and growing population of LGBT college students in the United States (Postsecondary National Policy Institute [PNPI], 2018).

In the current literature, the criterion variable of LGBT college students academic achievement, as shown through self-reported GPA, had not yet been studied with the predictor variables of campus climate; depression, anxiety and stress levels; and level of outness taken together. This study sought to fill that gap in knowledge.

Problem Statement

Increasingly, jobs and careers require a college degree (Richards & Terkanian, 2013). As a result, an increase in both younger and older adults are pursuing higher education (IES-NCES, 2018). For this reason, it is important that students are given the best opportunity to learn while in college. Research suggests that mental health is positively related to overall GPA (Hartley, 2011). Additionally, research suggests that perceived prejudice and discrimination negatively impact a person's mental and emotional wellbeing (Schmitt et al., 2014), specifically perceived discrimination based on sexual orientation (Almeida et al., 2009). Campus climate is the collection of attitudes, behaviors, and standards shown by both students and employees for inclusion and respect of various individual groups (Garvey et al., 2017; Rankin, 2005). The predictor variables campus climate; depression, anxiety, and stress; and level of outness each significantly predict the outcome variable of self-reported GPA (Almeida et al., 2009; Brandao et al., 2017; Dentato et al., 2014; Garvey et al., 2018; Oswalt & Wyatt, 2011; Schmitt et al., 2014).

While many studies have examined LGBT college life and campus climate, most of these have focused on the direct effects of discrimination or prejudice on the student's mental health (Almeida et al., 2009; Nadal, et al., 2011; Oswalt & Wyatt, 2011; Schmitt

et al., 2014) or academic achievement (Garvey et al., 2018; Oswalt & Wyatt, 2011; Rankin, 2005). Additionally, Dentato et al. (2014) suggested that students' level of outness related to their sexual or gender identity is positively correlated with their perceptions of positive or negative campus climate. That is, the students who were more "out" showed perceptions of higher acceptance by various others on their campus, which in turn relates to their depression, anxiety, and stress levels via positive social support from other LGBT students and faculty (Dentato et al., 2014). Outness is defined by the openness and expressiveness of LGBT identities in the public domain (Dentato et al., 2014). Finally, Woodford and Kilick (2015) suggested that mental and emotional well-being are correlated positively with academic achievement. Thus, in the present study I have focused on the relationship between the following predictor variables: (a) campus climate as measured by the lesbian, gay, bisexual, and transgendered climate inventory (LGBTCI; Liddle et al., 2004); (b) student level of outness as measured by the outness inventory modified version (Mohr & Fassinger, 2000; Resnick & Galupo, 2019); and (c) student depression, anxiety, and sress levels (DASL) as measured by the 14-item Depression Anxiety Stress Scales (DASS-14; Wise et al., 2017a); and (d) the criterion variable of self-reported GPA as measured by student self-report.

This was a significant gap where the predictor variables campus climate, student level of outness, and DASL had not yet been studied in relation to the criterion variable self-reported GPA. Additionally, the general societal trend is towards an emphasis on higher education—and subsequently the expectation that students will finish a higher education degree having learned something that can then be applied within their society.

In this study I have addressed the gap and provided insight into potential predictor variables and their relationships with student self-reported GPA.

Purpose of the Study

The purpose of the study was to explore the relationship between the predictor variables campus climate, student level of outness and student DASL, and the criterion variable of student self-reported GPA. To examine this relationship, the study collected quantitative data examining these variables. Some of the data was collected from students at an online public university in the United States, as well as through various LGBT college student groups on Facebook. The remaining data was collected through Amazon Mechanical Turk (MTurk). The primary instruments that were utilized to assess campus climate were surveys designed to understand student perceptions about their university in terms of campus climate, DASL, and level of outness. Students' current self-reported GPA was used as the criterion variable. To measure campus climate, the LGBTCI (Liddle et al., 2004) was used. Student DASL was measured with the 14- item DASS-14 (Wise et al. 2017a), and level of outness was measured using the outness inventory, modified version (Resnick & Galupo, 2019).

Research Questions and Hypotheses

The following are the research questions and hypotheses for the current study:

Research Question 1 (RQ1): Quantitative: Does campus climate significantly predict student self-reported GPA when level of outness and DASL are accounted for?

$H_0$1: Campus climate does not significantly predict student self-reported GPA, when level of outness and DASL are accounted for.

$H_1$1: Campus climate significantly predicts student self-reported GPA, when level of outness and DASL are accounted for.

Research Question 2 (RQ2): Quantitative: Does student level of outness significantly predict self-reported GPA when campus climate and DASL are accounted for?

$H_0$2: Student level of outness does not significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

$H_1$2: Student level of outness does significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

Research Question 3 (RQ3): Quantitative: Does students' DASL significantly predict self-reported GPA when campus climate and level of outness are accounted for?

$H_0$3: Student DASL does not significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

$H_1$3: Student DASL does significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

Theoretical Framework

The primary theoretical basis for the proposed study was the self-determination theory (SDT) by Deci and Ryan (2008b). SDT considers intrinsic and extrinsic sources of motivation and how they affect an individual's autonomy, competence, and relatedness (Deci & Ryan, 2008b). This in turn can inform academic achievement by considering mental, emotional, social, and environmental factors of a student's motivation to succeed academically. SDT considers extrinsic and intrinsic factors in motivation and learning

(Deci & Ryan, 2012). SDT focuses primarily on intrinsic, natural motivation which is in turn influenced by external, social factors. Normal development, motivation, and learning are accomplished through biological and psychological nourishment both intrinsically and extrinsically. If one of these is lessened (e.g., by lack of social support, poor mental or emotional wellbeing, etc.) then the natural, intrinsic motivational and learning abilities of the individual are also lessened, and the individual will exhibit less than ideal behaviors and experiences.

SDT is comprised of five micro-theories that describe different intrinsic or extrinsic motivation (Deci & Ryan, 2012). These are cognitive evaluation theory, causality orientations theory, organismic integration theory, basic psychological needs theory (BPNT), and goal content theory. This current study focused only on BPNT's influence on SDT, as this theory best predicted the outcome of the variables considered.

Basic Psychological Needs Theory

BPNT refers to the extent to which an individual achieves their basic psychological needs for autonomy (sense of self-reliance), competence (sense of self-capability), and relatedness (sense of closeness to others). Greater needs satisfaction results in higher levels of motivation, whereas lower needs satisfaction results in lower levels of motivation. The micro-theory BPNT informs the variables for the current study which were discrimination, DASL, and level of outness.

Discrimination

Higher instances of discrimination for LGBT students will reduce their motivation for a high GPA by reducing their feelings of self-worth (Park & Maner, 2009; Taylor et

al., 2020). This in turn would cause the student to believe themselves incapable or unworthy of academic success. Fewer occurrences of discrimination would have the opposite effect. This motivational factor would be predicted under the micro-theory BPNT. Instances of discrimination would reduce or remove feelings of relatedness in the individual, thus leading to lower motivation for high GPA due to the unfulfilled need for relatedness. In contrast, fewer instances of discrimination would fulfill the need for relatedness, thus allowing the individual higher motivation for a high GPA.

DASL

Lower DASL would promote feelings of adequacy and competence, thus allowing the student better motivation for a high GPA. Higher DASL would reduce these feelings, and thus lower the students' motivation. BPNT suggests that DASL is an intrinsic factor that can either positively or negatively influence the individual's motivational and learning ability. This relates to the individual's basic psychological need for competence: higher DASL reduces feelings of competence while lower DASL increases those same feelings.

Level of Outness

Students' level of outness would suggest the degree to which they are preoccupied with their LGBT status. Lower levels of outness would indicate more preoccupation with concealing their sexual orientation from others, and thus result in less motivation to succeed academically. SDT suggests that preoccupation is an intrinsic factor that would affect the students' motivational and learning ability by allowing less than ideal cognitive ability being put towards academic achievement. Additionally, this factor would likely

cause the student to consider negative consequences of being more out, thus potentially creating an extrinsic factor of motivation and learning as well. This relates to the micro-theory BPNT in terms of autonomy and relatedness. If the individual is not "out", and instead is preoccupied with concealing their LGBT status, then they are not fulfilling the basic need for autonomy—being one's own individual self. Additionally, the individual may not be satisfying the need for relatedness by not allowing every aspect of themselves to be seen by their community. Thus, the individual does not feel the interpersonal connection with others in their community. In contrast, if the person is fully "out", then they have achieved the need for autonomy, and have at least the possibility of achieveing the need for relatedness. This in turn would allow the individual higher motivation for academic achievement.

Nature of the Study

Quantitative

This quantitative, nonexperimental study explored how campus climate for LGBT college students, student level of outness, and student DASL related to self-reported GPA. This was a hierarchical linear regression study, and as such quantitative data best informed any existing correlations between the predictor variables (campus climate, student level of outness, and DASL) and the criterion variable (self-reported GPA). The measures of campus climate were derived from perceptions of campus climate using a campus climate scale. Student level of outness was measured using an outness scale. DASL was measured using the DASS-14. Self-reported GPA was a self-reported measure given by the participants.

Definitions

Anxiety is classified as a mood disorder in the DSM 5, and includes symtoms related to excessive fear of possible future events (American Psychiatric Association, 2013). For the purpose of this study, anxiety relates to symptoms of an anxiety disorder as found in the DSM 5.

Campus climate refers to external factors present at a college campus that influence an individual's feelings of support versus discrimination in relation to sex, race, ethnicity, LGBT status, etc. (Garvey et al., 2017). Campus climate is influenced by general perceptions and attitudes of the campus community towards a person or a group of people, and may be positive (showing support) or negative (showing prejudice and discrimination).

Depression is classified as a mood disorder in the DSM 5, and contains symptoms related to a depressed or unhappy mood (American Psychiatric Association, 2013). Some symtoms of depression are loss of interest or pleasure in life activities, weight loss or gain, and insomnia or sleeping too much. For this study, depression refers to the experience of one or more symptoms of a depressive disorder as found in the DSM 5.

Discrimination is any action that takes place to demean or cause harm to an individual based on a perceived difference in race, religion, LGBT status, or other personal difference (Crisp & Turner, 2010). The term is used within this study to mean discrimination towards specifically the LGBT community. Examples of discrimination are bullying (Abreu & Kenny, 2018; Cohen, 2019) and use of anti-LGBT terminology

such as “no homo”, “fag(got)”, or “that’s so gay” (Mathies, et al., 2019; Nadal, et al., 2011; Silverschanz et al., 2008; Woodford et al., 2012).

Outness refers to the extent to which an LGBT individual is open to others in their community about their LGBT identity (Dentato et al., 2014). An individual’s level of outness can change depending on what community groups they are out to, and how many people within those groups know about their LGBT status. For example, an individual may be out to their friends and family, but not to their instructors or church groups.

Stress is a physiological response to situational events. It is a feeling of physical or emotional tension, and is the body’s reaction to challenges or demands from life events (Medline Plus, 2018). Stress can occur in varying levels for many different reasons, and can be mitigated by various stress relieving activities (Bhandari, 2020).

Assumptions

I assumed, for the purposes of this study, that participants filled out the survey questions completely and honestly. I further assumed that the participants were of sound mind and were capable of making the decision to fill out the survey and understanding the questions contained within. Additionally, I assumed that participants honestly and accurately completed the demographics sections.

Scope and Delimitations

The scope of this study was a quantitative analysis of predictor variables (campus climate, DASL, and level of outness) in relation to a criterion variable (self-reported GPA) using a hierarchical linear regression analysis. The participants met the criteria of LGBT college students from a United States public university. Participants were obtained

via a link to the survey web site posted on the university's participant pool webpage and via a link posted on various LGBT college student Facebook groups. Additional participants were recruited via a link post on Amazon MTurk. Generalizability was limited by the small population from which the sample was taken, and by the nature of the individuals who chose to participate. The theoretical framework for this study was based on motivation and psychological needs theory.

Limitations

There are several potential limitations that were considered for this study. First, self-confidence was considered to be a possible a confounding variable in the anticipated relationship between level of outness and self-reported GPA. It is reasonable to expect that students with higher self-confidence are "out" to more people, or groups of people, and may be more willing to seek help and thus achieve a higher GPA. Second, religiosity was not accounted for in this study. It is reasonable to expect that religious factors, either within the student body or from the institution, may affect discriminatory occurrences. Third, this study was limited to the experiences of students at a single, online, public university in a specific region of the United States, to LGBT students responding to a Facebook post, and to LGBT students responding to an Amazon MTurk post. It is possible that LGBT students may have vastly different experiences in on-campus colleges, private colleges, community colleges, and other regions. Due to the anonymous nature of the study, and the nature of Facebook, these possible variables are not accounted for within this study. Fourth, the study may have been limited to LGBT individuals who are already out, as those who are not yet out may not have wished to

disclose their LGBT identity. Finally, the nature of this study was a predictive, hierarchical linear regression analysis. Thus, the data could only show predictive value of the predictor variables in relation to the criterion variable. No cause-and-effect relationship can be inferred from the results of this study.

Significance

This research filled a gap in the literature regarding the relationship between the predictor variables of campus climate for LGBT students, student level of outness and DASL, and the criterion variable of self-reported GPA; these variables had not yet been studied as a group. Thus, little was yet known about the relationship between these predictor variables and academic achievement. Additionally, this research is important for informing college students about campus climate, outness, and DASL and the effect that they can have on one's self-reported GPA, and for informing college policy and creation of resources for LGBT students to promote a better learning environment for all students. This, in turn, would promote quality educational practices, thus providing graduating college students the knowledge necessary to apply their degree to society and to their careers.

Summary

This present study focused on the lack of research on LGBT college students' academic achievement (self-reported GPA) in relation to campus climate, DASL, and level of outness. There is much research that has been done on each of these topics individually, but until now none had been conducted considering these factors together. Research shows that each of these factors are related to students' academic performance

(Brandao et al., 2017; Costa & Faria, 2020; Garvey et al., 2018; Kosciw et al., 2015; Mathies, et al., 2019).

To provide theoretical support and to understand these factors, this study used the BPNT, a subtheory of SDT (Deci & Ryan, 2008b). BPNT suggests that students are motivated to do well in school (obtain a high GPA) when three basic psychological needs are met: autonomy, competence, and relatedness.

This study used quantitative data, analyzed through the use of a hierarchical linear regression analysis. With this statistical framework came the research questions detailed previously.

This study made some assumptions, namely that the participants responded to all sections (demographic and main content) of the survey honestly and accurately, and that the participants were of sound mind and were capable of making the decision to participate in this study. Finally, this study had limited generalizability, as the results were localized to a single, online, public university in the United States, to LGBT college students responding to a Facebook post, and to LGBT college students responding to an Amazon MTurk post. Further research into this topic in other regions or school types (e.g. on-campus colleges, private religious colleges, Southern regions, community colleges, etc.) would improve the generalizability of the results.

Chapter 2: Literature Review

Increasingly, adults are pursuing higher education because more jobs are requiring a college degree. According to Richards and Terkanian (2013), jobs requiring a bachelor's degree for entry level positions is expected to climb 17.6% between 2012 and 2022. The years 2006-2016 showed an overall increase of 13% more full-time students enrolling in degree granting, postsecondary institutions, with an 11% increase of students aged 25 or higher (IES-NCES, 2018). It is important that students have the best possible opportunities for learning while pursuing higher education. Some factors that have been shown to influence learning in higher education are college campus climate (Kosciw et al., 2013; Garvey et al., 2015; Oswalt & Wyatt, 2011; Rankin, 2005; Garvey et al., 2018) and mental health (Hartley, 2011), with certain other factors influencing an individuals' mental health and learning in higher education, such as prejudice and discrimination (Schmitt et al., 2014), discrimination based on sexual orientation (Almeida et al., 2009), and level of outness (Kosciw et al., 2015; Watson et al., 2015). These three factors (discrimination, mental health, e.g., DASL, and sexual orientation) negatively influence the ability of instructors or schools to provide enhanced opportunities for learning in higher education. However, more research is needed to understand the various factors influencing student self-reported GPA.

Factors influencing student self-reported GPA are an important aspect of college life and student ability to learn. Some research already exists that has examined college campus climate (Garvey et al., 2018; Rankin, 2005), discrimination and/or prejudice (Almeida, et al., 2009; Nadal, et al., 2011; Schmitt et al., 2014), mental health (Oswalt &

Wyatt, 2011; Woodford & Kilick, 2015), outness (Dentato et al., 2014; Kosciw et al., 2015; Watson et al., 2015), and student learning (Oswalt & Wyatt, 2011). However, the variables of campus climate, DASL, and student level of outness had not been investigated as predictor variables of student self-reported GPA within the same investigation. Thus, the present study sought to fill that gap in the research, investigating the predictor variables of campus climate, DASL, and student level of outness to the criterion variable of student self-reported GPA. This chapter includes a review of the literature search strategy, theoretical foundation, the present literature on campus climate, DASL, student level of outness, and academic achievement as it relates to LGBT college students.

Literature Search Strategy

The main database used for the literature search was Thoreau Multi-Database search, powered by EBSCOHost. PsycINFO was used for some literature, and PsycTESTS was used to find surveys directly related to the variables present in this study. Key search terms were as follows: *LGBT, campus climate, academic achievement, GPA, discrimination, depression, anxiety, stress,* and *outness*. Boolean phrases such as "AND" and "OR" were used to group terms. The most common groupings were *LGBT* "AND" *campus climate*, *LGBT* "AND" *academic achievement*, *LGBT* "AND" *discrimination*, and other combinations with *LGBT* as the first term.

Several thousand results were common with the search term *LGBT*; thus, the literature was narrowed by peer reviewed, academic journals and by year, with most of the literature having been published from 2005 to present. Cases in which fewer than 500

results appeared (e.g., when more than two search terms were applied simultaneously), the year limitation was removed to allow for more possible sources. Some sources were textbooks or websites, although the vast majority were from peer reviewed, academic journal publications.

Theoretical Foundation

The theoretical foundation for this study was Self-Determination Theory (SDT). SDT is a theory of motivation, development, and health (Deci & Ryan, 2008b), and is a macro-theory consisting of multiple separate micro-theories. The theory makes the assumption that people are, by nature, active and self-motivated and that social environments either support or thwart that intrinsic nature, thus enhancing or reducing one's motivation (Deci & Ryan, 2008a). SDT primarily consists of the differentiation between autonomous and controlled motivation (Deci & Ryan, 2008b). Autonomous motivation refers to the individual integrating their behaviors and motivation into their sense of self, thereby allowing for self-endorsement of their actions (Deci & Ryan, 2008b). Controlled motivation refers to externalization of motivation factors such as reward/punishment, which in turn allow the person to consider their actions to be the result of their environmental factors.

SDT further considers biological and psychological needs that, when present, allow for healthy development and psychological well-being (Deci & Ryan, 2012). The theory mainly focuses on psychological needs, specifically the needs for competence, autonomy, and relatedness. Competence is the need to develop skill and ability, autonomy is the need for individual choice and freedom, and relatedness is the need for

closeness to others and a sense of belonging. The absence of these needs results in less-than-ideal development, behavior, and functioning.

Initially, SDT was comprised of four micro-theories: cognitive evaluation theory (CET), organismic integration theory (OIT), causality orientations theory (COT), and basic psychological needs theory (BPNT; Deci & Ryan, 2002). More recently, however, these micro-theories have expanded to also include Goal Contents Theory (GCT; Deci & Ryan, 2012). A fuller discussion of these micro-theories follows.

Cognitive Evaluation Theory

CET considers how external factors affect intrinsic motivation via perceived locus of causality (Deci & Ryan, 2012). Events such as rewarding behavior leads to an external locus of causality and undermines the need for autonomy by affecting the individual's perception of having autonomy. In contrast, events based on choice lead to an internal locus of causality, and therefore support the need for autonomy by again affecting the individual's perception of having autonomy.

CET also focuses on the need for competence and the way in which external events affect the individual's perception of that need (Deci & Ryan, 2012). Events such as positive feedback lead to perception of competence, whereas negative feedback leads to perception of incompetence. This feedback, whether positive or negative, can either improve or undermine intrinsic motivation.

Organismic Integration Theory

OIT makes the assumption that individuals have an inherent integrative tendency in which the individual will take external cues and occurrences and internalize them to

either controlled motivation or autonomous motivation (Deci & Ryan, 2012). OIT further suggests that the internalization process is either supported or thwarted by the extent to which the individual accomplishes the three basic psychological needs: autonomy, competence, and relatedness. The better these needs are met the better internalization occurs and the more likely it is that the internalization will result in autonomous motivation.

Causality Orientations Theory

COT considers causality orientations that can be used to predict behavioral outcomes (Deci & Ryan, 2012). COT posits three different orientations: autonomous, controlled, and impersonal. Every individual is considered to have each of these orientations to some degree, and thus they can be used either separately or collectively to predict outcomes. Autonomous orientation refers to consideration of both internal and external cues in ways that support autonomy in the individual. Controlled orientation refers to the belief that cues are controls or demands, and the individual considers that they are being controlled by these cues. Finally, impersonal orientation refers to viewing cues as being indicative of incompetence.

Goal Content Theory

GCT focuses on an individual's life and personal goals and how they motivate behavior (Deci & Ryan, 2012). GCT identifies a difference between intrinsic goals, such as personal growth, affiliation, and community, and extrinsic goals, such as money, fame, and image. Depending upon the type of goal motivating the individual, they may achieve

higher self-actualization and greater life satisfaction (intrinsic goals) or less self-actualization and higher depression (extrinsic goals).

Basic Psychological Needs Theory

BPNT considers primarily the extent to which the basic psychological needs of autonomy, competence, and relatedness are met in a satisfying manner to the individual (Deci & Ryan, 2012). When these needs are met satisfactorily, the individual is more satisfied with their life and has a higher level of psychological well-being. Meeting these needs interpersonally has been shown to predict better performance and better psychological health and meeting them intrapersonally has been associated with more daily positive affect and better psychological health.

Current Study

This study focused on BPNT and its explanation of motivation to help understand the predictor variables and their relationships to the criterion variable. Each predictor variable was viewed by how the variable may affect the basic psychological needs. Campus climate related to the need for relatedness in that the student may not feel a personal connection with other students and/or faculty. DASL related to competence by the student possibly feeling a lack of ability to succeed with higher levels of depression, anxiety, or stress. Finally, level of outness related to autonomy by the student feeling more or less an autonomous, unique individual based on their level of outness. Additionally, level of outness related to relatedness in that the student who is less out may feel a lack of true connection with others in their community by not being totally honest about who they are. These in turn informed how the individual's motivation for a

high GPA was affected based on the predictor variables effect on the psychological needs.

Campus Climate

The term "campus climate" can refer to the collection of many different aspects of life at a college campus. It is defined by Garvey et al., (2017) as "the cumulative attitudes, behaviors, and standards of employees and students concerning access for, inclusion of, and level of respect for individual and group needs, abilities, and potential" (p. 796). For LGBT college students, this can include prejudice and discrimination factors (Schmitt et al., 2014; Ellis, 2009), religiosity (Sanabria, 2012), school policy, level of acceptance by other students and faculty, and heterosexism (Mathies, et al., 2019; Silverschanz et al., 2008). Perceptions of campus climate show variations across sex, LGBT status, and class level for college students (Brown et al., 2004). These factors collect to form what is referred to as "campus climate", showing a multidimensional construct of what influences the overall social and academic perceptions of the school for its students, as well as academic outcomes.

Campus climate can influence a students' academic achievement. For example, Kosciw et al. (2012) found that high school LGBT students showed decreased academic achievement when their high school campus climate was negative. Additionally, Garvey et al., (2018) indicated that students with more positive perceptions of campus climate factors showed greater academic achievement. This confirms that campus climate factors and perceptions of campus climate factors have a positive correlation with academic achievement. Among these factors of campus climate is religious affiliation.

Religious Affiliation

Many schools across the United States are affiliated with a particular religion. Some studies suggested that religious affiliation is related to campus climate for LGBT students (Worthen et al., 2017; Wolff et al., 2017; Rockenbach & Crandall, 2016; Sanabria, 2012). Worthen et al. (2017) found that religious affiliation correlated positively with negative attitudes towards LGBT students, and Wolff et al. (2017) suggested that affiliation with Christianity predicts increased instances of discrimination, such as harassment both verbal and sexual, threats, and physical violence towards transgender and gender-nonconforming students. Finally, Rockenbach and Crandall (2016) suggested that the strong presence of religion and spirituality on campus correlates to increased instances of discrimination and microaggressions towards LGBT students. This suggests that religious affiliation is associated with an increase of discriminatory behavior, which in turn is associated with a negative campus climate for LGBT students. This correlation can be mitigated for the campus climate by the addition and use of campus support programs for LGBT students.

Campus Support

Campus support programs make an appearance in many colleges across the United States. Campus support programs for LGBT students are, therefore, another factor that relates to campus climate (Kosciw et al., 2013; Evans, 2002; Kane, 2013). Programs such as the Gay-Straight Alliance (GSA) provide a climate of acceptance and inclusion, which can lead to a more positive experience for LGBT students (Kane, 2013; Kosciw et al., 2013; Horowitz & Hansen, 2008). Horowitz and Hansen (2008) additionally found

that schools which participated in LGBT support programs, specifically Out for Equity (OFE), showed an overall improvement in campus climate in terms of student perceptions of safety, comfort, and teacher intervention. Furthermore, Kosciw et al. (2013) found that institutional (school) support programs, policies, and personnel contribute to making schools safer and an overall more positive campus climate for LGBT students. Finally, campus support can also consist of inclusion of LGBT topics and role models in the curriculum. ReitKerk (2013) found that exclusion of LGBT topics in the curriculum and school activities has a negative impact on campus climate and academic achievement in LGBT high school students. This suggests that the existence and use of such programs has a positive correlation with campus climate for LGBT students and may help to mitigate feelings of discrimination and/or prejudice due to other factors.

Discrimination

Discrimination can be a concern for LGBT college students. Discrimination is characterized by negative words or actions towards a group of people on the basis perceived differences (e.g., age, race, sex, sexual orientation, etc.; Crisp & Turner, 2010). Discrimination towards the LGBT community is typically referred to as "heterosexism" (Nadal et al., 2011; Silverschanz et al., 2008), and can take multiple forms, such as bullying (Abreu & Kenny, 2018), heterosexist phrases (Mathies, et al., 2019; Nadal, et al., 2011; Woodford et al., 2012), anti-gay laws (Clark, 2014), etc. The various forms of discrimination can be cause for great concern for LGBT college students, possibly

introducing extra caution in a students' dealings with other people. Sometimes, one form of discrimination can occur in multiple ways as well.

Bullying behavior can consist of multiple forms, both in-person and via the internet. Behaviors such as name calling, social exclusion, physical violence, spreading of malicious rumors, and more all fall under the category of bullying (Cohen, 2019). When bullying is done based on a perceived difference (i.e., one's LGBT status), it can also fall under the category of discrimination. Heterosexist phrases are a subtle form of discrimination in which the individual uses anti-LGBT language in various social contexts. For example, use of the phrase "that's so gay" or "no homo" can be discriminatory phrases used as a joke, unintentionally, or on purpose that hurt the other person (Mathies, et al., 2019; Nadal, et al., 2011). Finally, anti-gay laws are in place at the level of country, state, or city that are specifically discriminatory towards LGBT individuals (Clark, 2014). For example, the United States only recently (June of 2015) legalized same-sex marriage across all fifty states. Prior to this time, same-sex marriages were not recognized as legal marriages in many parts of the country. In other countries, it is legal for someone to imprison (e.g., Ghana, Bangladesh, Egypt, and others) or execute (e.g., Yemen, Saudi Arabia, Somalia, and others) another person simply for being a part of the LGBT community (OutLife, n.d.). These forms of discrimination present challenges and possible difficulties to LGBT college students and can sometimes have mental and emotional ramifications.

Discrimination can often lead to mental or even physical health concerns. For example, depression (Almeida et al., 2009; Oswalt & Wyatt, 2011; Schmitt et al., 2014),

anxiety (Almeida et al., 2009; Oswalt & Wyatt, 2011; Schmitt et al., 2014), and sexually transmitted diseases (Clark, 2014) can all occur in positive correlation with discriminatory behaviors. Studies have shown that LGBT students are at higher risk of depression and anxiety when perceived discrimination is higher than heterosexual students (Almeida et al., 2009; Oswalt & Wyatt, 2011; Schmitt et al., 2014). Additionally, LGBT students have been shown to report greater instances of suicidal ideation and self-harm practices in correlation with perceived discrimination (Almeida et al., 2009). Furthermore, in countries where homosexuality is criminalized, higher rates of sexually transmitted diseases, such as HIV, are reported (Clark, 2014). These can be a contributing factor for LGBT students in deciding to out themselves and can be cause for great concern among the LGBT community at large. Finally, these concerns also can contribute to mental health issues for LGBT college students.

Mental Health: Depression, Anxiety, and Stress

Mental health concerns, such as depression, anxiety, and stress are another area of potential concern for LGBT college students. Mental and emotional wellbeing, depression, anxiety, and stress have been shown to be negatively associated with academic performance for LGBT students (Schmitt et al., 2014), with more LGBT students reporting negative mental health issues, such as depression and anxiety, than heterosexual students (Oswalt and Wyatt, 2011). Additionally, LGBT students experience higher instances of perceived prejudice and discrimination in the form of microaggressions, and these students also show greater mental health issues (Nadal, et al., 2011). Other research suggests that LGBT youth scored higher on depression scales when

perceived discrimination and prejudice are present than heterosexual students (Almeida et al., 2009). Schmitt et al. (2014) suggested that negative mental health outcomes, specifically depression and anxiety, were negatively correlated with academic performance. These findings reveal the negative relationship between student levels of depression and anxiety and academic performance, and that LGBT students are at greater risk for such issues than heterosexual, cis-gender students. Fortunately, mental health concerns, such as depression, have been extensively considered in prior research.

Depression

Depression can be a major concern for all college students, and LGBT students are no exception. LGBT students have been shown to be more at risk for increased depression levels (Almeida et al., 2009; Oswalt & Wyatt, 2011; Crawford & Ridner, 2018), often correlating with perceptions of prejudice and/or discrimination (Nadal, et al., 2011). Increased levels of depression have also been shown to correlate negatively with academic performance (Schmitt et al., 2014), which can be seen in lower grades and GPA. Higher instances and risk of depression can be cause for distress for LGBT college students. Fortunately, depression is a common occurrence, and has been extensively researched.

Depression is classified as a mood disorder in the DMS-5, and is often characterized by a generally negative mood, feelings of sadness and/or worthlessness, fatigue, and decreased pleasure in a day's activities (American Psychiatric Association, 2013). Additionally, individuals with a depressive disorder can often exhibit suicidal ideation, and sometimes suicidal attempts. There is more than one type of depression

classified in the DSM-5: major depressive disorder, persistent depressive disorder (dysthymia), substance/medication-induced depressive disorder, depressive disorder due to another medical condition, and specified or unspecified depressive disorders. For the purposes of this study, the term "depression" will apply as an umbrella term to include all types of depression.

As previously stated, LGBT students show an increased risk of depression (Almeida et al., 2009; Oswalt & Wyatt, 2011; Crawford & Ridner, 2018). When considering some of the possible symptoms of depressive disorders (e.g., decreased pleasure in a day's activities, and feelings of sadness and/or worthlessness), it is easy to understand how one's academic achievement might decrease (Schmitt et al., 2014) when the individual is depressed. However, depression is not the only concerning mental health factor for LGBT college students.

Anxiety

Anxiety can be another factor for LGBT college students' mental health. In addition to depression, anxiety levels also negatively correlate with students' learning and self-reported GPA (Wilcox & Nordstokke, 2019). Similarly, college students show higher levels of anxiety than non-college students (Wilcox & Nordstokke, 2019), and LGBT students also show higher levels of anxiety than heterosexual students (Almeida et al., 2009; Oswalt & Wyatt, 2011; Crawford & Ridner, 2018). Additionally, sexual identity (LGBT status) has been shown to correlate with levels of anxiety (Barton & Bulmer, 2017). Wilcox and Nordstokke (2019) found that anxiety levels were predictive of student academic success as measured by self-reported GPA. This can be cause for

concern in academic settings, as the purpose of academics is to learn. As with depression, however, anxiety has been extensively studied.

Similar to depression, anxiety contains multiple possible diagnoses in the DSM-5 (American Psychiatric Association, 2013). Anxiety disorders all contain exhibition of fear or anxiety responses; fear is in response to real or perceived immediate threat, whereas anxiety is in response to real or perceived future threat (American Psychiatric Association, 2013). Fear or anxiety responses can be extremely disrupting to the individual, often taking up a significant amount of their mental and emotional processing. For LGBT college students, anxiety responses could be in anticipation of possible discrimination or heterosexist bullying. This anxious anticipation could potentially engage the students' mental and emotional processes to the extent that they have reduced ability to focus on their studies, thus possibly affecting their academic success and leading to more mental health concerns.

Stress

Stress can have a large impact on a student's mental health. LGBT students are no exception; both heterosexual and LGBT students have similar stressors, though certain stressors may have more impact on one group than the other. Alessi et al. (2017) suggested that first-year LGBT college students experience higher stress in correlation with harassment, rejection, stigma, and other stressors. Such stressors correlate with increased instances of depression and anxiety diagnoses (Alessi et al., 2017; Almeida et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011), which in turn correlates with lower academic achievement and/or lower self-reported GPA (Schmitt et al., 2014).

Salfas et al. (2019) suggested that LGBT community involvement (e.g., attending LGBT events, such as pride parades, or socializing with one's local LGBT community, such as by going to a gay bar) can moderate the effect of stress in gay and bisexual men by reducing their stress levels. This suggests that although high stress can easily occur, it can also be mitigated by other environmental factors. However, if left unchecked, high levels of stress can lead to further mental health concerns.

Stress, when occurring in high enough levels, can lead to mental health disorders such as Post Traumatic Stress Disorder (PTSD), Acute Stress Disorder (ASD), or Adjustment Disorders (AD) (American Psychiatric Association, 2013). PTSD and ASD are more likely to occur as a result of discriminatory acts, while AD is possible based on the individual. AD is characterized by distress or significant impairment in social, occupational, or other functioning contexts (American Psychiatric Association, 2013). Adjustment Disorders could occur in relation to the individual experiencing significant stress related to their LGBT identity, or anxiety about possible discrimination. Such disorders can lead to a decreased life satisfaction and lower satisfaction with an individual's basic psychological needs.

LGBT Status and Outness

LGBT Status

LGBT status comes with its own potential problems. Examples of these potential problems are the possibility of stigma, prejudice, discrimination, and rejection by friends or family members (Alessi et al., 2017). Issues such as these correlate with increased instances of depression and anxiety disorders, and increased stress levels in LGBT

individuals (Alessi et al., 2017; Almeida et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011). For LGBT college students, there is also an increased risk of depression, anxiety, and stress, correlating with the challenges of adjusting to college and life on one's own when compared to heterosexual college students (Schmidt, Miles, & Welsh, 2011). Increased depression, anxiety, and stress can be cause for concern for many LGBT college students and can influence whether the individual decides to be open about their LGBT status.

Outness

Being open with others about one's LGBT status is often a decision that contains multiple factors and a large amount of thought and time. Outness is a term that refers to an LGBT individual's level of openness about their LGBT status to the other people in their life (Dentato et al., 2014). Multiple factors may influence an LGBT individual's desire to be open about their LGBT identity, such as the student's level of comfort with their local community or family (Dentato et al., 2014), religiosity of their local community (Sanabria, 2012), or community prejudice or discrimination towards the LGBT community (Abreu & Kenny, 2018; Mathies et al., 2019; Nadal et al., 2011; Woodford et al., 2012). Often outness is related to higher levels of self-esteem and lower levels of depression, but also to greater risk of discrimination (Kosciw et al, 2015). Additionally, outness shows a positive correlation with GPA via higher self-esteem and lower depression (Kosciw et al, 2015), with being completely out to everyone showing the strongest correlation between level of outness and GPA (Watson et al., 2015). While there are many potential challenges and risks involve with outing oneself, there are also

many advantages. One such advantage is a sense of autonomy, self-esteem, and self-efficacy, which can lead to improvements in academic achievement and self-reported GPA.

Grade Point Average (GPA)

GPA, or grade point average, is a number, often between zero and four, that identifies a student's average grade over the course of their studies. Each letter grade is assigned a number, then these numbers are averaged out to produce the student's GPA. GPA is often used as an identifier of student academic achievement, showing in a simple number how well they perform in school for a grade.

In addition to discrimination; depression, anxiety, and stress; and level of outness, multiple other factors can influence GPA. Some examples are physical activity (Weston et al., 2020), amount of time spent on a degree program (Brugiavini et al., 2020), emotional intelligence (Costa & Faria, 2020), family background (Huong et al., 2019), and more. With so many factors influencing GPA outcomes, it can be difficult to pinpoint one or two specific factors that contribute more than the others to a student's GPA. Thus, multiple studies must be conducted to consider the full influence of each factor individually.

Synthesis of the Literature

When considering LGBT college students and self-reported GPA, there are many factors that must be given attention. LGBT students can be a prime target for discrimination (Almeida et al., 2009; Kosciw et al., 2013; Mathies, et al., 2019; Nadal, et al., 2011; Schmitt et al., 2014), which in turn can influence depression (Almeida et al.,

2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011), anxiety (Almeida, et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011; Wilcox & Nordstokke, 2019), and stress levels (Alessi, et al., 2017; Almeida, et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011; Salfas et al., 2019; Schmitt, et al., 2014). These in turn, along with various other factors, can influence an LGBT student's decision to be open about their LGBT identity (Almeida et al., 2009; Dentato et al., 2014; Garvey et al., 2018; Oswalt & Wyatt, 2011; Sanabria, 2012). These factors taken both separately and together show a trend that negatively influences LGBT students' self-reported GPA (Brandao et al., 2017; Garvey et al., 2018; Kosciw et al., 2015; Kosciw et al., 2013; Mathies, et al., 2019; Oswalt & Wyatt, 2011). However, LGBT students also have unique factors that help to mitigate this negative trend when they do make the decision to out themselves and be open about their LGBT identity (Kosciw et al., 2015; Watson et al., 2015). This suggests that LGBT students face both unique challenges and unique benefits that influence their academic achievement and self-reported GPA. What remains, then, is to research these and other variables related to LGBT student academic achievement and self-reported GPA in ways that will benefit the students and their ability to learn effectively.

Methodological Critique

Many of the literature reviewed in this chapter utilized correlational analysis and descriptive statistics to analyze the data (Almeida et al., 2009; Dentato et al., 2014; Ellis, 2009; Garvey et al., 2017; Garvey et al., 2018; Garvey et al., 2015; Hartley, 2011; Kosciw et al., 2013; Kosciwet al., 2015; Oswalt & Wyatt, 2011; Sanabria, 2012; Woodford et al., 2012). Some studies utilized multiple regression models (Brandao et al.,

2017; Schmidt et al., 2011; Tetreault et al., 2013), and a few utilized between-group analysis (Brown et al, 2004; Schmitt et al., 2014). While useful in understanding some about the relationship between two variables, correlational analyses fail to capture the whole story, and often can lead to misinterpretation of the data. That is, many people tend to assume that a positive correlation means that variable A causes variable B. However, correlation only states that the two variables seem to rise and fall alongside each other. Only so much can be learned from such an analysis. Between-group analyses can show a different story, suggesting how various groups (e.g., LGBT versus heterosexual/cis gender) perceive things differently or similarly. Such an analysis can provide more information than correlational analyses, but still fail to capture certain pieces of information that may provide further insight into the question being asked. Finally, hierarchical linear regression models are useful for predicting an outcome and understanding the general relationship between multiple variables and an outcome variable. Hierarchical linear regression analyses can also provide some insight into the relationship between variables, thus lending a little more information to the question. Overall, the type of analysis used depends on the question being asked and the intended discovery of the research. While no type of analysis is necessarily bad, each lends different information to the research, and one or another may present exactly the information being sought better than a different analysis would.

Summary

Learning is an integral aspect of higher education, and it is important for students to have the best possible opportunities for academic success. LGBT college students face

unique challenges that may impact their ability to learn and their self-reported GPA. Such challenges as considered in this study were discrimination (Abreu & Kenny, 2018; Clark, 2014; Crisp & Turner, 2010; Mathies, et al., 2019; Nadal, et al., 2011; Silverschanz, et al., 2008), depression (Almeida, et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011), anxiety (Almeida, et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011; Wilcox & Nordstokke, 2019), stress (Alessi, et al., 2017; Almeida, et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011; Salfas et al., 2019; Schmitt, et al., 2014), and level of outness (Abreu & Kenny, 2018; Dentato, et al., 2014; Kosciw et al., 2015; Mathies, et al., 2019; Nadal, et al., 2011; Sanabria, 2012; Watson et al., 2015; Woodford et al., 2012). BPNT, a micro theory of SDT, was used to provide a framework from which to help understand motivational factors that then allow campus climate, depression, anxiety and stress levels, and level of outness to predict student self-reported GPA. Each study contributed its own unique consideration of various aspects of LGBT students' campus life.

The studies reviewed in this chapter revealed an interesting trend of information related to LGBT college students. First, it was suggested that discrimination seems to influence mental and behavioral issues, such as depression and anxiety, in LGBT students (Almeida et al., 2009; Schmidt, Miles, & Welsh, 2011; Woodford et al., 2012). Second, the literature suggests that depression and anxiety show more influence on student GPA than the other variables considered (Almeida et al., 2009; Crawford & Ridner, 2018; Oswalt & Wyatt, 2011; Wilcox & Nordstokke, 2019). While discrimination, religious influences, and level of outness do appear to play a role in student GPA, that role seems

to be more oriented towards influencing depression and anxiety levels as opposed to directly influencing GPA (Almeida et al., 2009; Dentato et al., 2014; Garvey et al., 2018; Oswalt & Wyatt, 2011; Sanabria, 2012). What the literature did not reveal was the influence of various factors (e.g., depression, anxiety, campus climate, and level of outness) in conjunction with each other on student GPA, nor did the literature reveal much about these factors' relationship to each other.

The current literature had not yet investigated campus climate, DASL, and level of outness together to predict student self-reported GPA. Therefore, this study sought to fill this gap by providing insight into these predictor variables and their relationship to the criterion variable. The following chapter reviews the methods used to accomplish this goal.

Chapter 3: Research Method

The purpose of this study was to explore the relationship between the predictor variables campus climate for LGBT college students, student level of outness and student DASL, and the criterion variable of student self-reported GPA. The previous chapter reviewed the literature available on each predictor variable in relation to the criterion variable. The available research was found to be lacking an investigation of these predictor variables taken together to predict the criterion variable; thus this current study sought to fill the void left in the available literature. The current chapter reviews the research design and rationale; methodology in terms of population, sampling and sampling procedures; recruitment procedures and data collection; instrumentation and operationalization of constructs; reliability and validity of the study; data analysis plan; threats to validity; and ethical concerns.

Research Design and Rationale

The predcitor variables for this study were campus limate, DASL, and level of outness. The criterion variable was self-reported GPA. The variables were tested through the use of a hierarchical regression analysis. This design allowed for a more complete understanding of factors that affect LGBT students' grade point average, and may help provide schools and students alike with possible strategies that may benefit the students in terms of academic success. The time constraints were limited by how long it takes participants to respond to the surveys used for the study. This was anticipated to take no more than approximately 15 minutes. Resources needed were access to the internet via a computer, tablet, or smart phone.

Methodology

Population

The population was LGBT college students at a public online university in the United States using the school's participant pool. Additional data was collected through a post on various LGBT college student groups on the social media platform Facebook, and through a post on Amazon MTurk. The population of all public college or university students was estimated to be 14.53 million in 2018 (Duffin, 2020). According to PNPI (2018), approximately 10% of college students identified as LGBTQ+. This puts the target population at approximately 1.453 million LGBT students.

Sampling and Sampling Procedures

The sampling strategy was a combination of convenience sampling, voluntary response sampling, and purposive sampling (McCombes, 2019). The surveys were sent out via a listing on the university's participant pool website to all students enrolled at a United States public university, a post requesting participation on various LGBT college student groups on Facebook, and a post requesting participation on Amazon Mturk (convenience), then the responses from students who identify as LGBT were used for the data (voluntary/purposive). This strategy allowed for purposful sampling while ensuring criteria for the data collection were met.

Use of G*Power 3.1.9.4 (see Buchner et al., 2019), with a moderate effect size of .15, alpha level at .05, power level at .95, and tested predictors set at three, revealed a necessary 119 sample size. This study sought to gather 125 from 131 responses. This was a 5 – 10% increase to account for missing or incomplete data.

A listing was posted on the university's participant pool website requesting student participation, on various LGBT student groups on the social media platform Facebook, and on Amazon Mturk. No participant information was known to me for this study. A link to an external source, SurveyMonkey, was provided in the participant pool listing, in the Facebook post, and in the Amazon MTurk post. The link took participants to the informed consent page, and upon agreement to the informed consent, the participants moved on to the questions for the survey. The results were subsequently saved in a special folder on a password protected flash drive. The data was then transferred to SPSS for statistical analysis. The results were saved to the same password protected flash drive in a separate folder.

Instrumentation and Operationalization of Constructs

Three instruments were used for this study: the lesbian, gay, bisexual, and transgendered climate inventory (LGBTCI; Liddle et al., 2004), the 14-item Depression Anxiety Stress Scales (DASS-14; Wise et al., 2017), and the Outness Inventory (Mohr & Fassinger, 2000). Permissions for use of the scales can be found in Appendix A, and the scale items can be found in Appendix B.

The LGBTCI (Liddle et al., 2004) measures the variable campus climate. This instrument measures 20 items on a four-point likert scale ranging from 1 (*doesn't describe at all*) to 4 (*describes extremely well*). The scale makes statements related to workplace climate for LGBT individuals, rating such things as the need for secrecy (Question 2), oppressive atmosphere (Question 6), presence of anti-LGBT hostility (Question 15) (Liddle et al., 2004). For this scale to fit with the present study,

"workplace" related words were altered to "college campus" related words. This minor change in wording was not expected to reduce the existing measures of validity. Reliability was tested with cronbach's alpha at 0.96, guttman split-half reliability at 0.97, Pearson's r correlations between 0.58 and 0.88 (median 0.72), and test-retest reliability at 0.87 (Liddle et al., 2004). Construct validity was measured against two existing scales: the Minnesota Satisfaction Questionnaire – short-form, correlation 0.58, and the LGB Workplace Discrimination Survey, correlation -0.52 (Liddle et al., 2004). The negative correlation with the LGB Workplace Discrimination Survey was due to the variation in questions. The LGBTCI contains questions presented in a positive format, whereas the LGB Workplace Discrimination Survey questions are presented in a more negative format. Additionally, the Minnesota Satisfaction Questionnaire contains questions in a positive format, thus explaining the positive correlation with the LGBTCI.

The DASS-14 contains 14 items requesting the participant to rate the applicability of each item to themselves over the past week on a 4-point Likert scale ranging from "*did not apply to me at all*" to "*applied to me very much, or most of the time*" (Wise et al., 2017a). The items are related to depression, anxiety, and stress. The scale showed internal consistency reliability with alpha = 0.88 for the depression subscale, alpha = 0.84 for the stress subscale, and alpha = 0.73 for the anxiety subscale. Internal consistency for the total scale showed alpha = 0.91. Factor analysis was conducted to test construct validity which showed the depression, anxiety, and stress factors accounting for 62.56% of the variance between items. Another factor, general distress, accounted for 71.23% of the variance between subscales.

The Outness Inventory contains 11 items on which the participant rates the extent to which specific people, or groups of people, are aware of their LGBT status (Mohr & Fassinger, 2000). The items are rated on a 7-point Likert scale ranging from 1 (*person definitely does not know about your LGBT status*) to 7 (*person definitely knows about your LGBT status, and it is openly talked about*). An additional response option (0) was added for not applicable situations where the individual(s) discussed did not exist in the participant's life. The test was created to test the degree to which lesbian women's and gay men's sexual orientation was known and/or openly discussed with various people in the individual's community (Mohr & Fassinger, 2000). The test contains three subscales: (a) "out to family" in which the extent to which the individual is open about their sexual orientation with family members is measured, (b) "out to world" in which the extent to which the individual is open about their sexual orientation with the general public and friends is measured, and (c) "out to religion" in which the extent to which the individual is open about their sexual orientation with their religious community is measured. Reliability was measured with alpha = 0.79 for the "out to world" subscale, alpha = 0.74 for the "out to family" subscale, and alpha = 0.97 for the "out to religion" subscale (Mohr & Fassinger, 2000).

The outness inventory has been modifed to allow for "LGBT identity" in place of "sexual orientation" and to remove the "out to religion" subscale for studies in which religion is not a factor (Resnick & Galupo, 2019). The original creator of the inventory gave permission to make minor adjustments to the inventory to account for testing slightly different populations, such as those without religious influence and LGBT

identities other than simply sexual orientation (see Mohr & Fassinger, 2000). Additionally, this was not expected to affect the reliability or validity of the instrument.

Data Analysis Plan

Research Questions and Hypotheses

Data analyses were performed to test both the null and alternative hypotheses for each research question:

$H_0$1: Campus climate does not significantly predict student self-reported GPA, when level of outness and DASL are accounted for.

$H_1$1: Campus climate significantly predicts student self-reported GPA, when level of outness and DASL are accounted for.

Research Question 2 (RQ2): Quantitative: Does student level of outness significantly predict self-reported GPA when campus climate and DASL are accounted for?

$H_0$2: Student level of outness does not significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

$H_1$2: Student level of outness does significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

Research Question 3 (RQ3): Quantitative: Does students' DASL significantly predict self-reported GPA when campus climate and level of outness are accounted for?

$H_0$3: Student DASL does not significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

$H_1$3: Student DASL does significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

Analysis

The data were analyzed using version 28 of IBM SPSS statistical software for windows computers. The data were screened for certain required demographics, specifically identity as LGBT, and completeness. Incomplete data and data indicating that the participant does not identify as LGBT were removed. The data was coded appropriately for each scale, using Likert scales indicating participant responses. The data was then entered into SPSS. Prior to running the planned hierarchical regression analyses, the scale scores were computed and evaluated with respect to assumptions of the hierarchical linear regression: multivariate normality; no multicollinearity; and homoscedasticity.

After screening the data, a hierarchical linear regression was conducted for each of the research questions to test each hypothesis. Hierarchical linear regression analyses are used when the researcher is testing multiple predictors variables in their relationship to a single criterion variable. Additionally, hierarchical linear regression analyses allow for (a) removing/accounting for one or more variables to test each independent variable individually and (b) correlational analysis between predictor variables.

Threats to Validity

External Validity

The main threat to the external validity of this study was generalizability. Since this study was conducted at a public online university in the United States, through the

social media platrorm Facebook, and through Amazon MTurk, the sample was only reflective of individuals attending the university at which the study was conducted, the various LGBT college students who are involved in the Facebook groups where the survey link was posted, and students who respond to surveys via Amazon MTurk. There are multiple regions and school types within the United States, and thus the sample may not have been representative of the entire population.

Internal Validity

The main threat to internal validity for this study was the possibility of confounding variables. One such variable has been considered, self-esteem, as possibly skewing results in the predictor variable "level of outness". However, this variable was believed to not hinder the current investigation as research suggests there is not a significant correlation between self-esteem and level of outness (Bosker, 2004). Additional variables may affect the criterion variable, but have not been considered.

Reliability and Validity of Measures

Each scale used for this study has reported reliability and validity statistics. This section will detail the reliability and validity statistics listed for each measurement.

For the LGBTCI, reliability was tested with cronbach's alpha at 0.96, guttman split-half reliability at 0.97, Pearson's *r* correlations between 0.58 and 0.88 (median 0.72), and test-retest reliability at 0.87 (Liddle et al., 2004). Construct validity was measured against two existing scales: the Minnesota Satisfaction Questionnaire – short-form, correlation 0.58, and the LGB Workplace Discrimination Survey, correlation -0.52 (Liddle et al., 2004). The negative correlation with the LGB Workplace Discrimination

Survey is due to the variation in questions. The LGBTCI contains questions presented in a positive format, whereas the LGB Workplace Discrimination Survey questions are presented in a more negative format. Additionally, the Minnesota Satisfaction Questionnaire contains questions in a positive format, thus explaining the positive correlation with the LGBTCI.

The DASS-14 was developed to improve the construct validity and reliability of the DASS-21 (21-item Depression Anxiety Stress Scales) to provide better mental health care for mental health patients (Wise et al., 2017b). It was tested on a cohort of Australian mental health professionals. The scale showed internal consistency reliability with alpha = 0.88 for the depression subscale, alpha = 0.84 for the stress subscale, and alpha = 0.73 for the anxiety subscale. Internal consistency for the total scale showed alpha = 0.91. Factor analysis was conducted to test construct validity which showed the depression, anxiety, and stress factors accounting for 62.56% of the variance between items. Another factor, general distress, accounted for 71.23% of the variance between subscales.

The modified version of the Outness Inventory showed internal consistency of alpha = 0.81 for “out to world” and alpha = 0.87 for “out to family”. This was an acceptable level of internal consistency, and suggested that the items in the test are valid and consistently measured what was intended.

Ethical Procedures

Procedures were in place to ensure the ethical conduct of this study. Rigorous IRB approval was met (approval number: 07 01 21 0595580**)**, participants were provided with

an informed consent document prior to participation in the study, participants were provided counseling resources (a phone number for counseling services available at their institution) should mental or emotional distress have occurred as a result of the study, and procedures were implemented to reduce or negate the following negative consequences of participating in this study: the possibility of mental/emotional distress as a result from remembered bullying or discrimination, mental/emotional distress related to the individual's LGBT identity, and the possibility of unintentionally being outed. Additionally, all data obtained from this study was anonymous, and were kept confidential on an enrypted USB flash drive. Finally, following participation in the study, participants were debriefed. This debriefing included a full description of the study and the hypotheses, specific resources in which the individual could seek counseling if they felt they had been mentally or emotionally harmed during the course of their participation, and a reiteration that all results were kept confidential and anonymous.

Summary

This study utilized a hierarchical linear regression analysis to analyze the data collected. This analysis was identified as being the best statistical method to test the hypotheses of this study. Data was collected from LGBT students at a public college or university in the United States, through a post on various Facebook groups, and through a post on Amazon MTurk. This data was collected using three surveys: (a) LGBTCI (Liddle et al., 2004), (b) the DASS-14 (Wise et al., 2017a), and (c) the Outness Inventory (Mohr & Fassinger, 2000). Threats to the validity of the study included the possibility of generalizability, and the possibility of other variables explaining the results of the

criterion variable. Construct validity was expected to be high. Finally, this study underwent rigorous IRB approval and provided informed consent and resources for participants to ensure ethical completion of the study.

Chapter 4: Results

The purpose of this quantitative analysis was to measure the value of campus climate for LGBT college students, DASL, and level of outness for predicting self-reported GPA. Campus climate was measured using the LGBTCI, DASL was measured using the DASS-14, and Level of Outness was measured using the OI. The predictor variables were campus climate, DASL, and level of outness, and the criterion variable was self-reported GPA. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 28. Hierarchical linear regression was used to analyze the data to answer the following research questions:

Research Question 1 (RQ1): Quantitative: Does campus climate significantly predict student self-reported GPA when level of outness and DASL are accounted for?

$H_0$1: Campus climate does not significantly predict student self-reported GPA, when level of outness and DASL are accounted for.

$H_1$1: Campus climate significantly predicts student self-reported GPA, when level of outness and DASL are accounted for.

Research Question 2 (RQ2): Quantitative: Does student level of outness significantly predict self-reported GPA when campus climate and DASL are accounted for?

$H_0$2: Student level of outness does not significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

$H_1$2: Student level of outness does significantly predict student self-reported GPA, when campus climate and DASL are accounted for.

Research Question 3 (RQ3): Quantitative: Does students' DASL significantly predict self-reported GPA when campus climate and level of outness are accounted for?

$H_0$3: Student DASL does not significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

$H_1$3: Student DASL does significantly predict student self-reported GPA, when campus climate and level of outness are accounted for.

This chapter discusses the data collection procedures, the demographic characteristics of the sample, normality of the distributions, and the analysis of the hierarchical linear regression.

Data Collection

The data collection efforts began in August 2021 and were completed in September 2022. The data was collected according to the procedures indicated in the research proposal. Data collection posts included a link to Survey Monkey which contained the survey. IRB approval was granted on July 15, 2021. Following IRB approval, collection efforts began. A single, public university was contacted per initial IRB approval, however after 3 months of waiting no response was received. IRB reapproval for a change in data collection modality was then requested and approved on December 29, 2021. This allowed the study to be posted on an online university's participant pool website. After 5 more months, only 14 results had been collected. IRB approval was then requested for a change in data collection procedures to add in a posting on LGBT college student Facebook groups and was approved on May 6, 2022. This only netted one more result. Finally, IRB approval was sought for another change in data

collection methods to remove the original survey posts and instead post on Amazon MTurk. This was approved on August 23, 2022, and netted the remaining data needed for a total of 120 results.

Recruitment and Response Rates

The data was collected using three different modalities. First, the survey was posted to the online university's participant pool website. This netted 14 results, one of which was discarded for being incomplete. Second, the survey was posted to an LGBT college student Facebook group. This netted one additional result. Last, these two posts were closed, and the survey was posted to Amazon MTurk, which offered $2.50 compensation for completion of the survey. This resulted in 214 results, of which 106 were kept. The remaining 108 results were discarded due to incompleteness or inaccurate representation of the participant's GPA (e.g., reporting "80" as their GPA, or reporting the formula to find a GPA rather than reporting an actual GPA). GPA scores ranging from zero to five were kept in the data.

Demographic Characteristics

Data collection efforts resulted in 229 responses of which 108 were discarded due to incomplete data or inaccurate representation of the participant's GPA. This resulted in 120 results. Demographic information was only collected for LGBT identity and age to ensure participants were above 18 years for legal consent purposes. All participants were above 18 years of age. Of the 120 participants, 33 identified as gay, 57 as bisexual, 16 as lesbian, 8 as transgender, and 6 as queer. I assumed that participants who identified as

gay were male, and those who identified as lesbian were female. No other demographic information can be inferred. This information can be visualized in Table 1.

Table 1

*LGBT Identity Demographics of Participants (*N = *120)*

	Frequency	Percent	Valid Percent	Cumulative Percent
Gay	33	27.5	27.5	27.5
Bisexual	57	47.5	47.5	75.0
Lesbian	16	13.3	13.3	88.3
Transgender	8	6.7	6.7	95.0
Queer	6	5.0	5.0	100.0
Total	120	100.0	100.0	

External Validity of the Population Sample

The type of college (e.g., public, private, religiously affiliated, etc.) was not accounted for in this study. Thus, the results of this study may not be indicative of the actual population based on college type. However, The Amazon MTurk post identified three qualifiers prior to entering the survey: (a) must self-identify as LGBT+, (b) must be actively/currently attending a college as a student, and (c) must be 18+ years of age, the Facebook post was posted in an LGBT college student group, and the University participant pool reaches only college student. Thus, I assumed that the participants were all college students in the U.S., and as such the results may be generalized to the LGBT college student population in the U.S. Additionally, generalizability is limited to those

individuals who are likely to respond to surveys. Other factors may influence response rates and have not been accounted for, which limits generalizability.

Coding Procedures

Ordinal data was coded in SPSS prior to analysis. LGBT identity was coded as 1 = *gay*, 2 = *bisexual*, 3 = *lesbian*, 4 = *transgender*, and 5 = *queer*. Age was removed as this information was no longer needed.

The results of the DASS-14 were coded as 1 = *did not apply to me at all*; 2 = *applied to me to some degree, or some of the time*; 3 = *applied to me a considerable degree, or a good part of the time*; 4 = *applied to me very much, or all of the time*. A higher score indicated higher levels of depression, anxiety, and stress per the questions contained in the DASS-14. No questions were reverse coded, as all questions on this scale indicated higher levels of depression, anxiety, and stress.

The results of the LGBTCI were coded based on positively worded questions (Question Numbers 1, 3, 4, 5, 7, 11, 12, 14, 16, 17, 19, and 20) and negatively worded questions (Question Numbers 2, 6, 8, 9, 10, 13, 15, and 18). The positively worded questions were coded as 1 = *doesn't describe at all*, 2 = *describes somewhat or a little*, 3 = *describes pretty well*, and 4 = *describes extremely well*. The negatively worded questions were coded as 1 = *describes extremely well*, 2 = *describes pretty well*, 3 = *describes somewhat or a little*, and 4 = *doesn't describe at all*. This allowed the final score to indicate higher values as meaning a better campus climate.

The results of the OI were coded based on how much an individual knew about and talked about the participant's LGBT identity. This was coded as 1 = *person definitely*

does NOT know about your sexual orientation status; 2 = *person might know about your sexual orientation status, but it is NEVER talked about*; 3 = *person probably knows about your sexual orientation status, but it is NEVER talked about*; 4 = *person probably knows about your sexual orientation status, but it is RARELY talked about*; 5 = *person definitely knows about your sexual orientation status, but it is RARELY talked about*; 6 = *person definitely knows about your sexual orientation status, and it is SOMETIMES talked about*, and 7 = *person definitely knows about your sexual orientation status, and it is OPENLY talked about*. Specific items were indicated that "not applicable to your situation; there is no such person or group of people in your life". These items were removed to not interfere with the final score. A higher score indicated a higher level of outness. After all raw data scores were coded, means were taken for each participant for each scale (DASS-14, LGBTCI, and OI). These indicated the final score for each participant and were used as the variables for the final analysis.

Analysis of Normality and Outliers

The predictor variables and criterion variable were tested for distribution normality and outliers. Two variables showed outliers (campus climate and GPA). However, these values did not represent extreme outliers, and as such they were left as they were. The remaining variables (DASL and level of outness) contained no outliers.

The data was analyzed for skewness and kurtosis. *Z*-scores for all variables related to both skew and kurtosis were within the bounds of -1.96 to + 1.96 with one exception. The variable campus climate showed a *z*-score of 2.44, indicating leptokurtosis, which is above the bounds of a normal distribution. This indicates that the

majority of the data for the variable Campus Climate was grouped in the middle of the distribution, with larger tails than is seen in a normal distribution.

The Shapiro-Wilk test was used to further examine the normality of the predictor and criterion variables. Shapiro-Wilk revealed significant deviations from normality, for DASL, $W(120) = .977$, $p = .041$; for campus climate $W(120) = .961$, $p = .001$; for level of outness $W(120) = .972$, $p = .014$; and for GPA $W(120) = .942$, $p = <.001$. All scores show statistical significance, indicating that there was a discrepancy with the normality in all variables. According to Ghasemi and Zahediasl (2012), the Shapiro-Wilk normality test is best used with small sample sizes. Larger sample sizes tend to show significance even with small deviations from normalcy, and these small deviations are considered to not affect the results of a parametric test. Therefore, I determined that the significant result of the Shapiro-Wilk test would not affect the final analysis, as the skew and kurtosis coefficients showed normality in all variables except campus climate, and the total number of participants is considered large since the number of participants is above 50 (Glen, 2022; SPSS Toutorials, 2022). The discrepancies in normality can be visualized in Figures 1 through 4.

Figure 1

DASL Histogram

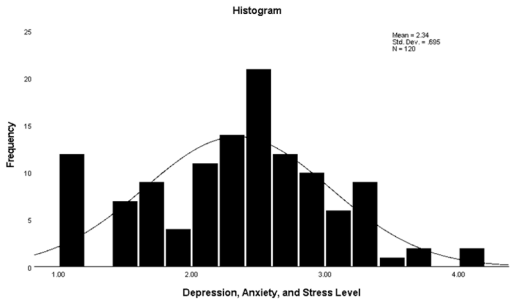


Figure 2

Campus Climate Histogram

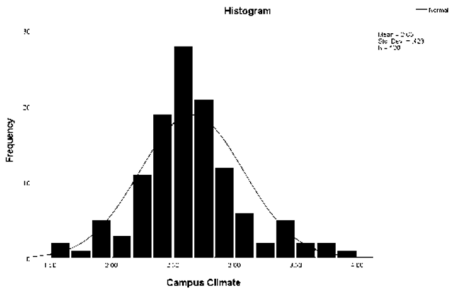


Figure 3

Level of Outness Histogram

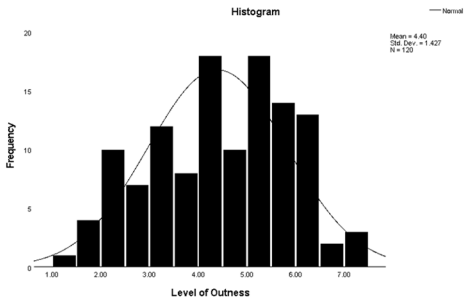
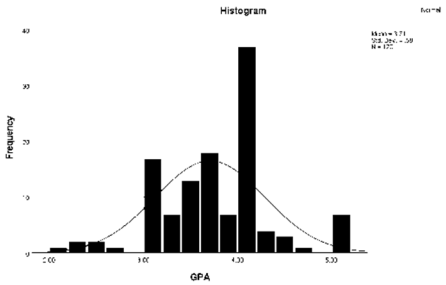


Figure 4

GPA Histogram



Analysis and Results

Hierarchical Linear Regression Analysis

A hierarchical linear regression analysis was used to test the research hypotheses. This statistical analysis shows how much a predictor variable accounts for the variance in the criterion variable when accounting for the remaining variables, based on one independent variable when other independent variables are accounted for (Kim, 2016). The results of this test show whether a significant amount of the variance in the criterion variable is explained by a specific predictor variable when all other predictor variables are accounted for.

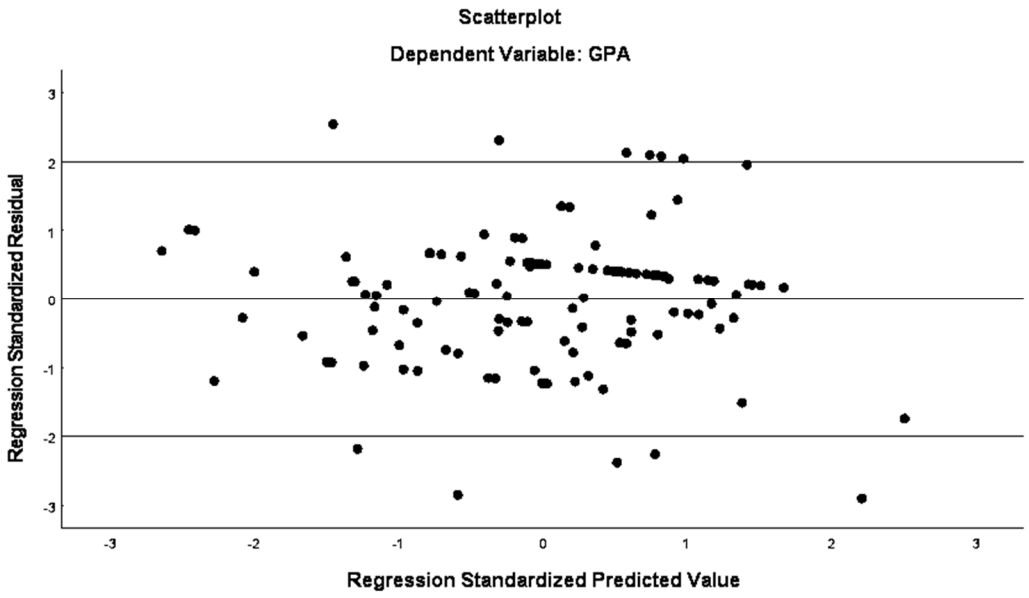
Assumptions

The variables were tested for the assumptions of a hierarchical linear regression analysis prior to analyzing the results. The sample size contained 120 results, which was well over the ideal of 20 results per criterion variable (Grande, 2015). The criterion variable GPA showed homoscedasticity, in that the standardized residuals were evenly distributed along the range of the predictor variable. A visual representation can be found in Graph 1. Autocorrelation was tested using a Durban-Watson analysis. The results

revealed a normal value, $DW = 1.75$. Influential outliers were tested using Cook's Distance. The results revealed no significant outliers, D_i (min) = .000, D_i (max) = .207, D_i (mean) = .011. Finally, Casewise Diagnostics was used to identify extreme outliers. The results revealed that 11 items fell outside of 2.00 standard deviations from the mean. These results were the same for all three analyses.

Figure 5

Homoscedasticity of GPA

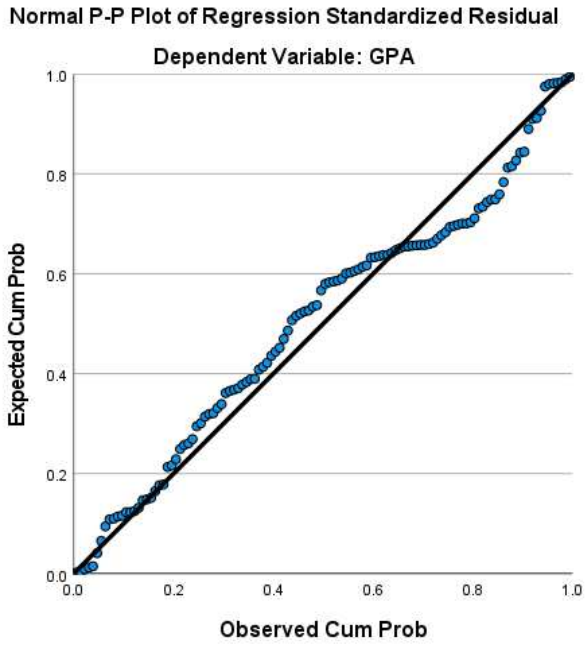


The assumption of linearity was also tested. A hierarchical linear regression analysis makes the assumption that all predictor variables will be significantly correlated with the criterion variable (Fein et al., 2022). The correlation model did not show significance for any predictor variables with the criterion variable. Table 2 provides details of the correlation analysis. However, a linearity scatterplot was additionally used to test the assumption that the predictor variables will be linearly related to the criterion

variable. The scatterplot shows that the assumption of linearity was met, as the data points generally follow the linearity line. A visual representation can be found in Graph 2.

Figure 6

Linearity of Predictor Variables to Criterion Variable



Finally, the assumption related to collinearity was tested. This assumption states that the predictor variables of a regression model will not be highly correlated with each other (Fein et al., 2022). A high correlation is denoted as containing a Pearson *r* above .80 (Field, 2009). All predictor variables had a correlation coefficient of < .50. campus climate showed a moderate positive correlation (r = .476) with level of outness and a low, negative correlation with DASL (r = -.201). Table 2 provides details of the correlation analysis. Furthermore, Field (2009) suggests that collinearity can be safely discounted with a Variance Inflation Factor (VIF) of less than 10. The predictor variables in this

study showed the following VIFs: campus climate *VIF* = 1.34, level of outness *VIF* = 1.29, and DASL *VIF* = 1.04. Thus, the assumption related to collinearity was met.

Table 2

*Correlational Analysis of Variables (*N = *120)*

Variables		GPA	Level of Outness	Campus Climate	Depression, Anxiety, and Stress Level
GPA	Pearson Correlation	1	-.131	-.074	.165
	Sig. (2-tailed)		.154	.424	.071
	N	120	120	120	120
Level of Outness	Pearson Correlation	-.131	1	.476**	-.086
	Sig. (2-tailed)	.154		<.001	.348
	N	.120	120	120	120
Campus Climate	Pearson Correlation	-.074	.476**	1	-.201*
	Sig. (2-tailed	.424	<.001		.027
	N	120	120	120	120
Depression, Anxiety, and Stress Level	Pearson Correlation	.165	-.086	-.201*	1
	Sig. (2-tailed	.071	.648	.027	
	N	120	120	120	120

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 1

A hierarchical linear regression was used to test the hypothesis that "campus climate significantly predicts student self-reported GPA, when level of outness and DASL are accounted for". The predictor variables level of outness and DASL were entered into the first block of the analysis, with GPA as the criterion. The results revealed that these predictor variables did not significantly predict GPA, $F(2, 117) = 2.5$, $p = .086$.

Additionally, the R^2 value of .041 indicates that level of outness and DASL account for 4.1% of the variation in GPA,

The predictor variable campus climate was included in the second block of the analysis, with GPA remaining the criterion variable. The results revealed that campus climate did not significantly predict GPA, $F(1, 116) = .029$, $p = .865$. The R^2 change value of .000 associated with this model indicates that the addition of campus climate accounts for 0% of the variance in GPA. This indicates that campus climate does not significantly predict GPA when level of outness and DASL are accounted for. Table 3 provides details of the hierarchical linear regression analysis.

Table 3

*Hierarchical Linear Regression Analysis for Hypothesis 1 (*N = *120)*

Model	*R*	*R* Square	Adjusted *R* Square	*R* Square Change	Sig. *F* Change
1[a]	.203	.041	.025	.041	.086
2[b]	.203	.041	.016	.000	.865

Note. The dependent variable was GPA.

[a] The predictors for Model 1 were (Constant), Depression, Anxiety, and Stress Level, and Level of Outness.

[b] The predictors for Model 2 were (Constant), Depression, Anxiety, and Stress Level, Level of Outness, and Campus Climate.

Hypothesis 2

A hierarchical linear regression was used to test the hypothesis that "student level of outness significantly predicts self-reported GPA when campus climate and DASL are accounted for". The predictor variables campus climate and DASL were entered into the

first block of the analysis, with GPA as the criterion. The results revealed that these predictor variables did not significantly predict GPA, $F(2, 117) = 1.751$, $p = .178$. Additionally, the R^2 value of .029 indicates that Campus Climate and DASL account for 2.9% of the variation in GPA.

The predictor variable Level of Outness was included in the second block of the analysis, with GPA remaining the criterion variable. The results revealed that level of outness did not significantly predict GPA, $F(1, 116) = 1.48$, $p = .226$. The R^2 change value of .012 associated with this model indicates that the addition of level of outness accounts for 1.2% of the variance in GPA. This indicates that level of outness does not significantly predict GPA when Campus Climate and DASL are accounted for. Table 4 provides details of the hierarchical linear regression analysis

Table 4

*Hierarchical Linear Regression Analysis for Hypothesis 2 (*N = *120)*

Model	*R*	*R* Square	Adjusted *R* Square	*R* Square Change	Sig. *F* Change
1[a]	.170	.029	.012	.029	.178
2[b]	.203	.041	.016	.012	.226

Note. The dependent variable was GPA.

[a] The predictors for Model 1 were (Constant), Depression, Anxiety, and Stress Level, and Campus Climate.

[b] The predictors for Model 2 were (Constant), Depression, Anxiety, and Stress Level, Campus Climate, and Level of Outness.

Hypothesis 3

A hierarchical linear regression was used to test the hypothesis that "students' DASL significantly predicts self-reported GPA when campus climate and level of outness are accounted for". The predictor variables campus climate and level of outness were entered into the first block of the analysis, with GPA as the criterion. The results revealed that these predictor variables did not significantly predict GPA, $F(2, 117) = 1.03$, $p = .360$. Additionally, the R^2 value of .001 indicates that Campus Climate and DASL account for 0.1% of the variation in GPA.

The predictor variable DASL was included in the second block of the analysis, with GPA remaining the criterion variable. The results revealed that DASL did not significantly predict GPA, $F(1, 116) = 2.90$, $p = .091$. The R^2 change value of .016 associated with this model indicates that the addition of level of outness accounts for 1.6% of the variance in GPA. This indicates that DASL does not significantly predict GPA when campus climate and level of outness are accounted for. Table 5 provides details of the hierarchical linear regression analysis.

Table 5

*Hierarchical Linear Regression Analysis for Hypothesis 3 (*N = *120)*

Model Summary

	R	*R* Square	Adjusted *R* Square	*R* Square Change	Sig. *F* Change
1[a]	.132	.017	.001	.017	.360
2[b]	.203	.041	.016	.024	.091

Note. The dependent variable was GPA.

[a] The predictors for Model 1 were (Constant), Campus Climate, Level of Outness.

[b] The predictors for Model 2 were (Constant), Campus Climate, Level of Outness, Depression, Anxiety, and Stress Level.

Summary

The purpose of this study was to understand the ability of campus climate, DASL, and level of outness to each predict GPA when each of the other two variables were accounted for. A hierarchical linear regression analysis was run for each of the three hypotheses. The results of the hierarchical linear regression analysis showed no significance for Hypothesis 1, indicating that campus climate does not predict GPA when DASL and level of outness are accounted for. The results of the hierarchical linear regression analysis showed no significance for Hypothesis 2, indicating that level of outness does not predict GPA when campus climate and DASL are accounted for. The results of the hierarchical linear regression analysis showed no significance for Hypothesis 3, indicating that DASL does not predict GPA when campus climate and level of outness are accounted for. Further interpretation of the results can be found in

Chapter 5. Limitations of the study, implications for social change, and suggestions for future research are also discussed.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to explore the relationship between the predictor variables campus climate, student level of outness and student DASL, and the criterion variable of student self-reported GPA. This study focused on LGBT college students and sought to understand variables that affected academic achievement as determined by self-reported GPA. This study was conducted because the available literature left a gap where the three predictor variables had not been considered together in terms of self-reported GPA. Each variable has been studied separately (Almeida et al., 2009; Bosker, 2004; Brandao et al., 2017; Brown et al., 2004), but they had not yet been studied together. This study sought to fill that gap.

Summary of the Findings

This study utilized a nonexperimental, quantitative design. A survey made up from three separate inventories (the DASS–14; the LGBTCI; and the OI) was posted in various locations online to gather participants. The data were analyzed using a hierarchical linear regression model to test each of the three research questions. None of the three tests significantly predicted GPA, failing to demonstrate that GPA was predicted based on campus climate when level of outness and DASL were accounted for, level of outness when campus climate and DASL were accounted for, or DASL when campus climate and level of outness were accounted for.

Interpretation of the Findings

Hypothesis 1

The results of the hierarchical linear regression analysis did not support the first hypothesis that campus climate would predict GPA when level of outness and DASL were accounted for. This is inconsistent with the expectations from prior studies relating campus climate to GPA. Previous research had indicated that campus climate has a positive relationship with GPA (Brown et al., 2004; Evans, 2002; Garvey et al., 2017; Garvey et al., 2018; Kosciw et al., 2013; Mathies et al., 2019; Saenz et al., 1999). Based on the past research, I expected that campus climate would at least partially predict GPA, but this was not found.

Hypothesis 2

The results of the hierarchical linear regression analysis did not support the second hypothesis that level of outness would predict GPA when campus climate and DASL were accounted for. This is inconsistent with the expectations from prior studies relating outness to GPA. Previous research suggests that LGBT students who are more open about their LGBT identity tend to perform better academically (Kosciw et al., 2015; Watson et al., 2015). Therefore, I expected that level of outness would at least partially predict academic achievement, but this was not found.

Hypothesis 3

The results of the hierarchical linear regression analysis did not support the third hypothesis that DASL would predict GPA when campus climate and level of outness were accounted for. This is inconsistent with the expectations from prior studies relating

depression, anxiety, and stress to GPA. Prior research has found that higher levels of depression, anxiety, and/or stress negatively correlate with academic achievement (Brandao et al., 2017). Therefore, it was expected that higher levels of DASL would predict lower GPA, but this was not found.

Possible Confounding Effects

This study did not account for school type (e.g. community college, public university, online university, private and/or religious college, etc.) or self-esteem. Research suggests that both of these variables may have an impact on student academic achievement (Park & Maner, 2009; Rockenbach & Crandall, 2016; Taylor, et al., 2020). Additionally, resilliancy has been shown to play a role in LGBT college student's academic achievement, and this was not accounted for in this study (Hartley, 2011; Kosciw et al., 2015). Additionally, religiosity of the school has been shown to impact LGBT students' college experience (Rockenbach & Crandall, 2016; Sanabria, 2012; Wolff et al., 2017; Worthen et al., 2017), but religiosity was not accounted for in this study.

Theoretical Interpretation

This study utilized the BPNT – a micro-theory contained in SDT (Deci & Ryan, 2008b). BPNT suggests that the basic psychological needs of autonomy, competance, and relatedness are necessary for an individual to have the motivation to accomplish goals, such as achieving a high GPA (Deci & Ryan, 2002; Deci & Ryan, 2012). The findings of this study suggest that campus climate, level of outness, and DASL are not enough to reduce or improve student motivation sufficiently to impact GPA. It is possible that other

factors such as self-esteem, resilience, are having a negation effect on the impact of the variables considered in this study.

Limitations

This study contained some limitations. First, the results may not be representative of the entire LGBT college student population. This study did not account for school type, region of the country, or other demographic factors. Thus, the results are only generalizable to those students attending the online university surveyed, students who are active on LGBT Facebook groups, and students who utilize Amazon Mturk, and may not be indicative of specific populations within the larger population.

Second, this study did not account for religiosity, resiliency, or self-esteem. These are possible confounding variables that may have impacted the results. These variables may have skewed the results or may have had a mitigating effect on the variables that were included. For example, although prior research does not indicate a correlation between self-esteem and level of outness (Bosker, 2004), it is possible that self-esteem may affect DASL or perceptions of campus climate.

Finally, the sampling methods were not optimal for ensuring an accurate sample representative of the population. A convenience sampling method was primarily used to gather the data, and purposive sampling was only implemented to ensure that participants identified as LGBT and were of legal age of informed consent (18 +). It is possible that there are differences between those who chose to participate and those who did not that might have skewed the results. This also relates to generalizability, as participation was not controlled to the point of ensuring a diverse, representative sample.

Recommendations for Future Research

Based on the conclusions and limitations of this study, further research is needed to understand predictors of LGBT college students' academic achievement. Future research could conduct the study in-person at one or more school types. This would introduce school type as a factor that may influence the results and would improve the generalizability of the study. Additionally, future research could include alternative variables, such as religiosity, self-esteem, and resiliency. This would account for factors not considered in this study. Finally, future research could include more demographic characteristics, which would improve the generalizability of the study.

Implications for Social Change

Considering the inconclusive results of this study, implications for positive social change are limited. Further research is necessary to fully understand the factors that help to predict LGBT student GPA. However, this study can still bring to light issues and mental health factors that can affect LGBT college students. With the proper permissions, colleges and universities can utilize the DASS-14 found in this study to better understand the mental health state of the students attending. Implications of prior research discussed in this study can influence colleges and universities to improve their campus climate for LGBT students by providing them with social support and mental health resources. Finally, the results of this study can influence colleges and universities to consider and study the factors that may predict or influence their students' GPAs, which in turn could lead to more students succeeding academically.

Conclusion

This study sought to explore factors that may predict LGBT college students' academic achievement as indicated by self-reported GPA. The hypotheses of this study were not supported. However, this study provided the basis for future research to build upon to continue exploring factors that can predict or influence academic achievement. Additionally, this study identified factors that may influence LGBT students' college experiences and provided a basis for colleges and universities to consider research and resources to aid this population of college students in their academic careers.

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Appendix A: Permissions for use of Measures

DASS-14

Hello,

My name is Jonathan McCormick, and I am a doctoral student with Walden University. I am working on my dissertation in which I will be studying various factors that influence academic achievement for LGBT college students. One of these factors will be depression and anxiety. I found your Depression Anxiety Stress Scale via PsycTESTS while looking for a survey for this item, and I was wondering if I could have your permission to utilize this scale for my dissertation research?

Thank you for your consideration,

Jonathan McCormick

Hi Jonathan, thanks for your email. You are very welcome to use the DASS-14.

Good luck with your doctoral studies - let me know how you go!

Best regards, Frances

Dr Frances Wise

MBBS PhD(Melb) FAFRM(RACP)

Senior Rehabilitation Physician

Cardiac Rehabilitation Unit

Caulfield Hospital

Adjunct Senior Lecturer/Senior Research Associate

Monash University/Epworth Monash Rehabilitation Medicine Unit

Lesbian, Gay, Bisexual, and Transgendered Climate Inventory (LGBTCI)

Source: Liddle, Becky J., Luzzo, Darrell Anthony, Hauenstein, Anita L., & Schuck, Kelly. (2004). Construction and Validation of the Lesbian, Gay, Bisexual, and Transgendered Climate Inventory. Journal of Career Assessment, Vol 12(1), 33-50. doi: https://dx.doi.org/10.1177/1069072703257722, © 2004 by SAGE Publications. Reproduced by Permission of SAGE Publications

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Outness Inventory

December 11, 2011

Dear Researcher,

Thank you for your interest in the Outness Inventory. The scale was published in a scientific journal for use in the public domain. You do not need to contact any of the authors for permission to use this scale in noncommercial research. You may not use the scale for commercial purposes without permission.

The following pages contain the scale itself, as well as basic information about the scale. If you have questions or concerns about the scale that are not addressed in these pages, then feel free to contact me using the contact information below. Best wishes with your research!

Sincerely,

Jonathan Mohr

Assistant Professor

Counseling Psychology Program

Department of Psychology