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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

WITH A LITTLE HELP FROM MY FRIENDS: DETERMINING
THE ROLE OF PHYSICAL ACTIVITY AND BELONGING IN
RETENTION OF FIRST-YEAR UNIVERSITY STUDENTS

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science

Bryson Manning Kelly

Natural and Health Sciences
School of Sport and Exercise Science
Social Psychology of Sport and Physical Activity

December 2020

This Thesis by: Bryson Manning Kelly

Entitled: With a little help from my friends: *Determining the role of physical activity and belonging in retention of first-year university students*

has been approved as meeting the requirement for the Degree of Master of Science in College of Natural and Health Sciences in School of Sport and Exercise Science, Program of Social Psychology of Sport and Physical Activity.

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ABSTRACT

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There exists an issue facing colleges and universities across the United States. Roughly 29% of first-year students do not return for their second year of school. Previous research has shown a significant relationship between a student's sense of belonging or fit within the university and their decision to continue enrollment (retention). Physical activity has also been shown to have a significant relationship with a sense of belonging. Therefore, the purpose of the present study was to determine if physical activity and sense of belonging predict retention of university students from their first year to their second year using a Relationships Motivation Theory framework (Ryan & Deci, 2017). Participants included in the study were 310 first-year university students (77.1% female, 22.9% male; $M = 19.18$ years, $SD = 1.11$ years). Results indicated no significant relationship between physical activity and belonging. Two logistic regression models were deployed, and results indicated 'integration' as a significant predictor of retention in the first model and 'integration', 'connectedness to student community', GPA and Gender as significant predictors in the second model. Results confirm prior research of belonging serving as a significant predictor of retention while providing a new framework to study university student retention.

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CHAPTER I

INTRODUCTION

Higher education institutions in the United States (U.S.) continue to see declining enrollment trends and disheartening retention rates of their first-year students. Roughly, 29% of first-year students at public, 4-year institutions do not return for the second year and that percentage increases to 36.7% when looking at those aged 20 years and younger. As for those who do not return for their second year broken down by ethnicity, 30% of White students, 32% of Hispanic students, and 36% of Black students do not return for their second year (National Student Clearinghouse Research Center, 2019). Along with the troublesome retention rates, universities across the nation are experiencing decreasing enrollment. From 2015 to 2019, 4-year public institutions have seen an overall 2% decrease in enrollment (National Student Clearinghouse Research Center, 2019). While this may not be a concerning enrollment drop right now, the Education Advisory Board (EAB) projects that high school graduates will decrease in the coming years and create a 15% decrease in enrollment between the years 2025 to 2029. (Education Advisory Board [EAB], 2019b). The EAB associates this change with the sharp decline in people having children after the Great Recession in 2008. (EAB, 2019a). With these decreasing enrollment trends and concerning retention rates, administrators are forced to act quickly and create initiatives around improving the retention of their first-year students. An understanding of what contributes to students' decisions to "drop out" is required before strategies can be developed and implemented. Tinto (2001) attributes the "drop out" of students to the lack of integration into the social and academic environments within a university. The

transition from high school to college can be challenging not only regarding a student's social life, but also because of the various demand students face in the classroom. This transition is even more difficult for students due to the lack of financial resources, unclear goals, academic struggles, less than ideal commitment and the mismatched "fit" within the university community or with college structure in general (Tinto, 2001). Tinto (2001) further describes these challenges as considerations universities need to think about when creating strategies to help support these students. Many students leave because they cannot afford to pay the direct/indirect costs and Tinto (2001) makes the argument that this is less about the actual cost, but more about the perceived value of the educational experience and cost associated with continued enrollment. Some students do not have the full commitment to continue enrollment; not because of their previous or current academic ability, but because of external commitments. It is quite often that students leave because of external commitments like family death/sickness or helping with a family run business. Others leave because they experience a lack of belonging on campus or in the classroom. They do not feel like they made the right choice, or the institution has failed them when it comes to the support and lack of a friendly culture or community (Tinto, 2001). This lack of a friendly culture or community may be due to social related issues and the lack of resources for all students. The key difference in those who leave because of value, those who leave due to "fit", and those who leave due to external commitments, is those who have external commitments may come back and continue after those situations have been resolved. Those who leave because of the lack of "fit" or the decrease in perceived value often will not return to the institution (Tinto, 2001).

The concept of "fit" can be especially crucial when searching for determinants of retention of first-year students because "fit" is beneficial when describing a student's sense of

belonging. Belonging is described as the sense a community a member feels which contributes to feeling like they matter and fit within the group (McMillan & Chavis, 1986). Furthermore, Self-Determination Theory (SDT, Ryan & Deci, 2017) provides a framework for which “fit” or belonging can potentially explain retention and the student’s motivation to continue attending a university/college. SDT contains three basic psychological needs that require being satisfied for an individual’s psychological well-being: Autonomy, Competence and Relatedness. These three components of SDT are required for self-regulation, internal regulation or motivation as well as an individual’s psychological well-being. SDT is comprised of six mini-theories. The mini theory focused on the quality of relationships and one’s belonging to a group is known as Relationship Motivation Theory (RMT, Ryan & Deci, 2017). RMT explains that a sense of belonging is essential for one’s well-being, motivation in, and adjustment to particular social contexts. If relatedness is high or met, autonomy and competence are also satisfied within the RMT framework (Ryan & Deci, 2017). Belonging may have a contribution to multiple domains including physical activity. Belonging has been shown to be satisfied and associated with high levels of physical activity in a study conducted by Bailey and McLaren (2005). Specifically, these researchers identified the impact physical activity alone and with others had on mental health and belonging in retirees with a mean age of 69.59 years ($SD = 6.64$ years) in men and 68.21 years ($SD = 7.78$ years) in females. Contrary to those findings, Fletcher (2016) assessed college student physical activity engagement and the motivational factors associated with (in)activity within the SDT framework. They found that college students tend to be more motivated through extrinsic factors instead of more autonomous means. (Fletcher, 2016). An understanding of college student physical activity behaviors is pertinent to examine the relationship high levels of physical activity have on a sense of belonging in that context.

Physical activity has been identified as an instrumental component in the prevention of diseases as well as the treatment for depression, sleep disorders, stress, anxiety, mood and other related mental health disorders (United States Department of Health and Human Services [USDHHS], 2018). Much of the recent conversation has been focused on the prevention and treatment of obesity in the United States due to the report that one-third of all the children born after the year 2000 have a higher chance of experiencing Type 2 diabetes in their life as well as the possibility of facing other chronic health diseases including high blood pressure, cardiovascular disease, asthma and cancer (USDHHS, 2018). This group of children are the ones who will be making this transition to college in the coming years and the clear benefits of physical activity could be a catalyst for change not only in their physiological health, but their psychological and social health. The life stage these children will be entering as they begin their university studies is the development stage Arnett (2000) defined as 'Emerging Adulthood'. This developmental stage is when many college/university students experience new areas of autonomy and freedom, but also have anxiety and concerns about the future, which can greatly impact their social and psychological health (Arnett, 2014).

The relationship between physical activity and positive psychological outcomes has been explored within social motivation and youth (Allen, 2003), belonging and mental health of retirees (Bailey & McLaren, 2005), motivation to exercise within college students (Ebben & Brudzynski, 2008; Quartiroli & Maeda, 2014; Horacek et al., 2018), perceived influence on physical activity behaviors (Harmon et al., 2016) and stress tolerance in college students (Bland et al., 2014). Further exploration is warranted to identify the relationship between physical activity behaviors, students' sense of belonging on a college campus and retention after the first year. Using the theoretical framework of Relationships Motivation Theory (Ryan & Deci, 2017)

mini theory of SDT, the aim of this study was to explore the relationship between belonging, physical activity and retention among first-year university students. The purpose of this study was to determine if physical activity and sense of belonging predict retention of university students from their first year to their second year.

- Q1 Does the amount of physical activity engagement contribute to sense of belonging among first-year university students?
- Q2 Do sense of belonging and amount of physical activity predict university students' retention from their first year to second year?

CHAPTER II

REVIEW OF LITERATURE

This next section will focus on a review of existing literature on consideration of college students as emerging adults, college student retention, sense of belonging, and physical activity behaviors.

University Students as Emerging Adults

Twenty-first century college students are experiencing a different college “life” than many of those who came before them. The average age of student’s pursuing college full-time in 4 -year public institutions is 21 years and 27.1 years for part-time students (National Student Clearinghouse Research Center, 2019). In the 1960’s and 70’s, a 21-year-old may have already been married (or in a long-term relationship), have a career, raising children or other milestones we would consider “adulthood” (Arnett, 2014). In 21st century society 18-29-year-olds are experiencing a freedom to pursue a variety of different paths and do not feel the need to “settle down” just yet (Arnett, 2014). Arnett (2000) spent much of his work researching individuals within this age range and found that many do not feel they have reached adulthood and others feel like they are beyond their time as adolescents. Therefore, the term for this group was not “early adulthood” or “late adolescence” but was labeled by Arnett (2000) as ‘emerging adulthood’. In their early twenties, this population has much excitement about the paths and opportunities ahead of them due to increased autonomy, but also feel anxiety about where their choices are going to lead them and what path is the right one (Arnett, 2014). This stage is when they develop the skills and obtain the necessary education to pursue their path, but it is also a

time to try different future paths through jobs, internships and other prospective opportunities. Not only are these experiences affecting their future career outlooks, they may be challenging their worldview, assisting in discovering love, and a key factor in developing health behaviors (Arnett, 2000). There are five key elements of ‘emerging adulthood’ mentioned in Arnett’s book *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties* (2014) and those are identity explorations, instability, self-focus, feeling in-between, and possibilities/optimism. It is pertinent to further explore these elements to understand the context in which college students exist and to understand more about their health-related behavior.

Identity exploration is seen as a definite part of emerging adults as they are discovering who they are and who they want to be. Many emerging adults are becoming separated from their parents both residentially and financially, so there is a sense of freedom in exploring within the areas of work, love and personality. Identity is not something that has been developed in its fullest but is continually developed through emerging adulthood. It is constantly being developed by experiences but is influenced by previous values and beliefs. Identity can be influenced by different roles the individual maintains and thus saliency will be given to those roles that help contribute the most to the maintenance of one’s identity (Stryker, 1968). These roles will change and therefore an individual’s identity will be changing and developing. Arnett (2014) also argued that identity formation increases in intensity within emerging adulthood, especially in the areas of work and love. In love, the identity formation changes questions from “Who would I like to be with in this moment?” to “Who am I as a person and who would be the best fit for a life-long partner?” (Arnett, 2014). With respect to work, the jobs adolescents tend to have are more part-time jobs that support the lifestyle of being social with friends and buying things like game tickets, fast-food meals, and clothing. These part-time jobs are not seen as ways in which skills

are developed for a transition into a career. That all changes in emerging adulthood and the jobs are thought as preparation for a career with the exploration existing around the paths that will lead to that chosen career.

Instability coincides with the previous section of identity exploration because with the exploration into one's identity comes a great amount of change. Arnett (2014) talks about a capital "P" Plan that is in constant development. This Plan is always in flux as an individual makes decisions that impact the direction of the Plan. When a student enters their first year of college, they are expected to select a major, but many change their major multiple times. Within their first three years of college, roughly 30% of students change their major at least once (National Center for Education Statistics [NCES], 2017). Changes in major are the highest in those who are enrolled within science, technology, engineering, or mathematics (STEM) fields, which typically have clearly defined careers post-graduation (NCES, 2017). About half, or 52%, of the students who originally declared mathematics as their major, changed to something else within the first three years of college (NCES, 2017). Emerging adults not only experience this instability in the previously mentioned areas of work, school and romantic relationships, but a prime example of this change mentioned by Arnett (2014) is the movement of living spaces during this 18-25-year age range. According to the United States Census Bureau (2017), only 37.6% of residents under 35 years own a home (U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey, 2017). For those who do not own a home, renting is the primary means of securing living spaces. Though renting during this time provides the flexibility to move quickly for a job change, relationship change, or even graduate school, flexibility also leads to more instability.

Self-focus is unique for the emerging adult because of the lack of full responsibility to other commitments. Children will have their parents and teachers to answer to and there are a set of rules or norms they will follow. Once an individual hits age 30 years, they typically have more responsibilities that include a spouse, a set career, and children (Arnett, 2014). It is during the time of emerging adulthood where an individual experience the opportunity to focus on their self and the opportunity for a great amount of autonomy in decision making. College students in their first year often have the structure of class schedules, living arrangements, and a meal plan, but no one is telling them when to eat or forcing them to attend their classes. It is pertinent that the relationship between the emerging adult and their parent or guardian changes from an authoritative role to more of an advisor role. Advice is sought out, but only when asked for and thus the feeling of freedom and “not being told what to do” ensues. Arnett (2014) mentions a vital piece of self-focus by describing it as healthy for the emerging adult. The “not being told what to do” helps the emerging adult to discover their routine and habits. It is an important time to start healthy routines and learning the tasks involved in daily living.

The feeling of in-between describes the gap existing between the freedom and anxiety in decision making. Emerging adults are caught in between their adolescence and their adulthood and it causes anxiety and pressure to make the right choices. Arnett (2014) in his research identified three main characteristics emerging adults use to explain adulthood. Those characteristics are “accept responsibility for yourself”, “make independent decisions”, and “become financially independent” (Arnett, 2014). Even though these are gradual and do not happen all at once, emerging adults use these as benchmarks into adulthood.

Lastly, *possibilities/optimism* is the final element Arnett (2014) uses to describe emerging adults. An important reason for the optimism is due to the fact that many of the hopes and

dreams of the emerging adults have not been broken or challenged. They envision landing the dream job/career right after college, getting married and experiencing nothing but happiness and satisfaction. When in reality, many of the things may not come true or look like they expected in the years after emerging adulthood. On the contrary, there exists a vast amount of possibilities that contributes to the optimism. Many of these emerging adults have left their family of origin and have not developed new relationships or their own family (Arnett, 2014). For those coming from difficult childhoods or backgrounds, emerging adulthood is an opportunity to leave all of that behind and not let it define the individual moving forward. The developmental stage of emerging adulthood serves as an important contextualization when exploring why college students decide to “drop out” and how universities can work to retain those potential students.

Retention

Retention, for the purposes of this study, will be operationally defined as the return of a student from their first Fall enrollment at a university to their second Fall enrollment at the same institution. It is typical for a first-year student planning to attend a 4-year public university to start their studies and begin enrollment in the Fall semester. There is a great deal of confusion in the terminology institutions use for defining continued enrollment of students. The National Student Clearinghouse Research Center (2019) defines retention as continued enrollment at the same institution in the fall terms of the student’s first and second years but defines ‘persistence’ as continued enrollment with the same parameters at a different institution. Whereas, EAB describes ‘persistence’ as any continued enrollment from semester to semester (i.e., Fall to Spring) (EAB, 2015). The term “drop out” is seen within the collegiate retention literature and is synonymous with the term ‘attrition’. In addition to the conundrum of terms, multiple theoretical approaches have been used to describe, predict and explain retention. From Tinto’s (1975)

expansion of Spady's (1970, 1971) student integration model to Dewberry and Jackson's (2018) application of the theory of planned behavior, student retention and "drop out" have been at the forefront of university administration strategies and efforts. Though the national retention rates for first-year students enrolled in 4-year public universities have risen from 69.5% in 2009 to 71.2% in 2017, further exploration is needed to keep these retention rates moving upward (National Student Clearinghouse Research Center, 2019).

Since Tinto (1975) started to focus much of his work on expanding different theoretical approaches to explain why a student "drops out" or does not continue enrollment, institutions have focused a great deal of their own attention on strategies to retain the students while ultimately hoping they graduate within four years. Tinto (2001) mentioned the reason "drop out" occurs is due to the lack of financial resources, unclear goals, academic struggles, less than ideal commitment and the mismatched "fit" within the university. A study by Millea et al. (2018) supported the ideas of financial resources, academic success and "fit" serving as determinants of retention. They collected institutional data from the years 1998 to 2004 to identify the determinants of retention over these six years. The data collected during this time were high school GPA, ACT scores, age, race, gender, state residency (in-state or out of state), number of class absences, first year GPA, average class size, residence hall status, and the type of aid they received (scholarship type and loan type). They found that merit-based scholarships, grants and athletic scholarships had a positive significant relationship on retention along with smaller class sizes and higher grades in first year classes. The researchers were surprised to find that living on campus, number of absences, and in-state residency did not have an effect on retention from the first to second year (Millea et al., 2018). This study contributed to Tinto's (2001) highlight of the importance on of lack of financial resources serving as a determinant in the decision to continue

enrollment along with the classroom size and “fit” associated with smaller class sizes. Adding to these reasons was the research by DeBerard et al. (2004). Their research examined the predictors of academic achievement and retention of first-year students. DeBerard and colleagues (2004) added potential psychosocial determinants to the list of variables including demographics, previous academic record, smoking, drinking, coping mechanisms, perceived social support, and health related quality of life. Their research questions were to assess the demographic, health, academic, social and coping characteristics of these first-year students and how these variables were related. Data were retrieved from the institution for demographics and previous academic record while smoking and drinking were self-reported. Drinking alcohol was measured by asking the question about the number of times 5 or more alcoholic drinks were consumed in one sitting and smoking was measured with the question about the number of cigarettes smoked per day. Social Support risk factors were measured using the Multidimensional Perceived Social Support Scale (MPSSS). Coping risk factors were measured with the Ways of Coping Checklist-Revised (WOC). Lastly, physical and mental health were measured using the 36-item Short Form Health Survey (SF-36). Results indicated a positive significant relationship between academic achievement (GPA, both high school and first year) and retention. Whereas the 10 other predictor variables explained 56% of the variance in academic achievement, only the predictor of GPA had a positive significant relationship with retention. These findings add to the discussion of a model in which risk factors can be proactively identified in first-year students. Even though these predictor variables, excluding GPA, did not individually have a direct relationship with retention, they collectively contributed to the overall model in which a positive significant relationship was found between high academic achievement and retention. These findings serve as a basis for the development of control variables to include in any examination of predictors of

university student retention. Along with these findings, Tinto (1975) suggested the reason for “drop out” was dependent on the characteristics of the individual before entering college, including their family background and secondary schooling thus, leading to an overview and history of theories used to describe why “drop out” occurs.

In the last 40 years, the primary framework used to explain university student retention has been the Student Integration Model (Spady, 1970, 1971). This model was originally based on Durkheim’s (1897) theory of suicide, which describes suicide as a continuation from a failure to integrate socially and morally into the world. Spady (1970, 1971) applied this model to student retention and added the notion that the decision to “drop out” is due to low grades and the lack of integration at the institution (Dewberry & Jackson, 2018). Tinto (1975) further suggests that retention also depends on a student’s commitment to finish coursework and their efforts to integrate into the university academically and socially. Ajzen (1991) originally developed the Theory of Planned Behavior (TPB) and Dewberry and Jackson (2018) applied this theoretical framework to college retention and drop out. The Theory of Planned Behavior (Ajzen, 1991) suggests that a person’s behavior predicated on their positive or negative attitudes toward the behavior, the subjective norms around the behavior, and the individual’s perceived behavioral control toward performing the behavior (Ajzen, 1991). These three variables were found to significantly predict drop out behavior and explained over 60% of the variance in the student’s intention to drop out. They also found the student integration variables of academic and social integration did not predict a student’s intention to withdraw (Dewberry & Jackson, 2018). Other studies have agreed with the integration portion of Tinto’s expanded version of Student Integration and have considered the student’s fit within the university community or the extent to which they felt like they belong (Morrow & Ackermann, 2012). Morrow and Ackermann (2012)

conducted their study to assess the role sense of belonging had in the intention to persist and actual retention of students from their first year to their second. Persistence was used to describe a student's intention to graduate from the institution they were enrolled in. It was hypothesized that high levels of sense of belonging, which were categorized by peer support, faculty support and classroom comfort, and lower levels of reported isolation would have a relationship with intention to persist along with second year retention. Another added hypothesis was a positive significant relationship with positive motivational attitudes and a negative significant relationship with the negative motivational attitudes in regard to retention and intention to persist (Morrow & Ackermann, 2012). They found that peer support was a significant predictor in second year retention whereas faculty support had a significant relationship with intention to persist. As for the motivational attitudes, instrumental value had a positive significant relationship with intention to persist and personal development had a positive significant relationship with second-year retention (Morrow & Ackermann, 2012). Instrumental value serves as the belief that education will lead to a better job or career and personal development involves the student's ability to think creatively and critically (Morrow & Ackermann, 2012). Hull-Blanks and colleagues (2005) added to the suggestion that students who have more intrinsic motivational attitudes, like personal development focus, were more likely to come back for their second year. This work and the study performed by Morrow and Ackermann (2012) introduces the motivational attitudes that underly and contribute to sense of belonging and warrant further examination into additional factors.

Sense of Belonging

Baumeister and Leary (1995) suggest that we all have an innate need to belong and if this need is not met, there will be a prevalence of negative outcomes on adjustment, well-being and

social development. They explained this need as a desire for interpersonal relationships and as an important component of motivation (Baumeister & Leary, 1995). This relationship drives the decisions individuals make in their interpersonal lives. It is also pertinent to state that individual differences exist in the strength and magnitude of the need to belong and varies within the social context. For the individual to have this need met, relationships must be high quality, must suggest frequent contact and must be void of high amounts of conflict or negative attributes (Baumeister & Leary, 1995). Sense of belonging has been studied with sport contexts in youth in Allen's (2003) study of sense of belonging as a primary social motivator within youth sport participation (Allen, 2003). Sense of belonging has been shown to serve as a motivator in the retention of college students (O'Keeffe, 2013). Through his work, he wanted to identify the solutions as to why student "drop out" occurs. O'Keeffe (2013) mentions that a supportive and caring environment within the higher education setting is important in a student's decision to continue enrollment. This supportive and caring environment is created by the development of optimal faculty/student relationships, a well-resourced counseling center to address mental health concerns, and the involvement of individual differences. This adds to the previously mentioned findings by Morrow and Ackermann (2012) that faculty support has a significant relationship with intention to persist along with the intrinsic motivational attitudes of personal development and instrumental value.

Self Determination Theory (SDT) addresses the idea of autonomy and competence, along with belonging, contributing to the intrinsic motivation or self-regulation, social development and well-being of an individual (Ryan & Deci, 2017). SDT focuses not only on the social contexts that positively contribute and meet these three needs, but it directs attention to contexts

that thwart the fulfillment of these needs. Within the larger meta-theory, six mini theories are identified to help explain motivation within different domains and contexts.

The first mini theory is Cognitive Evaluation Theory (CET) and this mini-theory positions itself around intrinsic motivation. CET explains the critical roles competence and autonomy have on an individual's intrinsic motivation. Intrinsic motivation explains that an individual's motivation is within the interest of the task, curiosity and the learning process. In contrast is extrinsic motivation which describes one's motivation as being fueled by external rewards, comparison or evaluations of others (Ryan & Deci, 2017). Within CET, belonging plays a lesser role and is not ideal to help explain the model of retention positioned around one's relatedness.

The second mini theory is Organismic Integration Theory (OIT). OIT addresses extrinsic motivation and internalization which describes extrinsic motivation as being instrumental to the internalization of regulations and values. Different styles of extrinsic motivation are described within OIT and include *external regulation*, *introjection*, *identification* and *integration*. Each of these types of internalization vary in their characteristics and the perceived locus of control. The perceived locus of control explains the causal relationship between the behavior and style of internalization. *External regulation* describes the behavior being motivated and dependent on external rewards. *Introjection* is a type of regulation that diverges from external rewards and involves regulating behavior in a way that predicates on internal demands of the self. *Identification* as a style of regulation involves the individual being motivated by a confirmation of their identity or see the behavior as important to their own values and self. *Integration* is the last style of regulation and entails the most autonomous form of extrinsic motivation. Those regulating behavior through integration are bringing the value of the behavior fully into one's

self-identity (Ryan & Deci, 2017). OIT would be ideal to help explain the motives or regulation of physical activity behavior but does not fully engage relatedness as a key aspect.

Causality Orientations Theory (COT) is the third mini-theory and describes the individual differences in orientation toward certain environments and regulations of behavior. COT includes three orientations: *autonomy orientation*, *control orientation* and *impersonal orientation*. *Autonomy orientation* is where the individual behaves out of interest or the value of the task. *Control orientation* is the orientation where one behaves out of a concern for gains or rewards. The last orientation, *impersonal orientation or amotivated orientation*, is where the individual's attraction to the behavior is around anxiety of their competence (Ryan & Deci, 2017).

The fourth mini theory of SDT is Basic Psychological Needs Theory (BPNT). BPNT positions around the three basic needs of autonomy, competency and relatedness described within the meta-theory. If each of the three needs are met, contentions of BPNT suggest that intrinsic motivation, self-regulation, well-being and psychological health will increase and contexts that thwart these needs will negatively affect motivation, psychological health and well-being. BPNT has primarily focused on the testing within developmental and cultural settings (Ryan & Deci, 2017).

Goal Contents Theory (GCT) is the fifth mini theory of SDT and describes the impact that intrinsic and extrinsic goals have on motivation and well-being. GCT posits the two types of goals in contrast when describing well-being and psychological health. Extrinsic goals are related to popularity, social comparison or financial success whereas intrinsic goals are described as personal growth, closeness to community or personal relationships (Ryan & Deci, 2017).

Relationships Motivation Theory (RMT) serves as the sixth mini theory within the overall meta-theory of SDT. RMT focuses primarily on relatedness/belonging and according to contentions of this perspective, if need for relatedness is satisfied, the other two needs of autonomy and competence are more likely to be met. Belonging and autonomy are positioned together and are described to be vitally important to increase well-being and feelings of support (Ryan & Deci, 2017). Similar to the work conducted by Baumeister and Leary (1995), Ryan and Deci (2017) describe the satisfaction of relatedness serving as an essential part of one's wellness and growth. The thwarting of relatedness is argued to play a role in the ill-being of an individual (Ryan & Deci, 2017). Due to the high amount of consideration to belonging and relatedness in the retention models of first-year university students, RMT arguably serves as a better fit to lead the current study as the theoretical framework.

Belonging serves as a key determinant to explain retention and has been shown to have a significant relationship with social acceptance, academic success and achievement (Freeman et al., 2007; Meeuwisse et al., 2010; Walton & Cohen, 2007). Freeman and colleagues (2007) examined the relationship between academic motivational attitudes and sense of belonging when not much research had focused on belonging within a college population. They studied 238 first year students and adapted the Psychological Sense of School Membership (PSSM) originally developed by Goodenow (1993) for studying middle school populations. The PSSM was adapted to include sense of belonging within a specific class and the university as a whole (Freeman et al., 2007). The motivational indicators measured were academic self-efficacy, intrinsic motivation, and task value. Results indicated a strong association with belonging and all three motivational attitudes along with the perception of a caring faculty member, the university community at large and their level of social acceptance.

It is warranted to ask the question about individual or group differences when examining the level of belonging experienced. Belonging has been shown to differ within historically marginalized or underrepresented populations versus the majority population (Meeuwisse et al., 2010; Walton & Cohen, 2007). Walton and Cohen (2007) conducted two experiments with both white and black students while assessing their sense of belonging and academic achievement. The first condition told the black students that there would be less friends and that led to a decreased sense of belonging and lower academic achievement whereas the white students were unaffected. The second condition included three stages that assessed the preconceived individual differences in academics between white and black students and served to mitigate the doubts of belonging. Results indicated an increase in academic achievement within the black students while the white students were unaffected (Walton & Cohen, 2007). Consistent with these findings and group differences in belonging, Meeuwisse and colleagues (2010) studied a model of the higher education learning environment that addressed belonging, higher levels of faculty and peer interaction and academic success. The researchers wanted to view the model's fit within the ethnic majority versus the ethnic minority of university students. The ethnic minority was described as the individual having at least one parent who was born outside of the Netherlands. In this study, 523 students from 4 different universities completed the questionnaire and results indicated that the ethnic minority group felt a higher sense of community when they experienced a high-quality formal relationship with their faculty and peer students, but this did not lead to an overall higher sense of belonging. Within the ethnic majority group, sense of belonging was increased with informal relationships with peer students. As for the relationship between belonging and academic success, a strong relationship was found for the ethnic majority and not the minority (Meeuwisse et al., 2010).

In the relation to O’Keeffe’s (2013) mention of the caring and supportive environment, Rankin and colleagues (2016) also looked at campus climate as an influence on academic success of student-athletes. In their conceptual framework, they hypothesized that student-athlete characteristics, institutional characteristics and demographics were mediated by campus climate to determine level of academic success. Campus climate included perceptions of respect, climate perceptions, interactions with faculty, and other perceptions related to experiences with staff. In relation to academic success, the climate factor of interaction with faculty had a significant positive relationship (Rankin et al., 2016). The interactions students have while enrolled are vital to the creation of a sense of belonging. Evidence would suggest that engagement in exercise and physical activity contribute to a sense of belonging and a further exploration into the benefits of physical activity engagement along with the physical activity behavior of college students is needed.

Physical Activity

The USDHHS second edition of their *Physical Activity Guidelines for Americans* (2018) mention the benefits of physical activity including improved cognitive function, decreased depression and anxiety risk, improved overall quality of life and improved sleep. Other benefits among these are decreased disease risk and an increase in musculoskeletal health. The main modalities of physical activity mentioned are aerobic, muscle-strengthening, bone-strengthening, balance and flexibility. Each modality has different outcomes and can be completed in different settings but also has the opportunity to be combined together in different exercise. Intensity, frequency and duration are included as considerations when planning a physical activity and exercise regimen. The recommendations the USDHHS provide for adults is at least 150 minutes of moderate to vigorous intensity per week. Substantial health benefits occur when the duration

is increased to 300 minutes or more per week (USDHHS, 2018). Evidence has been found to show that exercise leads to an increase in peripheral brain-derived neurotrophic factor in healthy humans (BDNF), which leads to an increase in cognitive function (Huang et al., 2014).

Even with evidence to support the positive relationship between physical activity and health related outcomes, roughly 33% of college students are not meeting the USDHHS recommendations for aerobic activity while roughly 60% are not meeting the recommendations for active adults according to the American College Health Association (ACHA) *National College Health Assessment* (American College Health Association, 2020). Furthermore, only 40% of universities and colleges in the U.S. require any sort of physical education course as part of their degrees (Cardinal, Sorenson and Cardinal, 2012). There exists in the literature three major problems with current research in physical activity behaviors of college students. The first is the lack of focus historically on the physical activity behavior of the college student population. The second is the prevalence of single level studies instead of multi-level and holistic studies identifying the psychosocial, environmental and personal levels of physical activity. Third, is the inconsistent and primarily subjective use of measures of physical activity (Keating et al., 2005). Within the university context, physical activity is often thought to only occur in the confines of campus recreation. Though campus recreation can serve as a space and place for physical activity, physical activity is not limited to a campus recreation center but can also be incorporated in various spaces and contexts across campus. Physical activity can include taking a walk around the campus or performing the types of physical activity mentioned by the USDHHS in other spaces. Much of the focus on physical activity research in college students has been on the physical activity patterns, determinants and stages of physical activity change while focus in the last 15 years has been on intervention studies (Keating et al., 2005).

More recently, Peterson et al. (2018) examined sedentary behavior and physical activity engagement in younger university students ages 18 to 20 years using accelerometers. Their study included a questionnaire about student demographics and extra-curricular activities along with measurement of their sedentary behavior (SB), moderate to vigorous physical activity (MVPA), Body Mass Index (BMI) and waist circumference (WC). Results of analyses of relationships between SB, PA, self-reported extra-curricular activities, BMI and WC indicated both MVPA and SB were negatively associated with BMI, 'other' race/ethnicity (African American, mixed, Hispanic) and sedentary extra-curricular activities. For the multiple regression including WC, results indicated a negative relationship with SB and sedentary extra-curricular activities had a positive relationship with WC. The researchers indicated that university students may have both high levels of MVPA and high levels of SB (Peterson et al., 2018). The profound issue with the sedentary behavior is the prevalence of weight gain and the "freshman 15" among college students (Fedewa et al., 2014).

It is also important when considering the physical activity behavior of college students to include differences between groups. Buckworth and Nigg (2004) performed a study with 493 college students who were already enrolled in one of 10 conditioning activity classes. At the beginning of the course, participants had taken a questionnaire to identify indicators of physical activity and sedentary behavior. In their findings, men reported to be more physically active, but also spent more time watching TV or using the computer compared to women. Older students also reported more computer use while the younger students reported more physical activity. Computer use for men and TV for women both had significant negative relationships with physical activity (Buckworth & Nigg, 2004). More recently, the ACHA in their *National College Health Assessment* reported only 64.9% of female university students are meeting USDHHS

guidelines of 150 minutes or more of moderate-intensity physical activity per week compared to 73% of men meeting those guidelines. The active adult recommendations include the aerobic activity guidelines as well as strength training activity 2 or more days a week involving all major muscle groups (USDHHS, 2018). For the active adult recommendations, only 48.3% of males are meeting them compared to 36.2% of females. Papalia et al. (2018) examined the number and type of technology-based monitoring of physical activity among university students and found no difference in technology device usage among males and females but did find that male device users reported significantly higher levels of moderate physical activity compared to women. Their results also indicated higher physical activity enjoyment in women who used the devices compared to men who used devices (Papalia et al., 2018).

Work has also been done to identify the motivations and barriers for exercise within college students (Ebben & Brudzynski, 2008). In their study, 1044 participants reported exercise behaviors and barriers to participation in exercise. Results indicated 76.8% reported they exercised and their common motives included general health, stress reduction, feel good/better, maintain fitness and enjoyment/pleasure. It was also reported that 76.1% of the participants wanted to exercise more and stated the reasons 'less schoolwork', 'more time', 'more motivation', 'a sport to train for' and 'fewer time commitments' as indicators that would lead to more exercise. Barriers stated by participants included laziness, no time, no motivation, other priorities and no energy (Ebben & Brudzynski, 2008). A study performed by Quartiroli and Maeda (2014) used a Self-Determination Theory (SDT) framework to examine physical activity engagement and sedentary behavior in university students. Students enrolled in a required physical fitness course (n = 875) were surveyed about their physical activity engagement and sedentary behavior as well as motivational variables to describe their behavior. Results indicated

a slight negative relationship between physical activity and sedentary behavior. The motivational variables of behavioral regulation and psychological needs satisfaction both explained only 2.8% of the variance in sedentary behavior and 14.3% of the variance in moderate to vigorous physical activity (Quartirolì & Maeda, 2014). Student's self-regulation has been found to be positively associated with moderate-intensity physical activity (Horacek et al., 2018). These findings suggest unique motivations around sedentary and physical activity behavior. As mentioned previously, Fletcher (2016) found that university students tend to be more motivated extrinsically rather than by autonomous behaviors. Their findings suggest that motivation to exercise is heavily influenced by communication between their important relationships, societal pressures and the communication between themselves (Fletcher, 2016). Social influences exist in addition to the motives for engagement in physical activity. Harmon et al. (2016) examined perceived influence on college student's physical activity and diet behaviors. They administered questionnaires to 40 students attending college in Hawaii measuring their physical activity and diet along with a name generator. The participants rated the influence of nominees as well as comparing the behavior of the influencers to their own behavior. Results indicated significant others as the most influential and high school friends as the least influential. Perceived influence in relation to physical activity was lower compared to the perceived influence on diet (Harmon et al., 2016). Along with the motivation and influences to exercise, the context and physical space of where college students physical activity/exercise needs to be examined.

Research has been conducted regarding the physical environment, such as pathways, of university campuses and how the walkability or bike-ability influences student physical activity behavior (Horacek et al., 2018). Horacek and colleagues (2018) found the ease of biking and walking on a university campus was related to walking behavior and BMI. Evidence has been

found to support campus recreation usage as a form of physical activity and the influence it has on retention. In a study looking at the relationship between campus recreation usage and its influence on retention, Hall (2006) conducted in-depth interviews asking participants to talk about their experiences within the campus recreation center as well as their motivations to be active. The emerging themes all centered on the theme of “sense of community at the university”. Other themes included socialization, friendship, and the desire to be physically active. The participation in campus recreation was noted to have a positive relationship with sense of community at the university, which also contributed to the students’ reasoning to remain enrolled at the university (Hall, 2006). As previously mentioned, academic success was noted as an influence in retention and other positive outcomes such as grade point average, persistence or graduation and course credit completion. Sanderson et al. (2018) conducted a study identifying the impact campus recreation participation has on these academic success variables. They explained that often campus recreation programming provides multiple opportunities for students to be involved. These programs include group fitness, intramural sports and overall facility usage. Overall facility usage is determined by the number of times the student utilized the facility while intramurals sports and group fitness can be determined by the number of sessions or games students participate in. After all the data were collected from the students, the researchers found a positive significant relationship with campus recreation usage and outcome variables GPA, persistence and course credit completion (Sanderson et al., 2018). It is worth mentioning that these campus recreation usage variables do not explicitly measure the level of physical activity and further exploration is warranted in order to look into physical activity behaviors outside campus recreation centers.

CHAPTER III

METHODOLOGY

This chapter provides an overview of the participants included in the study, the variables and measures used in the survey, procedures, design and the data analysis conducted. The purpose of this study was to determine if physical activity and sense of belonging predict retention of university students from their first year to their second year.

Participants

A sample of 1600 first-year undergraduate students enrolled at a mid-size university in the southwestern region of the U.S. were recruited to participate in the study. Two separate samples of 800 students each were obtained from the institution's assessment office and a total of 310 respondents were included in the study. Participants who completed the survey consisted of 77.1% female and 22.9% male ($M = 19.18$ years, $SD = 1.11$ years) and 40% first-generation. Along with these, demographic variables of race/ethnicity and first-generation college/university student status were included. Race/ethnicity was broken down into 7 categories: American Indian or Alaska Native (.6%), Asian (1.6%), Black or African American (4.8%), Hispanic or Latino (27.7%), Multiracial (5.2%), Native Hawaiian or Other Pacific Islander (.3%), Non-Resident Alien (.6%) and White (59%).

Measures

Demographics

Demographic data included GPA, age, gender, race/ethnicity and first-generation student status. These data were obtained from the institution's research office and matched with participants' reported survey data through their institutional issued email address.

Belongingness Scale – Higher Education (BES-HE)

Metsälä et al. (2012) developed a sense of belonging scale with the purpose of measuring the level of belonging on a university campus. The scale is a 35-item questionnaire that measures responses with a 5-point Likert scale (1 = “never true” and 5 = “always true”). The scale was based on the Levett-Jones et al. (2009) Belongingness Scale – Clinical Placement Experience (BES-CPE), but the researchers focused on the new scale using the theoretical framework of Tinto's (1975) Student Integration Theory. Sample questions include, “It is important to me to feel accepted by my fellow students” and “I let my fellow students know I care about them by asking how things are going with them and their family.” The scale includes three subscales of “connectedness to student community” (22 items), “connectedness to higher education institute” (9 items), and “integration” (4 items). Metsälä et al. (2012) suggest that both “integration” and “connectedness to student community” are related to well-being of the student and “connectedness to higher education institute” is associated with many of the success measures used by higher education institutions (e.g., academic success, retention, academic achievement) (Metsälä et al., 2012). Each subscale has previously been tested for reliability and the Cronbach (1951) alpha scores were found to be .95 for “connectedness to student community”, .84 for “connectedness to higher education institute”, and .81 for “integration”.

International Physical Activity Questionnaire – Short Form (IPAQ-SF)

The International Physical Activity Questionnaire – Short Form (2003) is a 7-question self-report measure that asks participants about their level physical activity in the last seven days prior to completion (Craig et al., 2003). The questionnaire uses metabolic equivalents (METs) to quantify the level of physical activity and participants are asked about the number of hours/minutes/days they spent performing vigorous physical activity (VPA), moderate physical activity (MPA), walking and sitting (W&S). METs are described by Jetté et al. (1990, p. 555), “One metabolic equivalent (MET) is defined as the amount of oxygen consumed while sitting at rest and is equal to 3.5 ml O₂ per kg body weight x min”. This MET definition exists as a simple and practical way to calculate the energy cost of physical activities. To calculate the number of METs for each category within the questionnaire, the predetermined values set by Ainsworth et al. (2000) were multiplied by the activity minutes and activity days. The predetermined values are 3.3 METs for walking, 4 METs for moderate activity and 8 METs for vigorous activity. Once calculations were made for each category, the totals were summed to get the total MET physical activity minutes/week. The values for each category are then reported as a continuous value in METs or in the categories of low, moderate, and high level of physical activity. Categories of low, moderate and high were used to operationally define the various levels of physical activity for the purposes of the present study. The ranges in total MET minutes/week for low is less than 600, 600 to 3000 for moderate, and more than 3000 MET minutes/week for high. The total MET minutes/week can be performed with any combination of vigorous, moderate, or walking. The questionnaire was tested for test-retest reliability, found to have high reliability Cronbach alpha

scores ($\alpha > .80$) and predictive, concurrent, convergent, criterion and discriminant validity with 18-65-year-old adults (Craig et al., 2003).

University Campus Recreation Usage (RecTrac)

The recreation center located on the university campus allows students to engage in various types of physical activity. The RecTrac data includes how many times or over a specific time period a student used their university issued ID to enter the campus recreation center. The single point-in-time entrance into the recreation center includes the opportunity to engage in multiple categories of activity including general access into the facility, variety of intramural games, and various fitness sessions. All three of these were combined into a single variable that represented the number of times the campus recreation center was utilized by the student over the course of the one Spring semester up to when classes were transitioned online. It is pertinent to mention that the RecTrac data represents how many days a student entered the facility but does not record multiple visits per day or provide any indication of participation in physical activity.

Student Retention

Student retention was measured two separate ways in the current study. The first was through census data provided by the institution's research office for each participant and was matched using their email address. After consultation with the institution's Office of the Registrar, it was determined that the registration status at census, which was September 8 for the Fall semester prior to when other data was collected, best represented a student's enrollment status for retention variable purposes. The second way of retention was measured was through questions embedded into the survey. Participants were asked to self-report if they had registered for classes during the spring semester of focus using the responses: yes, no and not sure. The

final question asked for reasoning as to why the participants had registered, or not, for classes that semester.

Procedure

An Institutional Review Board (IRB) application was submitted and IRB approval was granted to subsequently conduct the following study procedures. Participants were sampled by obtaining a list of from the institution's assessment office of students who met the criteria of being in their first year of matriculation at the university. An initial sample of 800 students was obtained from the institution's assessment office and the survey was sent out via email during the middle of May following the conclusion of the participant's spring semester. The measures and questionnaires were combined into a single Qualtrics survey consisting of 47 questions and participants were given an informed consent agreement to complete prior to starting the survey. A statement was added to the beginning introduction of the questionnaire to ask participants to think about their answers to the following questions based on how they felt while on campus before the transition to online courses due to the COVID-19 pandemic. Participants were informed of and consented to the purpose of the study and the type of data collected as well as the data being matched to their institutionally provided email address. After completion of the survey, participants were directed to the opportunity to fill out a separate survey to be entered into an incentive drawing. Email communication was distributed from the researcher's institutional email address using the email distribution function within Qualtrics. An initial email communication (Appendix B) that explained the study and three follow-up email reminders were sent to the participants in the initial sample. In order to increase participation rates, the amount of incentive that was originally 10 gift cards at a value of \$15 each to 20 gift cards and a subsequent email was sent to inform participants who were already finished and those who had not

completed the survey at that time. The survey was left open for four weeks and those who participated were sent a thank you email shortly before the closure of the survey. After a review of the number of respondents, it was decided to obtain another sample to increase the number of participants to a desired number over 200. Another sample of 800 was obtained from the institution's assessment office and the survey was distributed to the second sample with the same email communication and length of time to complete the survey.

Design

The two primary independent variables included in this study were sense of belonging and physical activity while the dependent variable was retention. Sense of belonging was measured using Metsälä et al. (2012) Belongingness Scale – Higher Education (BES-HE) while physical activity was measured using the self-report International Physical Activity Questionnaire – Short Form (IPAQ-SF) and the campus recreation RecTrac data. Retention was measured at census for the Fall semester prior to survey data collection and by obtaining registration information and through two self-report questions in the survey. Physical activity was represented by both RecTrac data and the results of the IPAQ-SF (2003) to help gain a more thorough understanding of the student's overall physical activity engagement. Once the survey results were collected, participant's institutional email addresses were used to match survey result records to Rectrac data obtained from the campus recreation center, registration status and the demographic variables of GPA, age, gender, race/ethnicity and first-generation student status provided by the institution's research office.

Statistical Analyses

Prior to any data collection, an a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2007) to determine sample size needed for a logistic regression model using the three

subscales of sense of belonging (connectedness to student community, connectedness to higher education institute, and integration) and physical activity to predict retention while controlling for GPA, age, gender, race/ethnicity, and first-generation student status. These variables were selected as control variables due to the relationship they have with retention as mentioned in prior research. Results of the power analysis indicated that using a large effect size ($OR=5.57$) and an alpha of .05 a total sample of 85 participants would be needed to achieve a power of .80.

After all questionnaire/survey data were collected, institutional and campus recreation center were matched, and the file was kept in a password protected Microsoft OneDrive location. The data file was then imported into IBM SPSS Statistics software Version 27.0 (IBM Corp, 2020). Descriptive statistics were calculated for all variables (each subscale of belonging, physical activity [IPAQ-SF, Rectrac], enrollment status, GPA, Age, Gender, Race/Ethnicity, First-generation status) to determine if the logistic regression assumptions of independency and non-multi collinearity between the independent variables were met. A logistic regression was selected due to multiple independent variables and a dichotomous and categorical dependent variable. Descriptive statistics were also used to determine if any outliers existed in the data set and to obtain measures of central tendency for demographics and each subscale of belonging. Two logistic regression models were built to determine the predictive relationship between physical activity, sense of belonging and retention. Results reported are the chi-squared goodness of fit test to determine the fit of the overall models and the magnitude of the relationship between the independent variables and the dependent variable of retention. Results reported are the odds ratio for each model to determine which variables significantly predicted the odds of being retained. Since retention was measured at census for the Fall semester and through self-report questions, the models include the enrollment status at the time of census. To test the first

research question regarding the relationship between physical activity and belonging, a bivariate correlation was conducted and Pearson's Correlation Coefficient (r) is reported. To account for the self-report questions about registration status, an inductive thematic analysis was performed by the primary researcher to identify naturally occurring themes emerging from the open-ended question about the decision to register or not register for courses.

CHAPTER IV

RESULTS

Preliminary Analyses

Descriptive analyses, including means, standard deviations and frequencies were conducted for each variable to determine if any outliers or non-normal data existed as well as to ensure the logistic regression assumptions of independency and non-multi collinearity between the independent variables were met. A total of 310 survey responses were obtained. After running descriptive analyses for the variables IPAQ-SF and BES-HE, extreme values were coded as missing. Two participants were removed due to severe outlier responses on the IPAQ-SF, missing values on the Belonging Scale – Higher Education (BES-HE) and qualitative responses to retention. According to the *Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)* (2005) values for walking, moderate and vigorous bouts should not exceed three hours or 180 minutes per day. This limited the total number of hours per week for each level of physical activity to 21 hours. Any responses that exceeded these limits on each of the IPAQ-SF level of activities were coded as missing. After coding these missing values and removing the two participants, a total of 167 responses who completed all questions were included in the logistic regression. Table 1 displays the counts and percentages for the variables of gender, first-generation status and race/ethnicity. Table 2 displays the correlation matrix, means and standard deviations for all variables used in the analyses.

Table 1*Demographic Variables of Participants*

Demographic variable	<i>n</i>	%
Gender		
Female	239	77.1
Male	71	22.9
Retention		
Yes	275	88.7
No	35	11.3
First Generation		
First-Generation	124	40.0
Not First-Generation	186	60.0
Race/Ethnicity		
American Indian or Alaska Native	2	.6
Asian	5	1.6
Black or African American	15	4.8
Hispanic or Latino	86	27.7
Multiracial	16	5.2
Native Hawaiian or Other Pacific Islander	1	.3
Non-Resident Alien	2	.6
White	183	59.0

Note. N = 310

Table 2*Descriptive Statistics and Reliabilities for Study Variables*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	α
Overall belonging	235	3.63	.60	.94
Connectedness to student community	237	3.63	.56	.90
Connectedness to higher education institution	238	3.74	.62	.83
Integration	240	3.51	.86	.84
IPAQ Level ^a	171	2.49	.62	
RecTrac Visits	310	16.27	22.1	
GPA	309	3.25	.59	
Gender	310			
Age	310	19.18	1.12	
Race/Ethnicity	310			
First-Generation Status	310			
Retention	310			

^a 1 = low, 2 = moderate and 3 = high.

α = Cronbach's alpha

Student Retention

A total of 310 students completed the survey and registration status was provided by the institution's assessment office for each of the survey respondents. Of the entire sample, 88.7% ($n = 275$) were retained due to their enrollment in at least one credit by the census date and the mode number of credits enrolled was 15 credits. Census date falls after the drop class deadline for the fall semester and is used by the institution in its reporting of final enrollment numbers. The average GPA of the participants was 3.26 ($SD = .59$). A total of 228 participants completed the qualitative comments and were included the inductive analysis in response to the open-ended question about why or why not participants registered for classes. A total of 214 'yes' comments, 12 'no' and 2 'not sure' were analyzed by the primary researcher for normally occurring themes. Of the participants who answered 'yes' to the question if they had registered for courses, the five themes of 'Graduate/Earn Degree', 'Enjoyment', 'Institutional factors', 'COVID-19' and 'Required/Expected' emerged from the comments about why they had registered for classes. The emergent themes from the why 'no' comments were 'Transferring', 'Personal reasons' and 'COVID-19'. Lastly, the themes from the 'not sure' answers were 'Barriers' and 'Institutional factors'.

Physical Activity

Physical activity engagement using the IPAQ-SF (2003) is reported in the categories of high, moderate and low. Out of the entire sample, 91 participants reported high levels of physical activity engagement per week, while 65 participants reported engagement in moderate and 11 participants reported low physical activity engagement. RecTrac data showed a maximum of 122 visits and a minimum of zero visits from August 26 (beginning of Fall 2019 semester) and March 17, which was the point at which classes transitioned online ($M = 16.27$, $SD = 22.1$).

Belonging

Mean scores of overall belonging and the three subscales of the BES-HE (2012), 5-point Likert Scale, were 3.63 (SD = .60) for ‘overall belonging’, 3.63 (SD = .56) for the subscale of ‘connectedness to student community, 3.74 (SD = .62) for the subscale of ‘connectedness to higher education institution’ and 3.51 (SD = .86) for the subscale of ‘integration’. Cronbach (1951) alpha reliability values for each of the subscales were .94 for ‘overall belonging’, .90 for ‘connectedness to student community’, .83 for “connectedness to higher education institute’ and .84 ‘integration’.

Relationship Between Belonging and Physical Activity

Pearson’s r results indicated no evidence of a statistically significant linear relationship between ‘overall belonging’ scores from the BES-HE and physical activity engagement reported through the IPAQ-SF, $r(165) = .13$, $p = .094$. Results of a second correlation between ‘overall belonging’ scores from the BES-HE and the number of visits reported through RecTrac data indicated no statistical evidence of a significant linear relationship, $r(233) = .159$, $p = .015$.

Relationship Among Physical Activity, Belonging and Retention

Two logistic regression models were employed using the primary indicators in the study within the first model and adding in the control variables to the second model to determine the predictive relationship between the independent variables, physical activity and belonging and the dependent variable of retention. Odd’s Ratio by Independent Variable for models of retention are presented in Table 3.

Table 3*Odds Ratios (OR) by Independent Variable for Logistic Regression Models of Retention*

Variable	Model 1	Model 2 ^b
Constant	.693	.004
Connectedness to Student Community (BES-HE)	.167	.046*
Connectedness to Higher Education Institution (BES-HE)	3.065	5.13
Integration (BES-HE)	4.54**	10.174**
Low (IPAQ-SF)	146681679.561	124520852.914
Moderate (IPAQ-SF)	1.16	1.26
RecTrac	1.01	.990
GPA		4.032*
Gender		6.786*
Age		.987
American Indian or Alaska Native		.103
Asian		28702620.168
Black or African American		211368764.707
Hispanic or Latino		.837
Multiracial		1199687343.162
Non-Resident Alien		.000
First-Generation Student		1.692
Model chi-squared ^a	22.05***	44.77***
Degrees of freedom	6	16
Model prediction success	92.2%	94%
Nagelkerke R ²	.273	.519

Note. N = 167; White, Male, High (IPAQ-SF) and Not First-Generation served as reference variables.

^a Chi-squared models were significant at $p < .001$

^b Adjusted Odds Ratios reported for Model 2

* $p < .05$, ** $p < .01$, *** $p < .001$

Results of the first model indicated that at least one of the predictors ('integration' subscale of belonging) explained a significant relationship between the predictors and retention $X^2(6, N = 167) = 22.05, p = .001$ and explained 27.3% of the variance (Nagelkerke R Squared). The Hosmer-Lemshow Test found the model to be a good fit ($p = .471$) and a 92.2% correct prediction. The primary indicators entered into the model were the three subscales of the BES-HE, three categories of the IPAQ-SF and RecTrac data. The BES-HE subscale of 'integration' was found to be the significant predictor of retention ($p = .001$). Odds Ratio results indicate that as 'integration' scores increased, the odds of retention was 4.54 times more likely.

The second model included the addition of GPA, age, gender, race/ethnicity and first-generation status along with the primary and previously noted independent variables in the first model. Results of the Chi-squared test indicated that at least one of the predictors explained a significant relationship between the independent variables and the dependent variable of retention $X^2(16, N = 167) = 44.77, p < .001$ and explained 51.9% of the variance in retention (Nagelkerke R Squared). The Hosmer-Lemeshow Test indicated the model was a good fit ($p = .833$) and the Classification Table found the model to predict an overall percentage of 94%. The independent variables 'connectedness to student community' ($p = .037$), 'integration' ($p = .003$), GPA ($p = .042$) and gender ($p = .034$) were found to significantly predict retention. Odds Ratios for 'connectedness to student community' indicated that as this subscale increased, the odds of an individual's retention increased by .046. The subscale of 'integration' Odds Ratio indicated as 'integration' increased, the odds of an individual's retention increased by 10.17. GPA was also found to be a significant predictor and Odds Ratio analysis revealed that as GPA increased by one point, the odds of a student retention increased by 4.032. As for gender, results of Odds

Ratio analyses indicated that females were 6.786 times more likely to retain and continue their enrollment compared to males. See Table 3 for these results.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The purpose of the current study was to determine if physical activity and sense of belonging predict retention of university students from their first year to their second year. Results of the logistic regression model testing the predictive relationship between the independent variables of belonging and physical activity and the dependent variable of retention provided evidence and explained 27.3% of the variance in retention and correctly predicted 92.2% of retention in the sample. The subscale of ‘integration’ within the BES-HE scale used to examine belonging emerged to be the only significant predictor within the first step of the model. When the control variables of gender, age, GPA, race/ethnicity and first-generation student status were added to the model, ‘integration’ along with GPA, gender and the subscale ‘connectedness to student community’ emerged as significant predictors of retention. When these control variables were added, 51.9% of the variance in retention was explained and correctly predicted 94% of retention. These findings confirm findings from previous research that has indicated university/college students’ perceived ‘fit’, or belonging, as a significant predictor of retention (Tinto, 2001).

Physical Activity and Belonging

Along with the purpose and research question addressing the prediction of retention, the first research question addressed the exploration of the relationship between physical activity and belonging. Pearson *r* correlations indicated no evidence of a statistically significant relationship between physical activity, both IPAQ-SF scores and RecTrac data, and belonging in this sample

of university students. This finding is contrary to prior research suggesting a significant positive relationship between belonging and high levels of physical activity (Bailey & McLaren, 2005). The IPAQ-SF was modified with the COVID-19 pandemic in mind and the lack of correlation between physical activity and belonging could be attributed to concerns about the reflective nature of the questionnaire and the time modification. In the modification participants were asked to answer the following survey questions based on how they felt prior to classes transitioning online. The questionnaire includes seven items and asks participants to reflect on the 'last week of physical activity' whereas the current study asked participants to *reflect back* on a 'typical week of physical activity' prior to classes transitioning online during the Spring 2020 semester because of the COVID-19 pandemic. A significant gap existed between the point at which classes transitioned online on March 17 and the time the survey was sent out to the participants on May 13. This gap raises potential concerns about the subjective nature and accuracy of participant responses to the questionnaire. A total of 143 responses on the IPAQ-SF were coded as missing due to extreme values over the limits of physical activity within each category (vigorous, moderate, low and walking) recommended by the *Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)* (2005) and subsequently were not included in the analysis for the present study.

The RecTrac data collected for this sample showed how many days each participant entered into the campus recreation facility over the timeframe of August 26 to March 17, which represented the Fall 2019 semester and a portion of the Spring 2020 semester until the point classes were transitioned online and the facility was closed due to the COVID-19 pandemic. There were significant concerns and inconsistencies with the RecTrac data. The first concern with the data is in relation to the measurement of visits to the facility. Entrance into the facility is

only counted once per day and therefore, the number of visits does not account for multiple visits per day. A second concern with the RecTrac data is that it does not provide a measure of any actual physical activity levels when a participant visits the campus recreation center. As mentioned in the methodology section of this paper, the visit includes potential group fitness class attendance and/or participation in intramurals along with general visits into the facility but is not indicative of the physical activity level, frequency or duration of the visit.

Retention

Within the current study, ‘integration’, ‘connectedness to student community’, GPA and gender emerged as significant predictors of retention for first-year university students. These findings confirm prior research conducted by Tinto (2001) that identified ‘fit’ as an important contributor to retention. Cumulative GPA was obtained from the participant’s first year at the university and confirms prior research identifying GPA as a significant predictor (Millea et al., 2018) and academic success as a significant predictor (Freeman et al., 2007). In regard to gender, it is noted as a finding, but could be attributed to the high difference between the number of males and females within the sample and institution (239 females, 71 males). Out of the entire sample, 88.7% (n = 275) were enrolled after the census date. This compares very well in relation to the retention rate of 67.9% of first-year students reported by the institution (Institutional Reporting and Analysis Services, 2020). According to the analysis of the naturally occurring themes reported by participants in the qualitative comments, the themes of ‘Graduate/Earn Degree’, ‘Enjoyment’, ‘Institutional factors’, ‘COVID-19’ and ‘Required/Expected’ were identified. ‘Graduate/Earn Degree’ emerged as a rationale for course registration and included comments around “...graduating on time” and “I’m planning to stay on track for my degree as planned regardless of obstacle”. This theme confirms prior research conducted by Morrow and

Ackermann (2012) that revealed instrumental value and personal development as an important and significant predictor of retention. Instrumental value serves as the belief that education will lead to a better job or career and personal development involves the student's ability to think creatively and critically (Morrow & Ackermann, 2012). Hull-Blanks and colleagues (2005) added that personal development and more intrinsic motivational indicators contribute to retention. In addition to these findings, the emergent theme of 'Enjoyment' is particularly relevant. 'Enjoyment' was reported as a reason why good fit for the institution or satisfaction in their education. One participant noted they, "...would like to stay on track to graduate in 4 years. I am really *enjoying* my education here and love the community I am a part of." These more intrinsic motives to enroll, and hence be considered retained are consistent with previous research (Hull-Blanks et al., 2005; Morrow & Ackermann, 2012).

Findings from the logistic regression confirm the theoretical approach proposed to help explain the predictive relationship between physical activity, belonging and retention. Relationship's Motivation Theory proposes a strong importance on belonging or relatedness as a key need that if satisfied will enhance the personal development and well-being of an individual (Ryan & Deci, 2017). Results from the analyses of the present study show belonging as a significant predictor of retention through the subscales of 'integration' and 'connectedness to student community'. These findings would suggest the relatedness is vital to the choice to continue enrollment and without integration into the university, the odds a student continues enrollment is lower. Furthermore, these findings support the proposition set within RMT regarding the negative outcomes on well-being and psychological health resulting from an environment where relatedness is thwarted. The "integration' items within the BES-HE addressed the degree to which a student feels like the institution is a fit for them along with

reverse coded items speaking to feelings of being an outsider and non-attendance at social events. In addition, ‘connectedness to student community’ addressed the degree to which a student values being accepted by fellow students and the importance they place on opening up, creating bonds and feeling supported. All of which contributed to their choice and motivation to continue enrollment at the institution and extends prior research indicating the importance of a supportive environment (O’Keeffe, 2013).

Limitations and Future Directions

There exists a major limitation and consideration of this study: data collection conducted during the Covid-19 pandemic of 2020. The survey questions were modified with the pandemic in mind, but it is imperative to consider these findings within temporal and historical constraints and refrain from any comments to generalize these findings to the larger, more typical, higher education landscape. The pandemic has had an unprecedented and profound impact on individuals’ personal, professional and academic aspects of life. Although generalizations cannot extensively be forwarded based on these findings, the results have value for the specific institution and their work to mitigate and understand the impact the pandemic has had on their students. Another limitation noted earlier is the subjectivity and lack of confidence in the physical activity measures IPAQ-SF and RecTrac data. The RecTrac data does not properly indicate the level of physical activity occurring within the campus recreation center. The IPAQ-SF had specific boundaries set for each of the physical activity categories of walking, moderate and vigorous. These limits contributed to 143 values coded as missing.

This research and data will continue to be analyzed aside from the regression models used for the purposes of this study. Further directions with the data collected include a more thorough analysis of the qualitative comments. A thorough review of the qualitative comments

will assist in the confirmation of the motivational behavior around retention and further confirm RMT (Ryan & Deci, 2017) as a theoretical fit for the model of retention. Further correlational analyses should also be conducted with the demographic variables of race/ethnicity and first-generation student status with the BES-HE and IPAQ-SF results, and additional analyses with financial aid status and relationships with retention. Additional exploration and review of the demographic variables of race/ethnicity and first-generation student status and their relationship with the significant predictor of belonging will be valuable to extend the research and inform the institution about best practices to mitigate student attrition and drop-out behavior.

The subjectivity of the physical activity measures warrants further exploration into a study using more objective measures of physical activity like accelerometers (Peterson et al., 2018) or health tracking devices (Papalia et al., 2018) in addition to the BES-HE to determine the relationship between subscales of belonging and physical activity. Though physical activity did not emerge as a significant predictor of retention, prior research shows a relationship with campus recreation usage, belonging and retention (Hall, 2006). Thus, further examination is warranted to continue testing the relationship between the two independent variables physical activity and belonging with the dependent variable retention.

Conclusion

The research conducted for the purposes of this thesis adds to the existing research on models of university student retention as well as establishes a basis for a new theoretical framework to explain the motivational indicators of university student retention and continued enrollment. The study participants reported a greater retention percentage compared to the rest of the first-year students at the institution; this finding in particular warrants further analysis into the data collected. This may be due to the relatively high ‘overall belonging’ scores on the BES-

HE among the entire sample ($M = 3.63$, $SD = .60$). There also exists a hypothesis in which the reflective nature of the survey may have contributed to a greater awareness of an individual's feelings of belonging, thus contributing to their choice to enroll. Both logistic regression models were significant in correctly predicting retention and serve as a basis to extend the understanding of the critical need to belong and have the need for relatedness satisfied or "fit", predictors of retention, physical activity engagement and environments supporting or thwarting the well-being of an individual on a university campus. The present study findings contribute to the beginning of a line of research aimed at exploring university student retention behavior with physical activity engagement and belonging as key elements to consider. Evidence-based understanding of the motivational indicators that contribute to a student's choice to continue enrollment are vital to the role higher education institutions embrace. Student's psychological health and well-being are impacted by the environment created on university campuses. Thus, the present study findings and subsequent considerations must be at the forefront as institutions move forward into this uncertain era of keeping emerging adults engaged and returning to university campuses.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

DATE: December 5, 2019

TO: Bryson Kelly

FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1501233-2] The landscape of higher education: Examining the relationship between university students' physical activity, CRC usage, grit, belonging and retention

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF

EXEMPT STATUS DECISION DATE: December 4, 2019

EXPIRATION DATE: December 4, 2023

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX B

EMAIL INVITES

Hello fellow UNC Bear,

I hope you are doing well and taking care of yourself. I am a current graduate student in the School of Sport and Exercise Science and am conducting research for the purpose of my Master's thesis. The link below contains a research survey about your sense of belonging and engagement/activity levels as it relates to retention at UNC. The survey is designed to take approximately 10 minutes to complete. Once you finish the survey you will have a chance to enter a raffle to win **one of twenty \$15 Visa gift cards or UNC gear of equivalent value.**

The purpose of the research is to understand the current undergraduate population of UNC and their physical activity engagement as well as their sense of belonging as it relates to retention prior to classes transitioning online. This research will directly apply to the things UNC is doing as an insitution to support you as a student.

If you have any questions about the survey, please contact me, Bryson Kelly, Primary Researcher, at bryson.kelly@unco.edu or (970) 351-1023.

Begin the survey now:

[\\${1://SurveyLink?d=Take%20the%20Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${1://SurveyURL}](#)

We don't want to bug you. Follow the link to opt out of future emails:

[\\${1://OptOutLink?d=Click%20here%20to%20unsubscribe}](#)

Be well and go Bears!

Bryson Kelly

University of Northern Colorado

School of Sport and Exercise Science

Gunter Hall

Greeley, CO 80639

Please note:

Participation is voluntary. You may decide not to participate in this survey and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please complete the survey if you would like to participate in this research. Completion of the survey indicates consent to participate. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910

Hello fellow UNC Bear,

As a first year UNC student I would love to know about your sense of belonging and engagement/activity levels as it relates to retention at UNC. The survey is designed to take approximately 10 minutes to complete. Once you finish the survey you will have a chance to enter a raffle to win **one of twenty \$15 Visa gift cards or UNC gear of equivalent value.**

Please share your perspective as your feedback helps me understand the relationship between physical activity, sense of belonging and retention.

Begin the survey now:

[\\${1://SurveyLink?d=Take%20the%20Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${1://SurveyURL}](#)

Your responses and contact information will be kept confidential. The survey will remain open until **July 8**. If you have any questions about the survey, please contact me, Bryson Kelly - Primary Researcher, at bryson.kelly@unco.edu or (970) 351-1023.

Be well,
Bryson Kelly
University of Northern Colorado
School of Sport and Exercise Science
Gunter Hall
Greeley, CO 80639

We don't want to bug you. Follow the link to opt out of future emails:

[\\${1://OptOutLink?d=Click%20here%20to%20unsubscribe}](#)

Please note:

Participation is voluntary. You may decide not to participate in this survey and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please complete the survey if you would like to participate in this research. Completion of the survey indicates consent to participate. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910

Hello fellow UNC Bear,

I wanted to take the time to say **THANK YOU** for providing your experience about your sense of belonging and physical activity engagement.

If you completed the separate survey at the end of the main survey, you will have a chance to enter a raffle to win **one of twenty \$15 Visa gift cards**. The winners will be decided and contacted, shortly!

If you have any questions about the survey, please contact me at bryson.kelly@unco.edu or (970) 351-1023.

Be well,
Bryson Kelly
University of Northern Colorado
School of Sport and Exercise Science
Gunter Hall
Greeley, CO 80639

We don't want to bug you. Follow the link to opt out of future emails:

[\\$ {1://OptOutLink?d=Click%20here%20to%20unsubscribe}](#)

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APPENDIX C

INFORMED CONSENT



University of Northern Colorado
CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH

Title: The landscape of higher education: Examining the relationship between university students' physical activity, CRC usage, belonging and retention
Bryson Kelly, Student, Bryson.Kelly@unco.edu (970) 351-1023
Dr. Megan Stellino, Professor, Megan.Stellino@unco.edu (970) 351-1809

Purpose and Background:

The purpose of this study will be to understand the current undergraduate student population of UNC and their physical activity and engagement at the campus recreation center, as well as their sense of belonging as it relates to retention.

If you agree to participate in this study, you will be asked a series of questions about your sense of belonging and physical activity. **This survey should take you no longer than 8-10 minutes to complete.** The data collected in this survey will be matched with your campus recreation use data and institutional information (including bearmail, race/ethnicity, gender, number of credits enrolled, residency status, first-generation, term GPA) using the bear email address you provide so the researchers can gain a better understanding of what influences university student retention.

There are no risks to participants in this study beyond those that are present in your everyday life and involvement at the University of Northern Colorado. Your participation will also be directly requested and is therefore completely voluntary. The questions have previously been used with similar campus recreation and physical activity assessments. This study is not designed with the intention to change behavior in any way, shape, or form but rather investigate the sense of belonging and physical activity and campus recreation center use levels as it relates to retention.

Participation is voluntary. You may decide not to participate in this study and if they begin participation they may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled.

As a participant in this study, you may withdraw from the study at any time. If you do not feel comfortable answering any of the questions, please state that you do not feel comfortable answering or that you need a moment to collect yourself. Also know that we can contact the UNC Counseling Center to set up free counseling at: UNC Counseling Center, 1901 10th Ave., Greeley, CO 80639, or 970-351-2496.

Although there are no direct benefits to you, we hope to gain more insight into your sense of belonging and physical activity engagement and hope to learn more about the factors that contribute to retention. Risks from the study would include minimal discomfort due to the self-awareness brought upon individuals by completing the questionnaire. If any discomfort is experienced, you may contact the UNC Counseling Center to set up free counseling at: UNC Counseling Center, 1901 10th Ave., Greeley, CO 80639, or 970-351-2496.

Please take your time to read and thoroughly review this document and decide whether you would like to participate in this research study. If you decide to participate, your completion of the research procedures indicates your consent. Please keep or print this form for your records. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

APPENDIX D

SURVEY

Start of Block: Introduction and Informed Consent

Q2 We realize how precious your time is. That's why we made sure this survey will only take a quick 10-12 minutes of your time. (really, we timed it!) You'll be helping us out in a big way.

And don't think we are just letting you go empty-handed. Take the short survey at the end of the main survey and have a chance at winning one of 10 giveaways worth \$10 each (Visa gift cards, UNC goodies and more). We really appreciate your time and feedback.

Before you begin, you'll need to read our consent form. Once you have read it, please click on the box and start the survey. Thank you!

Clicking on the "I agree" button below indicates that:

- you have read the above information
- you agree to allow the researchers to access your student data as listed on the consent form
- you voluntarily agree to participate
- you are at least 18 years of age

If you do not wish to participate in the research study, please close this window.

Press/Click "agree" to begin survey

Agree (1)

End of Block: Introduction and Informed Consent

Start of Block: Main Survey

Q4 Bearmail address:

Belongingness

Directions: Here are a number of statements that may or may not apply to you. With classes being transitioned online, please reflect back to how these statements applied to you while on campus this year. There are no right or wrong answers, so just answer honestly, considering how you compare to most people.

1	2	3	4	5
Never true	Rarely true	Sometimes true	Often true	Always true

1.	It is important to me to feel accepted by my fellow students.	1	2	3	4	5
----	---	---	---	---	---	---

2.	I make an effort to help new students feel welcome at the University of Northern Colorado.	1	2	3	4	5
----	--	---	---	---	---	---

3.	I ask other students for advice when I need it.	1	2	3	4	5
----	---	---	---	---	---	---

4.	I am supportive	1	2	3	4	5
----	-----------------	---	---	---	---	---

	of my fellow students.					
5.	I make an effort to involve my fellow students in student activities.	1	2	3	4	5
6.	I let my fellow students know that I appreciate them.	1	2	3	4	5
7.	Other students see me as a competent student.	1	2	3	4	5
8.	I feel like I fit in with other students at the University of Northern Colorado.	1	2	3	4	5
9.	I feel like an outsider in the University of Northern Colorado student community .	1	2	3	4	5

10.	I am accepted as myself.	1	2	3	4	5
11.	I get support from my fellow students when I need it.	1	2	3	4	5
12.	The University of Northern Colorado student community gives me a sense of belonging.	1	2	3	4	5
13.	I have liked the University of Northern Colorado professors/ lecturers I have met.	1	2	3	4	5
14.	I have liked the other University of Northern Colorado staff I have met.	1	2	3	4	5

15.	I like my fellow students.	1	2	3	4	5
16.	Other students offer me help when they sense I need it.	1	2	3	4	5
17.	Feeling a part of the student activities is what I like about UNC.	1	2	3	4	5
18.	I let my fellow students know I care about them by asking how things are going with them and their family.	1	2	3	4	5
19.	I feel understood by other students.	1	2	3	4	5
20.	I feel free to share my disappointments at least with one of my fellow students.	1	2	3	4	5

21.	There are people at UNC with whom I have a strong bond.	1	2	3	4	5
22.	I feel like an outsider among other students.	1	2	3	4	5
23.	Other students ask for my opinion about different matters.	1	2	3	4	5
24.	I am uncomfortable attending the UNC social functions because I feel like I do not belong there.	1	2	3	4	5
25.	Other students notice when I am absent because they ask about me afterwards.	1	2	3	4	5

26.	One or more of my fellow students confides in me.	1	2	3	4	5
27.	I invite fellow students to eat lunch/dinner with me.	1	2	3	4	5
28.	I keep my personal life to myself when studying.	1	2	3	4	5
29.	My fellow students invite me to extracurricular events.	1	2	3	4	5
30.	It is important to me that other students notice me somehow.	1	2	3	4	5
31.	It is important to me that there is cooperation between degree programs.	1	2	3	4	5

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 32. | I like to socialize with the UNC staff and students. | 1 | 2 | 3 | 4 | 5 |
| 33. | I am invited by the UNC staff and students to socialize with them. | 1 | 2 | 3 | 4 | 5 |
| 34. | It is important for me that there are places where the UNC staff and students can socialize. | 1 | 2 | 3 | 4 | 5 |
| 35. | Socializing with other students gives a boost to my studies. | 1 | 2 | 3 | 4 | 5 |

IPAQ We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about a typical week of physical activity before the transition of online classes. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in a typical week. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

IPAQ - Q1 During those 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ Day(s) Per Week (1)

Skip To: IPAQ - Moderate If During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, [Day(s) Per Week] =

Display This Question:

If During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, [Day(s) Per Week] > 0

IPAQ - Q2 How much time did you usually spend doing vigorous physical activities on one of those days?

_____ Minutes Per Day (1)

_____ Hours Per Day (2)

Page Break

IPAQ - Moderate Think about all the moderate activities that you did in a typical week.

Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

IPAQ - Q3 During those 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ Day(s) Per Week (1)

Skip To: IPAQ - Walking If During those 7 days, on how many days did you do moderate physical activities like carrying light... [Day(s) Per Week] =

Display This Question:

If During those 7 days, on how many days did you do moderate physical activities like carrying light... [Day(s) Per Week] > 0

IPAQ - Q4 How much time did you usually spend doing moderate physical activities on one of those days?

_____ Minutes Per Day (1)

_____ Hours Per Day (2)

Page Break

IPAQ - Walking Think about the time you spent walking in those 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

IPAQ - Q5 During those 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ Day(s) Per Week (1)

Skip To: IPAQ - Sitting If During those 7 days, on how many days did you walk for at least 10 minutes at a time? [Day(s) Per Week] =

Display This Question:

If During those 7 days, on how many days did you walk for at least 10 minutes at a time? [Day(s) Per Week] > 0

IPAQ - Q6 How much time did you usually spend walking on one of those days?

_____ Minutes Per Day (1)

_____ Hours Per Day (2)

Page Break

IPAQ - Sitting The last question is about the time you spent sitting on weekdays during a typical week. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

IPAQ - Q7 How much time did you usually spend sitting on one a week day?

_____ Minutes Per Day (1)

_____ Hours Per Day (2)

Page Break

Q26 Have you or will you register for Fall 2020 courses?

Yes (1)

No (2)

Q27 Why or why not?

End of Block: Main Survey