THE ROLE OF SENSE OF COHERENCE IN THE RELATIONSHIP BETWEEN LEVELS OF PHYSICAL ACTIVITY AND SELF-ESTEEM AMONG STUDENTS.

by

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Declaration

I, John Sebastiaan Lordan, hereby declare that the Master's Degree mini research dissertation that I herewith submit for the Magister Societatis Scientiae degree (Psychology) at the University of the Free State is my own independent work, and that I have not previously submitted it for a qualification at another institution of higher education. I affirm that permission has been granted by both my supervisors to submit this dissertation and that I furthermore cede copyrights in favour of the University of the Free State.

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“Let all that I am praise the Lord; May I never forget the good things he does for me.”

Psalm 103:2

ABSTRACT

Sense of coherence (SOC) forms part of the positive psychology paradigm and offers insight into many contexts related to the health-disease continuum. Physical activity can easily be connected to this equation as the health benefits of physical activity are well known. Alternatively, self-esteem incorporates a psychological construct that can be influenced by multiple factors found in one's biological, psychological, social and spiritual environments. Furthermore, the emerging adulthood population, which includes university students, is described as being an age of possibilities in various domains of functioning, and therefore makes this an interesting age group on which to conduct research. Hence, the aim of this study is to investigate the role of SOC on the relationship between physical activity and self-esteem among students.

A non-experimental quantitative approach, in accordance with a correlational research design, was used to conduct this study. A sample of 196 student participants between the ages of 18-25 currently studying at The University of the Free State in South Africa were included through a non-probability, convenience type sampling method. This sample comprised of 106 (54.1%) female and 90 (45.9%) male students. Three groups were formed for statistical purposes namely: males, females and a total group. Self-report questionnaires formed a battery of measuring instruments to collect data. This battery included the Physical Activity Questionnaire for Adults (PAQ-AD) to measure physical activity levels, the Rosenberg Self-Esteem Scale (RSE) to measure global self-esteem, and the Orientation to Life Scale (29 items, SOC-29) to measure SOC. Biographical information was obtained through a biographical section subsumed within the PAQ-AD.

Results yielded, a significant positive relationship of .193 for the total group regarding physical activity and self-esteem. However, discrepancies were obtained when the total group

was split according to gender. A significant positive relationship of .219 was found for male students with regard to the relationship between these two variables, but not for female students. Results suggest that significant positive relationships exist between self-esteem and SOC for all three groups. Furthermore, significant positive correlations were found between physical activity and SOC for all three groups. Lastly, while no mediating/ moderating effect could be obtained for the role of SOC on the relationship between physical activity and self-esteem in female students, SOC was identified to have a mediating role on the relationship between these variables in male students.

In conclusion, key findings suggest that gender accounts for variances among male and female students in the relationship between physical activity and self-esteem. Furthermore, differences were observed in terms of the role of SOC in respect to physical activity and self-esteem when investigated for male and female students independently.

Keywords: university, students, emerging adults, physical activity, exercise, sport, self-esteem, self-concept, sense of coherence, salutogenesis

OPSOMMING

Koherensiesin is ’n konstruk wat deel uitmaak van die positiewe sielkunde-paradigma. Hierdie konstruk bied dus insig ten opsigte van aspekte wat verband hou met die kontinuum waarop gesondheid en siekte gemeet word. Fisiese aktiwiteit kan tot hierdie raamwerk gevoeg word, aangesien die voordele van fisiese aktiwiteit met menslike gesondheid verband hou en in die literatuur welbekend is. Laastens kan die sielkundige konstruk, selfbeeld, as ‘n veranderlike voorgestel word wat deur verskeie faktore binne die konteks van ‘n persoon se biologiese-, psigologiese-, sosiale-, en spirituele omgewings beïnvloed kan word. Verder word die ontluikende volwasse-bevolking, wat universiteitstudente insluit, in die literatuur voorgestel as ‘n ouderdom wat talle moontlikhede in verskeie areas van funksionering inhou. Daarom is dit ‘n interessante groep om op navorsing te doen. Hierdie studie het dit ten doel om die rol van koherensiesin in die verband tussen fisiese aktiwiteit en selfbeeld onder universiteitstudente te ondersoek.

Hierdie studie het ‘n nie-eksperimentele, kwantitatiewe benadering gevolg, tesame met ‘n korrelasionele navorsingsontwerp. ‘n Steekproef van 196 studente, tussen die ouderdom van 18 en 25, en wat tans aan die Universiteit van die Vrystaat in Suid-Afrika studeer, is verkry. Hierdie steekproef is deur middel van ‘n nie-waarskynlikheids, gerieflikheidsteekproeftrekking gedoen. Die steekproef het altesaam uit 106 (54.1%) vroulike en 90 (45.9%) manlike studente bestaan. Ten einde data in te samel, is selfevalueringsvraelyste as toetsbattery gebruik. Hierdie toetsbattery het die volgende ingesluit naamlik: die *“Physical Activity Questionnaire for Adults”* (PAQ-AD) vir die meet van fisiese aktiwiteitsvlakke, die “*Rosenberg Self-Esteem Scale”* (RSE) vir die meet van globale selfbeeld, asook die “Orientation to Life Scale (29-items – SOC-29), ten einde koherensiesin (SOC) te meet. Biografiese inligting was bekom deur middel van biografiese vrae wat in die PAQ-AD bevat word.

Resultate dui daarop dat daar ‘n beduidende, positiewe verband (.193) rakende fisiese aktiwiteit en selfbeeld, by die totale groep is. Verskille is egter in die totale groep, wat op grond van geslag verdeel is, waargeneem. ‘n Beduidende positiewe verband (.219) rakende die bogenoemde veranderlikes, is onder manlike studente gevind, maar nie onder vroulike studente nie. Resultate dui verder op beduidende postiewe verbande tussen selfbeeld en koherensiesin, sowel as fisiese aktiwiteit en koherensiesin onder al drie die groepe. Laastens, alhoewel koherensiesin nie as mediator-/ moderatorveranderlike in die verband tussen fisiese aktiwiteit en selfbeeld onder damestudente gevind kon word nie, kon hierdie veranderlike as mediatorveranderlike in die verband tussen fisiese aktiwiteit en selfbeeld by manlike studente geïdentifiseer word.

Ten slotte is daar in hierdie studie bevind dat geslag tot verskille onder manlike en vroulike universiteitstudente bydra wanneer die verband tussen fisiese aktiwiteit en selfbeeld ondersoek word. Verder is verskille ook waargeneem toe die rol van koherensiesin, in hiérdie verband, afsonderlik vir mans- en damestudente ondersoek is.

Sleutelwoorde: universiteit, studente, ontluikende volwassenes, jong volwassenes, fisiese aktiwiteit, oefening, sport, selfbeeld, selfkonsep, koherensiesin

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Recent research emphasises the benefits of regular physical activity as well as the high correlation between physical activity and self-esteem (Barton, Griffin, & Pretty, 2012; Joseph, Royse, Benitez, & Pekmezi, 2014; Leavy et al., 2013). In this current study, physical activity is hypothesised as a construct that has become exceedingly popular in recent years. Numerous adverse physical health outcomes are associated with physical inactivity, including strokes, hypertension, diabetes, coronary artery disease and breast and colon cancers (Iosue, Sarchiapone, & D'Aulerio, 2016; Joseph et al., 2014). In addition, negative psychological consequences of physical inactivity have also been documented and include aspects such as increased emotional and psychological stress and poor levels of well-being (Joseph et al., 2014). Although some university students may have a significant amount of time available to engage in physical activity, others in more strenuous courses such as medicine may struggle to reach minimum amounts of suggested physical activity per week (Gerber, Botes, & Vorster, 2016). Furthermore, some literature suggests that male students' physical activity levels are higher than that of female students (Adesoye, Obiyemi, Ibraheem, & Ajibua, 2017; Bergier, 2015).

When considering self-esteem, it is important to recognise that the literature depicts it as a psychological construct that can be described as an individual's positive or negative attitude towards the self in totality (Rosenberg 1965; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). Furthermore, evidence in the literature suggests that low self-esteem is a prominent risk factor which could be used to predict a variety of negative psychological outcomes such as

depression for example (Beck, 1967; Orth, Robins, & Roberts, 2008; Rieger, Göllner, Trautwein, & Roberts 2016).

When considering SOC, it is of critical importance to note that it forms part of the salutogenic health model (Antonovsky, 1987, 1993). This theoretical model was developed in order to explain maintenance or improvement of location on a health ease/dis-ease continuum and to expand the understanding of stressors, coping and health (Antonovsky, 1993). SOC comprises of three distinct subcomponents which will be described in greater detail in the sections that follow (Antonovsky, 1993). According to Sipos, Jeges and Tóth (2015), higher SOC is linked to higher self-esteem. Furthermore, good mental health and being active have been found to be among some of the most prominent predictors related to a strong SOC (Söderhamn, Sundsli, Cliffordson, & Dale, 2015). Literature suggests that regular physical activity acts as a protective factor against the development of negative health and mental health outcomes (Centers for Disease Control and Prevention, 2011; Leavy et al., 2013). Hence, it is hypothesised that the dynamics of physical activity, self-esteem and SOC among the student population might hold important information that can assist in finding more ways in combating negative health and mental health outcomes.

According to an Ebscohost search conducted on 21 October 2018, little evidence has been obtained to explain the role of SOC in the relationship between self-esteem and physical activity, especially in student populations. Sipos et al. (2015), suggests that an interdependency between self-esteem, physical activity and SOC exists. Results yielded from this study would thus provide valuable information with regard to these three constructs among students from the University of the Free State (UFS) in South Africa (SA). Further investigation is therefore warranted to bridge the current gaps found in the literature. The aim of this study is thus to

investigate the role of SOC in the relationship between physical activity and self-esteem among university students from the UFS.

As this study comprises of five distinct chapters, it is suggested that the delineation of each chapter provided below is considered prior to reading through each of these subsections. Chapter one offers a brief introduction that aims to orientate the reader about what to expect in this study.

Chapter two offers a broad and in-depth literature review on the constructs used in this study, namely: physical activity, self-esteem and SOC. Each of these constructs are explained individually and are subsequently drawn together in an integrative section. Each section presents a clear definition of the construct under examination and furthermore elaborates on the current and past studies found in the literature in order to highlight certain empirical findings which are deemed relevant when considering the context of this study.

The third chapter offers a description of the methodology used in order to conduct this study successfully. Here, particulars of the methodological approach, sampling techniques, participants, data collection and analysis, as well as measuring instruments, are presented.

Chapter four is structured to clarify statistical procedures used in order to objectively analyse and interpret the results obtained in the present study. Here, a step-wise description of every process followed is explained in detail. Numerical data is transformed into understandable entities in order to linguistically and graphically illustrate all findings obtained in this study. Also included in this chapter is a discussion of the results obtained. Here findings are explained by situating it within existing literature. This chapter seeks to join findings obtained in the present study with similar as well as contrasting results found in previous studies.

Chapter five describes the limitations encountered in the present study. Recommendations for future research studies are furthermore proposed in order to improve on some of the pitfalls identified within this particular study. Finally, the value of the study is briefly provided in a concluding paragraph.

CHAPTER 2: LITERATURE REVIEW

2.1 Level of Physical Activity

2.1.1 Introduction

The following section analyses and offers a holistic perspective on physical activity and related aspects. Due to the well-known benefits and protective abilities of this construct as presented in the literature, it is hypothesised that various avenues of research can be followed. The present study investigates multiple trends with regard to how physical activity has developed among different populations and in different contexts. The university student population and aspects specifically influencing their level of physical activity are considered especially for the purpose of the present study. Finally, physical activity among the South African population is reviewed to examine similarities and variances in comparison to other population groups. In respect of the present study, physical activity can be hypothesised as one method which can impact on multiple domains of human functioning in a positive way.

2.1.2 Physical Activity Defined

Physical activity is defined by Caspersen, Powell and Christenson (1985) as "any bodily movement produced by skeletal muscles that results in energy expenditure" (p. 126). Physical activity in daily life can further be categorised into five different types, namely: physical activity that occurs during roles fulfilled through one's occupation, through sports, conditioning, household, or other activities (Caspersen et al., 1985). Thus in its simplest form, physical activity can be categorised by dissecting it in terms of identifiable parts of the day during which it occurs. To date, this definition of physical activity has been widely accepted and is commonly

used by the World Health Organization (WHO), which suggests that it is a well-defined construct (World Health Organization, 2010). The WHO does however, distinguish between physical activity and exercise as they suggest that exercise can be sub categorised under physical activity (World Health Organization, 2010). Exercise is defined by the WHO (2010) as "physical activity that is planned, structured, repetitive, and purposeful" (p. 52) and suggests that the goal/objective is to improve or maintain one or more components of fitness in oneself. The World Health Organization (2010) have furthermore developed recommended guidelines of suggested levels of physical activity per week for different age groups which are relevant to this particular study and will be discussed later.

For the purpose of this study, the instrument used to measure physical activity was developed to measure general levels of physical activity which suggests that it does not measure any specific exercise activity, but rather all forms of physical activity (Kowalski, Crocker, & Donen, 2004). No clear definition is provided by the authors regarding their view of how physical activity can be defined and therefore, for the purpose of this study it is accepted as such that the above definition regarding physical activity is adequate. It should however, be duly noted that these researchers clearly state that their instrument measures general levels of physical activity (Kowalski et al., 2004). According to the developers of the PAQ-AD, measuring general levels of physical activity is one of its strengths due to the difficulty of precisely measuring frequency, intensity, and duration of young people's activities, especially with self-report (Kowalski, Crocker, & Faulkner, 1997). Effectively, measuring general levels of physical activity includes all types and sub categories of physical activity such as leisure time, work-related, household chores, sports and other activities as mentioned above (Copeland, Kowalski, Donen, & Tremblay, 2005).

According to the WHO, it is suggested that a minimum of 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of vigorous-intensity aerobic physical activity is required for adults aged 18-64 years old in order to maintain and benefit from a physically active lifestyle (World Health Organization, 2010). In addition, one could combine moderate- and vigorous-intensity aerobic exercises throughout the week as an equivalent of these guidelines (World Health Organization, 2010). The WHO suggests that each aerobic exercise should be performed in intervals of at least ten minutes per session. Reflecting on the literature, it is suggested that these recommended guidelines as proposed by the World Health Organization (2010) are accepted despite many challenges of implementing them worldwide (Carlson, Fulton, Pratt, Yang, & Adams, 2015; Kahlmeier et al., 2015; Sparling, Howard, Dunstan, & Owen, 2015).

Previous studies' findings have led to many arguments in favour of the benefits that physical activity can offer in various domains of human functioning which have been well-documented (Brannon, Feist, Updegraff, 2014; Dhabhar, 2014; Füzéki, Engeroff, & Banzer, 2017; Sharma, Merghani, & Mont, 2015). Some studies suggest that physical activity can decrease the incidence rates of chronic illnesses as well as all-cause mortality rates (Kodama et al., 2013: Lee et al., 2012). Regular physical activity is presumed to be directly related to benefits on the physical, psychological and physiological domains and plays a role in preventing a significant variety of illnesses and diseases in these areas (Voinea, 2018). Rose, (2018) suggests that the correct levels of physical activity could also contribute towards successful aging. An overview of evidence applicable to this study is summarised in the paragraphs that follow. Current trends are reviewed next, focusing more specifically on aspects such as physical activity among different age groups and specific considerations relating to gender.

2.1.3 Current Trends in Physical Activity: An Increase in Sedentary Behaviour and Physical Inactivity

Physical inactivity has been identified as the fourth leading cause of death worldwide (Kohl III et al., 2012). Although evidence regarding the benefits of physical activity has been available for more than 60 years, health promotion infrastructure has not stayed up to date with the developing evidence base (Kohl III et al., 2012). This in turn means that health promotion has not always received the necessary attention which more and more evidence in the literature suggests it should (Kohl III et al., 2012; Love, Adams, van Sluijs, Foster, & Humphreys, 2018). Instead, health-improving infrastructure such as programs aimed at promoting physical activity in schools, universities and communities have only started to develop in recent years leading to certain population groups becoming more physically active (Kohl III et al., 2012; Love et al., 2018). In an official document compiled by the WHO as part of their effort to improve health worldwide, a global action plan to manage and control non-communicable diseases was developed. Non-communicable diseases (NCDs) also referred to as chronic diseases/illnesses, have a long duration (World Health Organization, 2018). NCDs can result from multiple components, each of which can stem from a combination of genetic, physiological, environmental and behavioural factors. More common types of NCDs include cardiovascular diseases, cancers, diabetes and chronic respiratory diseases (World Health Organization, 2018). What the WHO suggests is that health-promoting environments should be developed in areas such as in the workplace, in schools (including universities) and other places that can enhance the general public's level of physical activity (World Health Organization, 2017). Due to efforts such as these, data needs to be gathered to base their programs on concrete evidence (Hallal et al., 2012). One of the studies conducted to advance this initiative found the following trends:

- Investigations spanned across 122 countries of which when combined, these countries represented 88,9% of the world's population for individuals aged 15 years and older. Findings suggest that males are more active than females.
- As much as 31,1% of the world's population were found to be physically inactive with proportions spanning from approximately 17% in South-East Asia to nearly 43% in the Americas and the Eastern Mediterranean.
- According to public health guidelines, only two thirds of adults (which includes the student population) reach recommended levels of physical activity, with as little as one fifth of adolescents reaching these recommended standards (Hallal et al., 2012).

A systematic review of trend data suggests that occupational physical activity is decreasing, meaning that people's daily energy expenditure at work has reduced (Knuth & Hallal, 2009). Over the past two to three decades, leisure time physical activity has increased among adults in various countries (Knuth & Hallal, 2009). It is important to note that similar studies have been conducted in affluent rather than third world countries (Juneau & Potvin, 2010; Knuth & Hallal, 2009; Palacios-Ceña et al., 2011). In keeping with this, outcomes from a study conducted in Brazil suggest that leisure time physical activity has increased in recent years, while a significant decline was observed in television-watching behaviour over the same time period (Mielke, Hallal, Malta, & Lee, 2014). Hence, an increase in leisure time physical activity seems to have become the norm rather than the exception in recent times, with more and more individuals selecting to engage in various sports and events which require them to become physically active.

Previous studies propose that physical activity declines with age, with two of the most pronounced time periods being adolescence and young adulthood (Carlson, Fulton, Schoenborn, & Loustalot, 2010; Physical Activity Guidelines Advisory Committee report, 2008). Changes associated with moving from high school to university/college are thought to be of high

significance in both males and females and can account for some of the decline mentioned above (Farren, Zhang, Martin, & Thomas, 2017). However, it has been found that increasing social support to assist students with engaging in regular physical activity is effective in helping students meet physical activity guidelines in both aerobic and muscle-strengthening exercises (Farren et al., 2017). Thus, it is important to take note of the fact that research suggests that psychosocial factors such as having social support can increase the level of physical activity among students.

2.1.4 Physical Activity and its Influence on Students Across Multiple Domains

2.1.4.1 Protective Factors

Although many benefits of physical activity have already been explored and established, many more positive effects of physical activity are still being investigated today, offering very interesting results. Considering the developmental period of emerging adulthood, it is hypothesised that during this time students make decisions independently and exclusively without any, or very little, supervision, with the aim of acquiring critical skills needed in adult life (Arnett, 2007a, 2010). Consequently, it is more probable that individuals within this developmental period might engage in risky behaviours which include excessive alcohol consumption and drug use, as well as risky sexual behaviours for example (Peach & Gaultney, 2013). However, despite these possible negative outcomes, researchers have consistently found that individuals who engage in physical activity and sport possess higher degrees of traits such as resiliency and optimism, which are considered to be positive personal resources (Lipowski, 2012; Lipowski, Lipowska, Jochimek, & Krokosz, 2016; Litwic-Kaminska & Izdebski, 2016). These factors are furthermore believed to effectively protect students from engaging in risky behaviours (Patton et al., 2011; Weiland et al., 2012). Despite finding different results for males

and females, evidence still points towards the protective capabilities of engaging in regular physical activity for both genders (Jochimek, Krokosz, & Lipowski, 2017). In one study conducted by Jochimek and his colleagues (2017), it was found that participating in regular physical activity and sport acted as a protective factor whereby it improves self-regulation. Evidently, physical activity acts as a buffer and effectively decreases the likelihood of these individuals' engaging in risky behaviours (Jochimek et al., 2017).

In addition, some studies show evidence that students who meet the guidelines for moderate to vigorous physical activity have a greater likelihood of enjoying multiple protective factors (De Vries et al., 2008; Dinger, Brittain, & Hutchinson, 2014). Literature suggests that these students display multiple positive health behaviours and outcomes, including: decreased reports of depression, reduced rates of suicidal ideation, refraining from tobacco and consuming the recommended amounts of fruits and vegetables; notwithstanding better mental health and more active socialising and a limited impact caused by stress-related issues (Bland, Melton, Bigham, & Welle, 2014; Elliot, Kennedy, Morgan, Anderson, & Morris, 2012; Lee et al., 2012; Pelletier, Lytle, & Laska, 2016; Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2009; Van Kim & Nelson, 2013).

2.1.4.2 Cognitive and Academic Factors

Studies which objectively measured physical activity and cognitive functioning found that moderate to vigorous and even light physical activity is significantly related to improved executive functioning in young adults (Chang et al., 2015; Lin et al., 2018; Loprinzi & Kane, 2015). Executive functioning has been strongly related with cognitive control which subsumes processes such as selective attention, working memory, planning and successful multi-tasking (Lin et al., 2018). Moreover, Diamond (2013) is of the opinion that executive functioning consists of three core components, namely: inhibitory control, working memory and cognitive

flexibility. Diamond (2013) elaborates on this by proposing that not only does better executive functioning predict enhanced academic achievement, but also social and occupational success later in life. In considering all of the information above, one can hypothesise that physical activity influences cognitive abilities, which as a result, plays a role in aspects relating to constructing more positive and healthy behaviours, thoughts and possibly greater overall mental health. Furthermore, one can propose that physical activity is interrelated with various other factors that co-influence one another to bring about countless benefits for an individual on a physical, psychological, physiological and spiritual level.

2.1.5 Variation in Physical Activity Among Students

2.1.5.1 Gender and Related Aspects

Although many findings display similarity between males and females to some extent when focusing on physical activities, other studies included in this section refer to certain discrepancies in this regard. In a recent study conducted by Dipnarine, Barak, Martinez, Carmeli and Stopka (2016), results found that males and females benefit equally from exercise on a physical level. This is consistent with the findings of a systematically reviewed study (Nocon et al., 2008). Interestingly however, this study concluded that despite these findings, risk reductions with regard to all-cause mortality might be larger for females than for males (Nocon et al., 2008).

Motivation to engage in physical activity also seems to differ. Research suggests that males and females are motivated by different aspects to engage in physical activity (Lauderdale, Yli-Piipari, Irwin, & Layne, 2015; Lerner, Burns, & Róiste, 2011; Roberts, Reeves, & Ryrie, 2015). Evidence suggests that a significantly higher percentage of male students prefer to engage in organised sports as opposed to their female counterparts (Lerner et al., 2011). Whereas males

tend to be motivated to engage in physical activities due to both psychological (e.g. pleasure, health, interest) and social reasons (e.g. to make friends/encouragement from social support structures), females tend to engage more in unorganised physical activity due to psychological reasons (e.g. non-competition, fitness, encouragement from friends/family members) (Lerner et al., 2011). In addition, some studies have found that physical activity can serve as motivation for students irrespective of their gender (Diehl, Fuchs, Rathmann, & Hilger-Kolb, 2018). Students who are physically active are hypothesised to believe that physical activity assists them to find a healthy balance in life, make contact with others, have fun, and more importantly, that it serves as a source which provides self-affirmation (Diehl et al., 2018). Thus the probability of physical activity being related to self-esteem seems highly likely when taking these subjective perspectives of students into consideration.

In keeping with this, the literature furthermore suggests that additional differences occur on the basis of gender as males and females differ even in the types of physical activity they tend to engage in (Casper, Harrolle, & Kelley, 2013; Salvatore & Marecek, 2010). Females are hypothesised to be more likely to select group and cardio-based exercises, whereas males prefer to engage more in muscle-strengthening exercises (Casper et al., 2013; Salvatore & Marecek, 2010). Average physical activity frequencies for male and female students also display significant differences between each other with males having a higher average exercise frequency than females (Ebben & Brudzynski, 2008). Furthermore, previous studies suggest that not only do male and female students prefer to engage different physical activity modalities, they also vary in terms of exercise frequency (Brunnquell et al., 2016; Casper et al., 2013; Ebben & Brudzynski, 2008; Salvatore & Marecek, 2010). More recent evidence adds to this finding by proposing that male students show a higher prospect of reaching physical activity guidelines than female students do (Farren et al., 2017). It can therefore be concluded that significant

differences exist between males and females and that multiple factors can account for these differences when considering the review of articles as discussed above. The question thus rises as to whether the role of SOC will be the same or vary significantly based on gender as it appears that males and females differ in various domains with regard to physical activity.

2.1.5.2 Availability of Time

Although time and the availability of it is a factor that is highly likely to affect the frequency of physical activity behaviour, it is hypothesised to contribute towards physical activity enjoyment as well (Brunnquell et al., 2016). Yet, research on this topic is not so readily available (Brunnquell et al., 2016). As already indicated in aforementioned paragraphs, multiple factors play a role in either promoting or hindering physical activity amongst university students. Research suggests that a major barrier to physical activity among students are time constraints (Diehl et al., 2018; Ebben & Brudzynski, 2008). It was found in a recent study that lack of leisure time or rather the presence of time constraints accounted for 51.3% of students' physical inactivity (Awadalla, et al., 2014). Other independent predictor variables that played a role in students' physical inactivity included non-membership at sports clubs and being engaged in strenuous academic programs such as studying medicine (Awadalla et al., 2014; Gerber et al., 2016). This correlates with findings in another study where students were unanimous in their conviction that physical activity is of utmost importance in an adult's life, yet claimed that they had insufficient time to practice physical activity often enough (Voinea, 2018). Consistent with these findings Diehl et al. (2018) found that one of the most prominent factors contributing to students' physical inactivity can be attributed to "overcrowded courses" (p. 6). In a comparative study conducted on first-year medical and nursing students at the UFS Gerber et al. (2016) found that both groups rated their health as unsatisfactory, which they hypothesised to be influenced by, amongst others, inadequate time for physical activity. This information suggests that certain

faculties at universities in which students are enrolled at, might offer very strenuous academic programs in which students can find it difficult to prioritise sufficient time for adequate physical activity. It is therefore hypothesised that students' academic involvement and field of study plays a critical role as to why some students struggle to meet the recommended levels of physical activity.

2.1.5.3 Socio-economic, Sociodemographic and Psychosocial Factors

Evidence in the literature suggests that regardless of gender and age, physical activity tends to be directly and positively related in proportion to the amount of education and income people hold (Dinç, 2017; Imhof et al., 2016). In addition, other studies have found that minority groups as well as being female are two of the most prominent factors concomitant with inadequate levels of physical activity (Kruger, Kohl III, & Miles, 2007; Towne et al., 2017). It is furthermore suggested that psychosocial factors such as self-efficacy, social support, and outcome expectancies for exercise can account for a significant amount of variance when assessing the probability of students meeting recommended physical activity guidelines (Farren et al., 2017). Drawing on these empirical findings a strong argument can be made for the large impact these components have on physical activity.

Results from a study conducted in 23 low, middle, and high income countries suggest that aspects such as low personal control in men and low personal mastery as well as medium personal control in women, are associated with physical inactivity (Pengpid, et al., 2015). Furthermore, this study also found that average prevalence rate of physical inactivity to be 41.4% amongst these countries which is higher than in studies mentioned before (Pengpid et al., 2015). Another study conducted on adolescents and university students in the US offers results which indicates that females report less physical activity than their male counterparts (Armstrong et al., 2018) thus, correlating well with previous literature (Ebben & Brudzynski, 2008; Farren et al.,

2017). In addition, other significant findings included: that white adolescent males are most likely to report any physical activity while black females aged 18 to 24 years were least likely to report this; of those who were active, black males aged 18 to 24 years reported the longest period of time spent being active while, the shortest duration of activity were reported by black females aged 25 to 29 years (Armstrong et al., 2018). This study furthermore suggests that there are significant disparities when measuring physical activity among students as results show that higher income, younger age, and being Caucasian, are associated with increased levels of physical activity (Armstrong, et al., 2018).

International research proposes the hypothesis that physical activity is more common among men than women, among Whites than African-Americans and Hispanics, among younger than older adults, and among those with higher versus lower incomes (National Center for Health Statistics, 2011). Considering vigorous levels of physical activity, recent research found that numerous factors account for variance in students who meet vigorous physical activity guidelines (Eaves et al., 2017). The contrary is also true, in which multiple factors can be attributed to students' failing to meet recommended vigorous physical activity standards. Factors found that consistently contribute towards students meeting vigorous levels of physical activity include aspects such as being involved in extracurricular sporting activities, not being in a relationship, and consuming fruits or vegetables daily (Eaves et al., 2017). Thus, it is important to take into consideration that an aspect such as SOC might further help to explain some of the variance found among students and their levels of physical activity if multiple factors contribute to their level of engagement in physical activity. In contrast, multiple dynamics such as being older than 23 years of age, smoking, or having a markedly high (>34.9 $kg \cdot m^2$) or low body mass index (BMI) (<18.5 $kg \cdot m^2$) have been found to be associated with students who do not meet recommended guidelines for vigorous physical activity (Eaves et al., 2017). In one study,

obesity was also found to be significantly and closely related to physical inactivity in general among students (Biernat & Tomaszewski, 2015).

When investigating psychosocial factors and their influence on students' level of physical activity, research offers various outcomes. One study evaluated both social and psychosocial factors and their relationship with physical activity (Dyck, Bourdeaudhuij, Deliens, & Deforche, 2015). Results showed that when students progress from high school to university, some of the most prominent factors influencing their level of physical activity includes decreased social support from their family and the type of accommodation/residency they have (Dyck et al., 2015). Consequently, self-efficacy was found to be significantly related to physical activity and facilitated the process of explaining at least some of the variance with regard to the decreased levels of leisure time physical activity in university students (Dyck et al., 2015). With this in mind, it is suggested that the way in which students perceive themselves and their abilities could potentially impact on their level of physical activity.

2.1.6 Physical Activity in the South African Context

In SA university students are exposed to multiple factors which impede their ability to engage in regular physical activity (Noorbhai, Goolam Hoosen, Lategan, & Noakes, 2014). Some of the most prominent factors that are responsible for this trend include aspects such as high workloads, types of accommodation, lack of time and logistical/financial obstacles, to name but a few (Cruz et al., 2013; Gresse, Pietersen, & Steenkamp, 2015; Noorbhai et al., 2014).

In one South African based study, results obtained suggests poor physical activity behaviour with only 4% (N = 120) of the sample tested meeting the criteria to be classified as being highly active (Mohlala & Ramalivhana, 2014). In another larger study which tested a sample of N =

722 students in South Africa, results point towards one third of students only engaging in low levels of physical activity or being inactive, approximately half of the students engaging in moderate physical activity and less than 20% of students engaging in vigorous physical activity (Pengpid & Peltzer, 2013). This study also found that physical inactivity was associated with a personal sense of lack of control (Pengpid & Peltzer, 2013), suggesting the hypothesis that SOC might have some effect on physical activity. Therefore, one could hypothesise that the present study might add to the knowledge base by providing information in this regard.

In yet another study conducted in SA, Bloemhoff (2010) found results which confirm and add to these findings. One third of students were found to be inactive/sedentary irrespective of race or gender. Gender was found to be strongly and consistently associated with overall physical activity. Males are believed to be significantly more engaged in physical activity than their female counterparts in general and this trend becomes even more meaningful when considering vigorous exercise. Despite this study confirming previous findings in the literature, results from this study also add new knowledge by suggesting that black students tend to be significantly more physically active than Caucasian students, with white female students displaying the highest level of sedentary behaviour in that study (Bloemhoff, 2010). In reflection of the above information, the following summary can be made: Firstly, irrespective of race, gender, socio-economic class or other possible influential factors, approximately one third of students studying at tertiary institutions in SA can be defined as being inactive. Secondly, more studies suggest that a significant difference between male and female students' levels of physical activity exist. Finally, multiple factors, apart from types of courses that students study, play a substantial role in the level of physical activity that students engage in at universities all across SA (Department of Sport and Recreation, 2005).

2.1.7 Conclusion

It is suggested that the effects, role and influence of physical activity are infinite. Although years of research and numerous articles and evidence are readily available, it is hypothesised that many more avenues of physical activity and possible links to other constructs have yet to be researched and analysed. It is assumed in this study that physical activity seems to be highly intertwined into the constructs under investigation and that the possible role that it might play may differ quite substantially if another sample population were to be drawn when controlling for aspects such as age, gender, ethnicity, and direction of study for example. Taking into consideration aspects such as age, gender, ethnicity, current trends and other prominent mediating/moderating factors which formed part of the above studies' results, it can be hypothesised that physical activity levels all across the globe (including SA) are not ideal. Despite enormous amounts of evidence confirming the benefits of physical activity, sedentary behaviour still seems to continue at growing rates. Reflecting even further on the literature in the above paragraphs, it could be concluded that socio-economic, sociodemographic and psychosocial factors play a significant role in influencing physical activity. These aspects are therefore suggested to be considered before writing up results for a specific population group. The following section provides details regarding the construct of self-esteem.

2.2 Self-Esteem

2.2.1 Introduction

This section sets out to offer an expansion of the construct of self-esteem. It does so by commencing with a clear definition of what is meant by self-esteem offering views primarily from the perspective of Rosenberg and related theorists. Next an in-depth discussion is formulated regarding how normal developmental trends affect the process of how self-esteem develops across the lifespan. Factors influencing self-esteem are reviewed within the university student population especially. This section typically discusses variables suggested in the literature to significantly affect self-esteem in broader detail, with reference to the applicability to this study in particular. Finally, the section concludes with evidence from the literature which examines how self-esteem affects other variables, keeping in mind that self-esteem is not merely influenced by different factors but also influences various aspects in return.

2.2.2 Definition of Self-Esteem

Upon examining the literature, one finds that self-esteem has become a term which is commonly used in various environments and domains of human functioning today and that different forms of self-esteem are suggested to exist (Baumeister, Campbell, Krueger, & Vohs, 2003; Fila-Jankowska, 2018; Orth & Robins, 2014; Øverup, Brunson, & Acitelli, 2015). It is therefore of critical importance to establish what is meant by self-esteem within the context of this study as to avoid any confusion regarding this term. Firstly, it is hypothesised that many individuals use the terms self-esteem and self-concept interchangeably, whereas in actuality, these are two distinct, yet interrelated concepts. Secondly, self-concept can be defined in terms of cognitive (e.g. academic performance), social (e.g. peer relations) and physical (e.g. bodily appearance) domains, while self-esteem can be defined as an evaluation of the self-concept which includes an emotional component (Fox, 1999; Harter, 1999; Sigelman & Rider, 2018).

Harter (1999, 2012) suggests that self-concept helps to explain what I am, whereas self-esteem can be defined more in terms of how good I am.

For the purpose of this study it was decided to make use of Rosenberg's (1965) Self-Esteem scale (RSE) which measures global self-worth by measuring both positive and negative feelings about the self. It is hypothesised that in order to gain a more holistic understanding of self-esteem within the university student population, one needs to use a construct which measures self-esteem in the broadest sense possible. Thus, measuring students' global self-worth will offer a good representation of how they perceive themselves across most environments encountered within their specific developmental stage.

In one study, a clear distinction was put to the fore and emphasised by clearly defining what is meant by global and specific self-esteem (Rosenberg et al., 1995). According to Rosenberg et al. (1995), global self-esteem can be defined as aspects related more with measures of psychological well-being, whereas specific (academic) self-esteem can be more readily related as an effective predictor of academic performance. Initially, Rosenberg (1965) defined global self-esteem as an individual's self-liking or the degree to which one believes that one is good enough. He later refined this definition to "the totality of the individual's thoughts and feelings with reference to himself as an object" (Rosenberg, 1979, p. 7). He further extends this statement by dividing self-esteem into three broad categories, by distinguishing between the way in which (1) the individual views him- or herself, (2) the idealized-self and, (3) the self presented to the public (Rosenberg, 1979). It is hypothesised that there is a universal paradoxical human need in which human beings have an innate desire to maintain a stable self-concept whilst at the same time having to process new, sometimes dissonant information about the self and its functioning (Rosenberg, 1979). It can be concluded from this hypothesis that self-esteem might fluctuate across time as human beings attempt to harmonise the constant feed of information they receive from their

various environments with the three broad categories in which Rosenberg (1979) divides self-esteem.

Rosenberg (1965) developed the RSE as a unidimensional or one dimensional construct which measures global self-esteem. In light of the strong evidence for this finding, it is acknowledged as such by this dissertation (Franck, De Raedt, Barbez, & Rosseel, 2008; Gnambs, Scharl, & Schroeders, 2018; Schmitt & Allik, 2005). However, an ongoing debate that has existed for more than 50 years post the RSE's development proposes the RSE to rather be a two-dimensional construct (Fukudome et al., 2017; Marsh, Scalas, & Nagengast, 2010; Michaelides, Koutsogiorgi, & Panayiotou, 2016). Scholars for this argument suggest that the RSE subsumes items to which respondents can answer in one of two ways, namely: (1) approving positive self-image or (2) denying negative self-image, which in their view ultimately explains global self-worth (Fukudome et al., 2017). Despite the ongoing debate of the dimensionality of the RSE, the present study functioned from the viewpoint that the RSE measures global self-esteem from a one-dimensional approach.

Finally, one derives a sense that high self-esteem is synonymous with positive self-evaluation while low self-esteem is closely associated with negative self-evaluation (Potgieter, 2012; Suzuki & Shunsuke, 2013). Self-esteem is suggested to influence both attitudes and actions of a person and furthermore links people with high self-esteem to behaviours in which they are portrayed to be more likely to pursue goals actively and aggressively (Suzuki & Shunsuke, 2013). Self-esteem is also regarded as an indication of psychological well-being (Potgieter, 2012). Therefore, the influence of various factors on self-esteem as well as the role of self-esteem on other variables are believed to play a significant role in various domains of human functioning. These and other aspects will be discussed in the subsequent sections.

2.2.3 Self-Esteem from a Normal Developmental Perspective

From a normal developmental perspective, it is suggested that self-esteem develops gradually from early childhood with various theoretical models offering different perspectives specifically on how this process takes place (Kerig, Ludlow, & Wenar, 2012; Sigelman & Rider, 2018). One can formulate an in-depth discussion based merely on the development of self-esteem throughout the life span, including aspects such as object relations theory as explained by Margaret Mahler and her colleagues (1971; Mahler, Pine, & Bergman, 1975) as well as those of other theorists. However, this is not the purpose of this study. Various researchers suggest that self-esteem develops from being very concrete and self-focused to being more abstract, as if moving through a series of stages parallel to the cognitive and emotional development all human beings undergo (Kerig et al., 2012).

Self-esteem has been projected by previous researchers as being a U-shaped process (Cai, Wu, Luo, & Yang, 2014; Meyer, 2008). Researchers suggest that self-esteem displays a tendency to rise during childhood and then gradually declines during adolescence before rising again in young adulthood (Cai et al., 2014; Meyer, 2008). Gender differences have also been identified as fluctuations in self-esteem during this time period, and are reported to affect girls more than boys, with adolescent females experiencing a more pronounced decrease in self-esteem than boys (Cai et al., 2014; Meyer, 2008). In keeping with these empirical findings, Jeffrey Arnett (2007a) agrees with the hypothesis as stipulated above, and also states that self-esteem tends to display an increase during the stage of emerging adulthood, after the decrease found in adolescence. This marks the developmental stage in which most university students as well as the individuals who participated in this study forms part of. As individuals in the emerging adulthood stage of development are suggested to be capable of formal- or even post-

formal operational thoughts (Inhelder & Piaget, 1958, 2013), one could hypothesise that if stressors from the environment do not affect their ability to think rationally, one would expect these individuals to develop a healthy self-esteem. One also needs to consider that as emerging adults acquire the ability to reflect upon oneself, draw social comparisons, and reason in increasingly abstract and complex ways, some people might find it difficult to develop a stable self-esteem if multiple stressors without sufficient resources are present. One can draw the conclusion that self-esteem tends to develop gradually during childhood, then decreases in adolescence, before finally rising again during emerging adulthood and finally stabilises towards the end of this developmental stage. Therefore, although the individuals who participated in this present study may find themselves having low levels of self-esteem initially, their levels of self-esteem may continue to rise within the next few years (Arnett, 2007a). Depending on multiple factors that influence self-esteem and the resources that these students have at their disposal, an increase in self-esteem is suggested to occur according to the literature (Arnett, 2007a; Cai et al., 2014; Meyer, 2008). Consider the following paragraph as it sets out to explain some of these contributing factors.

2.2.4 Factors Influencing Self-Esteem

Self-esteem among university students has been found to be significantly affected by various factors (Haq, 2016). Some of the factors that play a role include sociodemographic factors (Erşan, Doğan, & Doğan, 2009; Haq, 2016). Rosenberg (1979) suggests that sociodemographic factors such as race, religion, social class, significant others in one's life, neighbourhood and school are not the distinguishing influences in one's self-concept per se, but rather the person's interpretation of them. The present study includes gender as a possible contributing factor that could play a role in the self-esteem of participants. As part of the above-mentioned perspective,

Rosenberg (1979) further suggests that we should move beyond merely perceiving self-esteem from a sociological perspective. He adds that cognitive aspects related to this construct should be explored as well (Rosenberg, 1979). Harter and Leahy (2001) agrees and adds to this discussion by suggesting that physical appearance, for example, is a significant factor affecting self-esteem among others. More recent research studies confirm the hypothesis that physical appearance tends to have significant effects on self-esteem across the life span (Frederick, Sandhu, Morse, & Swami, 2016; Narae, 2018). As gender is hypothesised to play a significant role within the variables under investigation in this study, the following paragraphs reflect on the role of gender and other prominent contributing factors and their effects on self-esteem.

One of the foremost issues under discussion in the literature concerns the issue of gender differences and self-esteem among university students (Collison, Banbury, & Lusher, 2016; Haq, 2016; Zuckerman, Li, & Hall, 2016). Despite normal developmental trends accounting at least in some part for these discrepancies, other factors are also hypothesised to play a role. Haq (2016) suggests that a significant difference exists on the basis of gender when assessing self-esteem in university students. According to his study, males were found to exhibit significantly higher levels of self-esteem than their female counterparts (Haq, 2016). Multiple other studies compliment this hypothesis as these researchers also found males to generally display higher levels of self-esteem than females who fall within the late adolescence to young adulthood age range (Bleidorn et al., 2015; Collison et al., 2016; Haq, 2016; Sprecher, Brooks, & Avogo, 2013). In keeping with these results, males have been found to be unaffected in terms of self-esteem when considering the role of socioeconomic status (SES) (Ye, Yu, & Li, 2012). However, females' self-esteem is suggested to be significantly affected by the role of SES (Ye et al., 2012). One can denote from these findings that a significant difference between males and females in terms of self-esteem exists. In addition, the likelihood of different factors affecting

self-esteem in both males and females might be high as males and females' self-esteem are hypothesised to be influenced by different factors.

Research conducted by Shan, Fu, Tian, and Wang (2016), add to the above-mentioned findings as results from their study indicate that significant gender differences exist among university students when compared on the basis of self-esteem. In addition, these researchers conjecture that other aspects such as academic marks, types of families and individual lifestyles significantly affected self-esteem in university students. Factors such as age, family income, medium of instruction, student monthly expenditure and area of residence is furthermore thought to directly affect self-esteem in university students according to Haq (2016). A previous study conducted by Erşan et al. (2009) is in agreement with these results as these researchers report that sociodemographic factors such as age and earning a higher income play a significant role with regard to the level of self-esteem in students. This makes sense considering that students are capable of formal operational thought which enables them to draw social comparisons across multiple domains of human functioning as it was explained earlier (Harter, 2012; Inhelder & Piaget, 1958, 2013). Moreover, Veselska et al. (2010) propose that sociocultural factors such as media, mental health, personality, SES and social support all play a significant role in affecting self-esteem. Taking this information into consideration, one notes various factors that play a role with regard to self-esteem within this specific population and thus the complexity of discussing constructs individually is furthermore reiterated.

It is said that use of social media platforms such as Facebook, Instagram and others have increased substantially over recent years, with one third of the world's population suggested to be active on social media (Andreassen, Pallesen, & Griffiths, 2017; Hawi & Samaha, 2016;

Sanfilippo, 2015). Although no unanimous verdict has been reached regarding the possible effects that social media has on self-esteem, studies suggest that more time spent on social media correlates with significantly lower levels of self-esteem (Schwartz, 2011; Vogel, Rose, Okdie, Eckles, & Franz, 2015). Schwartz (2011) suggests that some individuals attach significant meaning to what they post and how others react to those posts. Exposing oneself to inappropriate judgement and interference from others via social media platforms is suggested to make one vulnerable to how one comprehends and gains meaning from one's life (Al-Ghafri & Al-Badi, 2016). As will be discussed later, comprehensibility and meaningfulness forms part of the construct of SOC (Antonovsky, 1979, 1987). Hence, it can be suggested that the probability of obtaining a direct link between SOC and self-esteem among university students is realistic. Keeping the definition of self-esteem as defined by Rosenberg (1979) in mind, it bears logic that self-esteem could be affected by platforms such as Facebook (Schwartz, 2011). These platforms make social comparisons exceptionally easy and it is therefore hypothesised that this may lead to university students having less positive thoughts and feelings about themselves (Hawi & Samaha, 2016; Lewallen & Behm-Morawitz, 2016; Woods & Scott, 2016).

Although an integrative section on all three constructs of this study is yet to follow, it is deemed necessary to comment on the correlation between physical activity and self-esteem briefly within this section. Various studies have found a significant relationship to exist between self-esteem and physical activity within different age groups and not merely within young or emerging adults (Cekin, 2015; García González & Froment, 2018; Lages, Emygdio, Monte, & Alchieri, 2015; Moral-García, Orgaz García, López García, Amatria Jiménez, & Maneiro Dios, 2018). It is therefore worthwhile to take note of the hypothesis that physical activity is believed to play a critical role in the level of self-esteem found among university students. However, it is hypothesised that numerous confounding variables such as gender and body-image/physical

appearance and possibly SOC may play a role within this relationship, which would certainly affect this correlation (Moghadam et al., 2018; Shan et al., 2016; Swanepoel, Surujlal, & Dhurup, 2015).

2.2.5 The Role of Self-Esteem on Other Psychological Factors

It is a commonplace that self-esteem can play a role in significantly affecting various factors within different population groups, including those of students (Yiğiter & Hardee, 2017; Sowislo & Orth, 2013). Self-esteem is suggested to have a significant impact on many important life outcomes such as health, work and relationship factors (Orth, Robins, & Widaman, 2012; Swann Jr., Chang-Schneider, & McClarty, 2007; 2008). In a recent study it was found that the extent to which locus of control has an effect on various domains of human functioning, is fully mediated by self-esteem, suggesting that one's beliefs about control plays a role in one's beliefs about self-esteem (Kurtović, Vuković, & Gajić, 2018). From this result one can thus hypothesise that if one believes that one has control over one's environment, one might have a higher level of self-esteem. This effectively correlates with the theory of SOC which will be discussed later in this chapter (Antonovsky, 1979). It is suggested when analysing the literature that the level of self-esteem for example, effectively determines the effect self-esteem has on other factors (Aboalshamat et al., 2017; Hennig Silva & Mendes Vieira, 2015; Sowislo & Orth, 2013). For example, various authors have found that increasing students' self-esteem can play a significant role in protecting individuals from developing forms of psychopathology or even in decreasing levels of it (Aboalshamat et al., 2017; Sowislo & Orth, 2013; Yiğiter & Hardee, 2017). Another study has identified self-esteem to be at least one of the factors that can assist in explaining a significant portion of variance with regard to adjustment to university and academic performance in university students (Petersen, Louw, & Dumont, 2009). In a recent study conducted by Lau,

Chan, and Lam (2018), findings suggested that self-esteem acts as a significant mediator on the relationship between social support and adjustment to university activities in students. One can hypothesise that having greater social support increases the level of self-esteem in university students whereby it possibly creates a larger sense of control over one's environment (Harter, 2012; Lau et al., 2018). One can furthermore hypothesise that a possible significant relationship between self-esteem and SOC may exist as the latter construct can also assist in explaining effective control over one's environment (Antonovsky, 1987). The following paragraphs investigate and discuss topics related to self-esteem and psychopathology/mental health in greater detail.

With self-esteem considered to be a psychological construct, one can suggest that it effectively deals with mental (psychological) health, whereas physical activity is suggested to deal more with physical health. Keeping in mind that this study's aim is to determine the role of SOC on the relationship between physical activity and self-esteem, and SOC is also suggested to hold relevance to mental health (Antonovsky 1979, 1987), the following section selectively discusses the aspect of mental health and self-esteem. Various studies suggest that higher levels of self-esteem correlate with decreased levels of depressive symptoms among university students (Sakellari et al., 2018; Sowislo & Orth, 2013; Yiğiter & Hardee, 2017). The same results were obtained in another study which indicated that low levels of self-esteem have been found to correlate with stress, anxiety and depression (Aboalshamat et al., 2017). In keeping with the student population, Hennig Silva and Mendes Vieira (2015) found that high levels of self-esteem counteract against burnout in postgraduate students. Reflecting even further, higher self-esteem has been associated with higher SOC in the student population (Skodova & Lajciakova, 2013). Evidence therefore suggests that higher self-esteem seems to be correlated significantly with more positive outcomes, whereas low levels of self-esteem appears to be more related to

negative, or less positive outcomes in a wide variety of domains of human functioning. It can be hypothesised that higher levels of SOC significantly influences the level of self-esteem that university students experience as the three components it consists of ultimately relate back to mental health of which self-esteem forms part of.

Reflecting on aspects that might be of clinical relevance especially with regard to the population under investigation for this study (namely that of the UFS), self-esteem has been found to be significantly correlated with aspects such as academic performance (Arshad, Zaidi, & Mahmood, 2015; Rosli et al., 2012). This correlated well with Rosenberg and his colleagues' (1995) idea of specific self-esteem as mentioned earlier. However, although this holds relevance to the broader construct of self-esteem and the role it plays in relation to other variables, one should keep in mind that for the purpose of this study, global self-esteem was measured. Therefore, not specifically examining the role of self-esteem and academic performance, but rather just stating the link between these two aspects for the student population that was used.

From a more physical/behavioural perspective, it has been noted earlier already that males and females are motivated by different aspects when conceptualising their willingness to engage in physical activity (Lages et al., 2015). It is suggested that self-esteem and motivation are significantly related within the student population. Finally, self-esteem was found to be a significant factor which affects motivation in both students who engage or who do not engage in regular physical activity (Lages et al., 2015). Thus, it is of high importance to take note that not only may physical activity influence self-esteem levels in students, but self-esteem might also play a role in the amount of physical activity that students engage in (Lages et al., 2015). The role of self-esteem is therefore hypothesised to extend to various aspects relating to important areas of functioning when analysing the student population.

2.2.6 Conclusion

Considering the findings reported in the afore-mentioned paragraphs, one can denote that self-esteem is a complex and interrelated construct. Piaget's normal developmental theory assists us in obtaining a logical idea regarding how self-esteem develops across the human life-span with special consideration extended to the emerging adulthood stage of development. However, it also explains the vast individual process of each human being and how both genetic and environmental factors can affect our self-esteem. Nonetheless, multiple aspects are suggested to play a role in the level of self-esteem one eventually develops, of which some of the most prominent ones were discussed. This discussion effectively attempts to portray self-esteem as holistically as possible whilst considering the many contributing factors of our present day and age amongst university students. Finally, the discussion surrounding how self-esteem influences other factors and the significant effects thereof sees the conclusion of this section as it also offers a comprehensive outlook on the vast effect self-esteem can have in human functioning. The next subdivision offers an in-depth discussion surrounding the construct of SOC.

2.3 Sense of Coherence

2.3.1 Introduction

This section offers an in-depth discussion regarding the construct of SOC. The initial paragraphs provide an explanation regarding the origins of SOC and how this construct was initially developed as well as giving an explicit description of the theory on which SOC is built. This section further elucidates the broader perspective of SOC and Antonovsky's perception of the construct. The student population is considered in line with SOC and is done so by reflecting

on aspects such as well-known normal development. This synthesis helps to better explain possible variability in SOC across time. Finally, the South African context and other aspects relevant to SOC are considered, which further assists the reader to fully grasp the nature of SOC from a multicultural perspective whilst also taking into account criticisms against the construct.

2.3.2 Historical Overview

The term SOC can be described as *forming part of a larger construct* called salutogenesis (Antonovsky, 1987, 1993). Salutogenesis is derived from the Latin word *salus*, meaning health, and the Greek word *genesis*, meaning origin (Antonovsky, 1979). Thus, salutogenesis is a term used to describe the question surrounding the origins of health (Antonovsky, 1979, 1987). An enormous amount of research has been conducted in the medical field regarding the investigation of factors that contribute or lead to disease (Endo, Kanou, & Oishi, 2012). However, in keeping with the current emphasis on preventative health, recently in a world-wide trend, researchers have started shifting their attention towards salutogenesis more and more, or rather the theory that examines why certain individuals manage to stay healthy (Endo et al., 2012; Kichbusch, 1996). Furthermore, this theory focuses on the maintenance and promotion of health (Endo et al., 2012; Kichbusch, 1996). Failing to include aspects such as personal strengths and other resources by conducting research in a more conservative and traditional manner through focusing on mental illnesses and susceptibility to pathogens, undermines the development of the holistic human potential (Barnard, 1994; Riley & Janosky, 2012). Hence, the shift in focus towards a salutogenic and fortigenic (the origin of strengths) orientation in research is suggested to be the future in studying human behaviour. In order to fully grasp the nature, extent and dynamics of SOC, one needs to take into consideration how this construct was developed. Thus, the

following discussion explores how SOC originated and developed over time until present and provides an in-depth analysis of aspects related to it.

2.3.3 Development of SOC

This salutogenic model arose from Antonovsky's (1979) observations which originated by comparing females who lived in severe conditions in German concentration camps to the conditions of those of a control group who did not have this experience. He found that 29% of women who were kept in these concentration camps still managed to maintain a positive mental health state as opposed to the 51% of women in the control group, despite their exposure to these severe circumstances. Antonovsky (1979) found SOC to play an essential role in enabling people to maintain a positive mental state, good psychological health and providing the ability to cope when having experienced extreme trauma or other life stressors.

As mentioned above, SOC forms part of a salutogenic health model (Antonovsky, 1987, 1993). This theoretical model (SOC) was developed in order to explain maintenance or improvement of location on a health ease/dis-ease continuum and to expand the understanding of stressors, coping, and health (Antonovsky, 1993). Antonovsky (1979, p. 52) defined "health" as follows: "health is a state of complete physical, mental, and social well-being." In addition, mental health has been defined as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community (Herrman, Saxena, Moodie, & World Health Organization, 2005, p. 12)." Thus, in line with these definitions, Antonovsky (1987) believed that health is not merely the absence of disease or pathogens, but rather that health is being in a positive state. Moreover, Antonovsky (1987, p. 7) suggests that the assumption that

"stressors are inherently bad" is incorrect. Instead, he proposed the assumption that coming into contact with a stressor causes a state of tension in a person that needs to be managed (Antonovsky, 1987). Depending on the individual's adequacy to effectively manage this state of tension, the outcome can vary between being pathological, neutral or positive (Antonovsky, 1987). In keeping with the above-mentioned definition of what constitutes *mental health,* one can suggest that having a strong SOC is synonymous with being in a good mental state. Furthermore, it could mean that one is in a positive health state.

In addition, this argument/hypothesis further leads to another term related to SOC called *fortigenesis* which can be explained as follows: fortigenesis refers to the origin of strengths (in Latin *fortis* equates to *strong*), whereas salutogenesis refers to the origin of health (Antonovsky, 1979; Strümpfer, 1995, 2005). Fortigenesis can thus be described as referring to the process of generating strength at multiple endpoints than health alone (Strümpfer, 2005). This denotes identifying multiple/different strengths that one comprises of, other than health. Multiple factors in everyday life called stressors can moderate the status of one's health (Brannon et al., 2014). However, human beings have developed and acquired resources to combat or work against these stressors as a means to maintain a level of homeostasis in their overall health status (Brannon et al., 2014). Examples of such resources include social support and personal strengths such as personality traits and healthy lifestyles which will be elaborated on in the section related to General Resistance Resources (GRR's) (Brannon et al., 2014; Mc Elroy & Hevey, 2014).

With this in mind, Antonovsky (1987) proposed the hypothesis that a high level of SOC is a prerequisite for successful adaptation to stressful events. He later elaborated on this hypothesis by suggesting that having a high SOC leads to improved health and well-being or quality of life. In recent studies, this hypothesis is supported (Apers et al., 2015; Stock, 2017). However, further research derived from an integrative review of recent studies suggests that people with

access to GRR's tend to have higher SOC and therefore also have better health and overall quality of life, but more research on this topic is recommended (Stock, 2017; Tan, Vehviläinen - Julkunen, & Chan, 2014). While some studies support the SOC theory mentioned above, other studies have demonstrated similar results, yet offer an alternative perspective. These studies indicate that while a low SOC reflects vulnerability for psychiatric morbidity for disorders such as depression and anxiety, higher levels of SOC can serve as a protective factor against such disorders (Burger, Tektas, Paulsen, & Scholz, 2014; Ponarovsky, Amital, Lazarov, Kotler, & Amital, 2011; Välimäki, Vehviläinen-Julkunen, Pietilä, & Pirttilä, 2009). This further strengthens the argument for the positive outcomes related to having a higher SOC. Several studies have found results in support of this hypothesis which suggests that a high SOC reflects more than just the absence of psychopathology (Kouvonen et al., 2010; Langius-Eklöf & Samuelsson, 2009). Consequently, strong evidence in the literature supports the hypotheses that a higher SOC can result in having a stress-buffering effect against various life-stressors versus the possibility of SOC as a direct determinant of health (Antonovsky, 1987, 1996).

SOC, although portrayed as being a unidimensional construct, consists of three independent, yet, interrelated components (Antonovsky, 1993). These components are what Antonovsky (1979, 1987) believed to be essential in determining one's position on the health ease/dis-ease continuum and will therefore be discussed next. This discussion aims to provide a brief, yet fundamental, understanding of each of the three different components as proposed by Antonovsky.

2.3.4 Components of SOC

Antonovsky (1993) proposed the hypothesis that SOC can be depicted as being a "global orientation" (p. 19) to life, health and wellbeing. He describes it as the extent to which one has a pervasive, long-lasting yet vibrant feeling of confidence that: (1) the stimuli one derives from both one's internal and external environments, meaning the life events one faces, are structured, predictable, and explicable ["comprehensible"], (2) that one has the resources available to cope with the demands of these events ["manageable"], (3) and that these demands are meaningful and worthy of engagement and investing resources into them ["meaningfulness"] (Antonovsky, 1993, p. 19). In effect, the theory of SOC also correlates with the view of Lazarus and Folkman (1984; Lazarus, 2000) regarding stress. Lazarus and Folkman (1984; Lazarus, 2000) hypothesised that stress results from an imbalance between one's appraisal of the demands from one's environment and the resources available to effectively cope with these demands. From their and Antonovksy's (1993) perspectives, it is clear that being able to identify that one has adequate resources available to meet the demands is a crucial factor in decreasing the role of stressors (Lazarus, 2000; Lazarus & Folkman, 1984;). Moreover, SOC is also important to consider when attempting to increase one's health and position on the health/disease continuum (Antonovsky, 1993; Lazarus, 2000; Lazarus & Folkman, 1984). Furthermore, SOC can be described as having the ability to recognize that one can cope in any situation irrespective of whatever is happening in life (Antonovsky, 1979, 1987, 1991, 1993; Gambetta-Tessini, Mariño, Morgan, & Anderson, 2016; Lindström & Eriksson, 2006). The three core components of SOC already mentioned can thus be defined as follows:

2.3.4.1 Comprehensibility

Consistent and stable life experiences offer the basis for the component of comprehensibility. Antonovsky (1979) implies that an individual's internal and external environments are perceived

as predictable, structured, rational and consistent. Furthermore, transpiring events are therefore viewed as being understandable and making sense to the individual. This component suggests that the extent to which stimuli will be ordered and predictable in the future is based on how stable and consistent past experiences of the individual have been. Therefore, comprehensibility signifies the degree to which an individual perceives both internal and external stimuli as predictable, structured, ordered and as making cognitive sense (Korotkov, 1998; Mayer, 2014). In other words, this can be defined as being the cognitive component of SOC. According to Antonovsky (1979, 1987), accidents and awful events are inevitable, yet a person with a high comprehensibility rating is less likely to display reluctance to enter into an open-ended situation due to his/her confidence that sense and order can be derived from it.

2.3.4.2 Manageability

This component is demarcated as having confidence in oneself that one has the necessary resources available personally or from significant others, such as social support networks or resources controlled by God or a spiritual entity, and that these resources are sufficient to meet the demands posed by one's internal and external environment (Antonovsky, 1979, 1987; Strümpfer, 2005). It is commonly found in the literature that this component is referred to as being the behavioural/instrumental component of SOC (Langham, Russell, Hing, & Gainsbury, 2017; Lindström & Eriksson, 2005; Shilpa et al., 2016). An individual who rates high on this component is less likely to perceive himself/herself as being a victim of circumstance should the individual feel that adequate resources to meet the demands posed by internal and external stimuli are at his/her disposal (Antonovsky, 1987). Furthermore, he/she has a decreased probability to feel threatened by events or activities of daily living or that life is treating him/her unjustly (Antonovsky, 1987; Bergman, Malm, Ljungquist, Berterö, & Karlsson, 2012).

2.3.4.3 Meaningfulness

According to Antonovsky (1987), meaningfulness denotes the motivational component of SOC. This component refers to the emotional identification with various stimuli in an individual's environment and magnitude to which an individual is convinced that life makes sense emotionally (Antonovsky, 1979). In addition, meaningfulness relates to the degree to which the individual perceives himself/herself to be the main role-player in governing his own daily experiences (Antonovsky, 1979). Lindmark and Abrahamsson (2015) describe meaningfulness as the "driving force" (p. 62) behind an individual's actions, whereas other authors prefer to call it the emotional counterpart to the cognitive component of SOC (Kjällman Alm, Hagglund, Norbergh, & Hellzén, 2015). This component thus reflects one's ability to be of the belief that demands from one's environment are challenging yet worthy of personal investment (Antonovsky, 1979).

In essence, these three components can be described as *what signifies having a coherent and holistic understanding of the world*. Antonovsky (1979, 1987) suggested that SOC can be explained as being a type of cognitive and emotional appraisal style which is associated with facilitating effective coping, health-enhancing behaviours and better social adjustment in human beings. In the works of Antonovsky (1992), it is clear that he suggests that having a high SOC is linked to feeling cognitively and emotionally adequate in order to organise and manage problems as they arise and being willing to confront them. Moreover, having a high SOC is hypothesised as such, in that a person is more likely to be evaluated as being healthy on the health/disease continuum in comparison to a person who has a low SOC.

According to the theory of SOC, one can conclude from this discussion that both stressors/environmental demands as well as various resources are at play. Antonovsky (1979) distinguished between General Resistance Resources (GRR's) as well as Specific Resistance

Resources (SRR's) to refer to different resources that individuals use to meet the demands of the stressors posed by their environment. However, for the purposes of this study only a discussion surrounding GRR's will be given to further elaborate on the construct of SOC.

2.3.5 General Resistance Resources (GRR's)

Antonovsky (1979, 1987) suggested that SOC can be described as being a type of appraisal style that involves both cognitions and emotions associated with aspects such as effective coping, health-enhancing behaviours and better social adjustment. According to Antonovsky (1979), the concept of GRR's further helps to explain why certain people manage to maintain their psychological health despite their experiencing of adverse events or circumstances. Antonovsky (1979) describes a GRR as any characteristic of a person, group, subculture or society that facilitates evading or battling of a wide variety of "stressors" (p. 81). Therefore, one can more generally define GRR's as protective factors against stressors found in the different systems that individuals find themselves in on a daily basis.

Antonovsky (1979) identified different categories of GRR's, which include the following:

- physical and biochemical resources;
- artificial resources such as material (wealth, money, status), cognitive (knowledge, intelligence), emotional (ego-identity) and value-established resources (coping strategies);
- interpersonally related resources such as friendships and social support, or macro-socio-cultural resources such as culture, individual beliefs and politics.

Recent evidence in the literature agrees and adds to this discovery by suggesting that GRR's can be subdivided into three different ecological levels, namely: individual, family and

community level (Idan, Eriksson, & Al-Yagon, 2017). The individual level includes aspects such as "emotional closeness and attachment relationships" (p. 58), "personal characteristics and resources" (p. 60) such as demographics and personality, and the "individual's social support" and "genetic factors" (Idan et al., 2017, p. 61). On the family level it includes aspects related to "parental resources", the "family's demographic resources", and the "family climate factors" (Idan et al., 2017, p. 62). Finally, on the community level one can identify the "school setting" and "community features" such as having a sense of belonging to the community/group to play a role as GRR's in SOC (Idan et al., 2017, p. 64). A clear understanding can be drawn from the above evidence regarding what is implied by GRR's, however the dynamics, or how GRR's play a role in relation to other variables, still requires some explanation.

Mittelmark et al. (2017) solves this issue by offering a simplistic yet well-formulated description regarding the dynamics of GRR's. According to Mittelmark et al. (2017), if one identifies something as a stressor, tension is created from which one's intention to potentially utilise GRR's or perhaps SRR's is aroused through activity and emotion. It can therefore be stated that the study was conducted from the perspective that different people experience various forms of stressors, yet possess different GRR's which enable them to effectively avoid or resolve the stressors that they face in their lives (Antonovsky, 1979; Strümpfer, 1990, 1995). According to Strümpfer (2005), individuals continuously wax and wane on a continuum of being completely free of mental illness to having the pure form of a specific mental illness. Strümpfer (2005) suggests this hypothesis by proposing that individuals are affected by both positive aspects (subjective and external) and eustress experiences. These aspects comprise of: continuing education, being involved in a loving relationship, psychotherapy and participation in self-fulfilling activities. Furthermore, Strümpfer (2005) adds to his hypothesis by suggesting that negative or distressing experiences such as: serious illness, bereavement or any other untoward

events also play a significant role. Hence, a person's GRR availability is suggested to play a role in his/her position on the health ease/dis-ease continuum (Antonovsky, 1987). According to Antonovsky (1979), based on the position where a person is situated on this continuum it can either be beneficial or limiting regarding their status of salutogenesis. This consequently depends on the individual's past experiences with stressors (Antonovsky, 1979). SOC therefore differs from other traditional, more conservative models regarding stress and coping (Antonovsky, 1979). SOC does this by accentuating the fact that stress alone may not always play a fundamental role and cause detrimental outcomes for individuals experiencing a certain level of stress (Antonovsky, 1979).

In keeping with this, one can gather from these empirical results that if one is capable of making sense of one's environment, has confidence from past experiences that one has the necessary resources available to meet the demands posed by one's environment, and finds it meaningful to invest one's resources into overcoming these challenges, one can be thought of having a strong SOC.

However, although Antonovsky (1979, 1991) found that SOC plays a role in assisting individuals to maintain a positive mental health status despite having experienced stressors, he also found that SOC tends to fluctuate over time. Many avenues of research spawned from these findings to establish the aetiology for this trend, some of which included viewing SOC as a personality trait (Antonovksy, 1987, 1991; Costa & McCrae, 2009; Eriksson & Lindström, 2005; Grevenstein & Bluemke, 2015; Hochwälder, 2012; Kövi et al., 2017; McCrae & Costa, 2003, 2008). Other possible causes considered in this study include a discussion regarding the role of normal developmental theories which will be discussed next.

2.3.6 SOC and Stability Over Time

2.3.6.1 SOC as a Personality Trait

From the works of Antonovksy (1987), it is clear that he perceived SOC to be similar to a personality trait that assists in explaining people's global perspective of life. In recent studies that investigated the correlation between SOC and personality, specifically the five-factor model of Costa and McCrae (2009; McCrae & Costa, 2003, 2008), and alternative versions of this model, it was found that SOC is associated with all five of the factors (at least to some extent). Additionally, its positive relationship with emotional stability can be included (Grevenstein & Bluemke, 2015; Hochwälder, 2012; Kövi et al., 2017). Kövi and his colleagues (2017) found that SOC is significantly related to decreased levels of neuroticism, sensation seeking, hostility, and increased levels of extraversion and activity. The theory underlying SOC suggests that SOC continues to develop throughout adulthood until approximately age 30 after which it stabilizes (Antonovsky, 1987).

In a later study conducted by Antonovsky (1991), he proposed that SOC continues to develop throughout adolescence and tends to stabilize during early adulthood or approximately at the onset of working life. Still he claims that multiple factors affect the stability and extent to which SOC develops over the life course, which include factors such as childhood conditions, economic conditions, social relations and social class during adulthood (Antonovsky, 1987). When this stable/steady state is reached, SOC only fluctuates due to fundamental life events that occur (Antonovsky, 1987). While the results of certain studies are inclined to agree with this (Eriksson & Lindström, 2005), other studies suggest otherwise by proposing that SOC has a component which relies on factors such as an individual's physical and mental state, as well as societal changes, which tend to fluctuate over time (Nilsson, Holmgren, Stegmayr, & Westman,

2003; Vastamäki, Moser, & Paul, 2009). It is thus clear that the debate to determine the stability of SOC over time is still ongoing.

2.3.6.2 Normal Developmental Perspective and SOC

2.3.6.2.1 Erikson's Psychosocial Stages

As demonstrated by the above evidence, it is clear that no one has been able to establish specific factor(s) that can account for the instability of SOC over time. Hence, another possible avenue that can be explored includes analysing the role of normal developmental theories in this equation. Considering Erik Erikson's psychosocial theory, it is difficult to discuss the population group selected for this study according to a single stage (Erikson, 1963, 1968, 1982). This is primarily due to the fact that the individuals who participated in this study can be found in both the psychosocial stages, termed *identity vs. role-confusion* and *intimacy vs. isolation* (Erikson, 1963). Erikson's theory is based on the notion that individuals are faced with specific conflicts at each life stage and that successfully resolving these conflicts leads to the development of a specific virtue (Erikson, 1963, 1968, 1982). In the case of the two life stages mentioned above, the individuals who participated in this study could be suggested to acquire the virtues of *fidelity:* in which their psychosocial task would entail integrating different aspects of oneself as a unique person; and *love*: in which caring for another without losing the self and engaging in work commitments would be the goal (Erikson, 1963, 1968, 1982). Whether or not an individual is able to successfully resolve the conflicts found in each stage of life or not, he/she is pushed by both biological/maturational and social/environmental forces into the next stage (Erikson, 1963, 1968, 1982). Erikson's theory also assumes a stance from the epigenetic principle which suggests that failing to successfully resolve a conflict at any life stage predisposes an individual to ultimately fail in successfully resolving conflicts at subsequent life stages (Erikson, 1950, 1953). Erikson (1950, 1953) believed that people are active in influencing and being influenced

by their environment and thus perceived humans to possess the ability to be able to overcome the effects of harmful experiences in early life. He placed large emphasis on development, especially during adolescence, and viewed human beings as dynamic and adaptive to their environments (Erikson, 1963, 1968, 1982).

Consequently, one can already start to draw parallels between the theories of Erikson and Antonovsky. Both theorists depart from the stance that "psychosocial conflicts" (according to Erikson) and "stressors" (according to Antonovsky) experienced by individuals are not inherently bad. Instead, it rather depends on the individual's capability to successfully overcome/manage these "psychosocial conflicts" or "stressors" and relieve the state of tension created by them. Keeping in mind what was mentioned earlier, depending on the individual's adequacy to control these undesirable conditions or events, the outcome can vary from being pathological, positive or neutral in both theories (Antonovsky, 1987; Erikson, 1963, 1968, 1982). The difference between these two surprisingly similar theories that one needs to keep in mind is as follows: according to Erikson (1963, 1968, 1982), successfully resolving psychosocial conflicts leads to successful ageing (developmental theory), whereas according to Antonovsky (1987) effectively managing the state of tension created by single/multiple life stressors can effectively cause a person to have a positive outcome and therefore increased levels of SOC.

From this perspective it is suggested that SOC might therefore be able to develop in accordance to the theory as proposed by Erikson (1963, 1968, 1982) when considering a life-span approach. Expanding on this, it is suggested that SOC can fluctuate across the life-span as individuals are influenced by different psychosocial conflicts that need to be resolved, as well as other factors mentioned above. As a result, it is hypothesised that based on the individual's intrinsic ability and access to GRR's, he/she could develop a higher SOC through successfully resolving psychosocial conflicts and forging a stable identity.

2.3.6.2.2 Arnett's Emerging Adulthood Theory

According to Jeffrey Arnett (2000, 2014a) individuals between the ages of 18-25 can be described as emerging adults. In contrast to Erikson's (1963) psychosocial theory of development, Arnett (2000, 2014b) suggests that there is a life stage in between adolescence and young adulthood. However, Arnett (2000, 2014b, 2016) agrees with Erikson (1963) by which he states that this is a phase of life in which much identity exploration occurs. He further suggests that emerging adulthood is a phase of life that is subjectively and demographically distinct (Arnett, 2000). This life stage is thus a period in time where individuals explore career possibilities, different romantic relationships, various ways of perceiving the world and such (Arnett, 2016). Considering evidence from the literature, it is suggested that not only is there a strong relationship between the constructs of self-esteem and identity especially in emerging adults, but one can identify the tremendous role development as a whole plays in both SOC and self-esteem (Marcia, 1966, 2017; Soenens, Berzonsky, & Papini, 2016). Therefore, the importance of including normal developmental theories to help explain the complex role it plays in both SOC and self-esteem is vital. The following discussion elaborates on this statement by exploring how SOC is possibly influenced by the life stage of emerging adulthood.

Individuals within this age range are hypothesised to experience certain emotions, have certain views and future hopes that might differ from young adults and individuals in other life stages, which makes this specific life-phase very unique (Arnett, 2000). Although Arnett's (2007b) initial studies offered the perspective that emerging adulthood is a phase during which individuals develop improved well-being, later studies offered a much broader view of what this specific life stage entails. For example, in 2012 Arnett and Schwab conducted a study based on 1029 interviews in America via Clark University in which their findings proposed that emerging adults experience many negative emotions such as: feeling depressed, stressed, anxious and

uncertain. Thus, emerging adulthood can be described as being a time during which one has an all-encompassing blend of mixed emotions (Arnett & Schwab, 2012). Arnett (2007a) also states that a moderate degree of ambivalence is present during this life stage as individuals find themselves in a time where new roles are assigned to them which brings along altered responsibilities to which they must adjust. Arnett (2004) distinguished five distinct categories that differentiate this life stage from other life stages, reflecting specifically on aspects such as the new roles and responsibilities that are brought along by this phase. Emerging adulthood can therefore be described as the age of: identity explorations: instability; being self-focused; feeling in-between, and the age of possibilities (Arnett, 2004). Consequently, one can make reference to this unique life stage as being a period in development during which multiple stressors, as Antonovsky (1979, 1987) would describe it, play a role in the lives of these individuals. Thus, the probability of experiencing a state of tension that needs to be managed in order to achieve a level of homeostasis yet again, seems to be significantly increased during the phase of life.

Consequently, this gives rise to at least one of the reasons for this study for investigating individuals who fall into the emerging adulthood life stage and to further investigate the role of SOC in this regard as well. Taking the above-mentioned evidence and hypotheses into consideration, one can begin to understand how this theory contributes to better understanding the construct of SOC. Incorporating other variables such as physical activity and self-esteem together with SOC within this specific life stage offers the opportunity to investigate even more possibilities. This could include aspects such as those that are likely to play a role in the development and stability of SOC. The next paragraph draws on criticisms against the construct of SOC based on evidence found in the literature.

2.3.7 Criticism Against SOC

Originally Antonovsky (1979, 1993) developed the SOC construct to be perceived as unidimensional and this idea has been supported even amongst recent studies (Drageset & Haugan, 2016; Rajesh et al., 2016). Hence, Antonovsky's (1979) early works offer the idea that SOC can be defined as a single individual property or rather a general construct that can be subdivided into three components/dimensions. Yet there is evidence which suggests the contrary, as recent as well as previous studies found in the literature suggest that SOC might rather be a multidimensional construct (Eriksson & Lindström, 2005; Naaldenberg, Tobi, van den Esker, & Vaandrager, 2011; Söderhamn et al., 2015). Despite enormous amounts of later studies, this topic remains an area of wide debate among academics.

Another limitation noted in the literature relates to the meagre evidence currently found in relation to SOC on societal level (Braun-Lewensohn & Sagy, 2011; Eriksson & Mittelmark, 2017). The relevance of conducting research in the field of SOC on community level holds a vast array of possible positive contributions (Eriksson & Mittelmark, 2017). Eriksson and Mittelmark (2017) suggest that a social policy developed from and based on the salutogenic model can assist with dealing with a host of problems. For example, these researchers propose that such a policy could assist in identifying resources for health and well-being in society from past to present, while not excluding risks associated with illnesses (Eriksson & Mittelmark, 2017). These authors emphasise how this knowledge can be used to develop the most efficient measures which can be utilised to resolve current challenges in this regard (Eriksson & Mittelmark, 2017). Other authors agree and add to these findings by proposing that the core of developing such a social policy can facilitate the process of creating synergy and coherence among individuals, groups and organisations in the local community, as well as in society as a whole (Eriksson & Lindström, 2014; Lindström & Eriksson, 2009).

Considering the evidence found in these studies, one can obtain a fair understanding of some of the perceived flaws within the SOC construct. In addition to the above-mentioned criticisms against SOC, other limitations include:

- Practical implications such as that the SOC-29 and SOC-13 measurement instruments are too long and need to be shortened as health survey questionnaires need to be very brief and concise (Eriksson & Mittelmark, 2017).
- Both instruments (SOC-29 and SOC-13) were initially criticised for their alleged shortcomings with regard to their psychometric properties, however more recent evidence suggests that the SOC scale is psychometrically sound (Eriksson & Lindström, 2006; Larsson & Kallenberg, 1999; Schnyder, Büchi, Sensky, & Klaghofer, 2000).
- As mentioned earlier, there is still no clarity on the stability of SOC over time, as studies vary in their findings.
- More research suggests further criticism of SOC in that the scales used to measure SOC are moderately to weakly related to physical health (Flensborg-Madsen, Ventegodt, & Merrick, 2005). This is based on these authors' review of 50 studies which suggests that SOC is therefore unable to measure health that is determined only through physical means (Flensborg-Madsen et al., 2005).
- Finally, a large area of critique to SOC is based on the hypothesis which asserts that SOC is not concerned about the emotional factors related to the life experiences (Flensborg-Madsen, Ventegodt, & Merrick, 2006c). Furthermore, Flensborg-Madsen, Ventegodt and Merrick, (2006a, 2006b) suggest that SOC should instead of perceiving predictability of events as healthy, consider the possibility that unpredictability of events can add meaning to life.

Hence, one can conclude that the construct of SOC is not without flaws and that many articles in the literature do not fully agree with what Antonovsky initially thought to be a comprehensive construct. Therefore, it is not only good empiricism to consider empirical results for and against the use of a construct when conducting research, but also to include evidence from the literature regarding how it is presented within the specific population group used in the study. Therefore, kindly take note of how SOC is portrayed within the South African context in the following and concluding paragraphs.

2.3.8 SOC in the South African Context

Despite many studies conducted on SOC among South African population groups (Strümpfer, 2013; Wissing, et al., 2013), these studies did not focus their attention on aspects such as physical activity and self-esteem and the possible effects thereof on SOC. While studies conducted on the constructs used in this particular study yielded valuable results, these results were conducted on participants who are primarily from First/Second World countries such as Norway and Japan or other European countries such as Hungary (Endo et al., 2012; Lerdal et al., 2011; Sipos et al., 2015). Hence, one immediately needs to take into account that these studies were conducted from a Western perspective that neglected multiple contextual factors and assumed an individualistic cultural orientation as opposed to a multicultural/collectivistic orientation to life (Wissing, 2013).

A review of studies conducted in SA with regard to SOC suggests that the foci of these studies revolved around a multitude of factors concerning the South African population (Wissing, 2013). More specifically, these studies include research based on well-being rather than SOC alone, and considered areas such as academic achievement, work-related aspects,

diseases, clinical diagnoses and so on (Wissing, 2013). Strümpfer (2013) offers the following view in which he states that: fortigenesis is an expansion of salutogenesis, but that fortigenesis is supported by resiling, which is described as being the verb of resilience and is therefore seen as an active process. He suggests that resiling may be reinforced by a wide variety of characteristics and behaviours, of which SOC and self-esteem forms part of, in addition to other health promoting behaviours, such as physical activity for example. Strümpfer (2013) further acknowledges the role that culture, gender and other psychosocial factors might play with regard to research in this field. In one study which was found to be most narrowly associated with this current study, Malebo, van Eeden and Wissing (2007) found that active sport participation among young black South African adults was positively related to increased levels of SOC. However, in a later book published by Wissing (2013), she suggests various avenues for future research with regard to well-being and SOC. Some of these suggestions include: that empirical research be conducted that can assist with the process of disentangling universal and contextual aspects of well-being; and scientifically exploring different methods through which well-being can be enhanced among people. Another study conducted by Theron and Theron (2010) suggests that although international research has begun to match the antecedents of resilience to specific contexts and/or cultures, SA has failed to deliver the same results.

Hence, a need can be identified for research to be conducted which can facilitate the larger process of developing an improved understanding of constructs such as SOC, the role it plays, and other factors that have a potential influence on it. Despite criticisms against SOC, research suggests that it can contribute significantly in positively coping with stressors as well as overall health (Huber et al., 2011) which offers enough reason to study this construct among the South African population. Thus, the reason for this study in particular.

2.3.9 Conclusion

In this section various research studies and the seminal works of Antonovsky were drawn upon to effectively and adequately describe the construct of SOC and how it relates to this particular study. A brief overview of the historical background was given together with an explanation regarding how the construct and its components were developed. Furthermore, SOC and its stability over time was discussed and hypotheses were reflected upon from the perspectives of perceiving SOC as a personality trait, as well as considering the influences of normal developmental theories. In conclusion, evidence from the literature was presented in which the construct of SOC was criticised. This was followed by a brief review of research conducted within the South African context. The following and final section of chapter two provides an integration of all three constructs used in the present study by drawing together the correlations and possible roles that each of these constructs exert on one another.

2.4 Integration

2.4.1 Introduction

This section aims to provide and clarify aspects from an integrative approach regarding the constructs used in this study, namely: physical activity, self-esteem and SOC. Physical activity can be defined in short as any bodily movement produced by muscles in the body that effectively results in energy expenditure (Caspersen et al., 1985). Physical activity has been explained in a sense whereby it can be sub categorised into different types of physical activity, of which this study sets out to measure general levels thereof (Caspersen et al., 1985; Copeland et al., 2005). Self-esteem has been described as the sum of an individual's thoughts and feelings with regard to him/herself as object (Rosenberg, 1979). As discussed in afore-mentioned paragraphs, this construct too can be subdivided into different categories (Rosenberg, 1979). For the purpose of

this study, global self-esteem as a whole will be under investigation, implying that most subcategories of self-esteem will be included. The third and final construct investigated in the present study puts the construct of SOC under analysis. SOC can be summarised as a coping capacity that people possess which assists them in dealing effectively with daily stressors and furthermore, sometimes more specific or even adverse life events (Antonovsky, 1979, 1987; Super, Wagemakers, Picavet, Verkooijen, & Koelen 2016). SOC is suggested to comprise of three main components namely: comprehensibility, manageability and meaningfulness. Although this construct is believed to initially fluctuate across the life-span, it is depicted to stabilize at approximately age 30 (Antonovsky, 1987). This subsection seeks to explain the correlations, interactions and influences or lack thereof among these constructs, while keeping the student population used in this study in mind.

It is presumed from reading the above-mentioned paragraphs, that individually these variables have been studied to some extent. However, these variables have not been specifically discussed in context with one another. Subsequent paragraphs therefore firstly, evaluate the relationship between physical activity and self-esteem among students to determine whether evidence in the literature depicts this as being a significant and noteworthy correlation. Secondly, the role of SOC on this relationship is investigated by reflecting on previous research studies conducted in the field. In addition, interactions among these constructs are analysed through careful examination of the literature. Finally, this section concludes by providing a holistic view of the influences and relationships found among the constructs under investigation in the present study.

2.4.2 The Relationship Between Physical Activity and Self-Esteem

Physical activity and self-esteem are suggested to be categorised within different domains of functioning, the one being physical and the other being psychological (Caspersen et al., 1985;

Rosenberg, 1965, 1979). However, humans are complex beings and function in environments where different domains of functioning (biological, psychological, social, spiritual, etc.) can be best described as being interrelated (Sigelman & Rider, 2018; Suddendorf, 2018).

Literature suggests that a significant correlation exists between physical activity and self-esteem not only within the university student population/emerging adulthood age group, but also in other age groups ranging from childhood to the elderly (Ahmed, Ho, Zazed, van Niekerk, & Jong-young Lee, 2016; Cekin, 2015; García González & Froment, 2018; Lages et al., 2015; Moral-García et al., 2018). In one study it was found that people with increased levels of physical activity, suggesting regular engagement in physical activities, display higher levels of self-esteem as opposed to those who do not engage in regular physical activity (Lages et al., 2015). Hence, a strong evidence base supports the hypothesis that a significant relationship exists between these two constructs. It is therefore hypothesised that a significant relationship between physical activity and self-esteem may also exist for the population group examined in this study.

Reflecting further on possible gender differences within the population under investigation in this study, the literature depicts gender as being a significant contributing factor that plays a role in the relationship between physical activity and self-esteem among various population groups (Brunnquell et al., 2016; Casper et al., 2013; Collison et al., 2016; Farren et al., 2017; Haq, 2016; Salvatore & Marecek, 2010; Zuckerman et al., 2016). In addition, male students have been found to be more inclined to engage in physical activities as opposed to female students (Swanepoel et al., 2015). Further investigation found that female university students tend to use subjective parameters (such as body-image) as opposed to using objective parameters (such as body mass index) to evaluate their self-esteem (Pop, 2016). Based on these results, the argument is put forward that gender affects both of the above-mentioned constructs in various ways and

definitely needs to be explored in greater detail. Furthermore, it is suggested that separate analyses for male and female students need to be conducted if significant differences are found in the results of this study, as it is hypothesised that it would affect the kurtosis of the results obtained.

2.4.3 Physical Activity, Self-Esteem and SOC

In a systematic review of studies, Poitras and his colleagues (2016) found that any level of physical activity ranging from light intensity to vigorous exercise within the population stretching from childhood into young adulthood, displayed potential benefits for both health promotion as well as disease prevention. Thus, it is hypothesised that SOC and physical activity may influence one another to the extent whereby it may be of clinical relevance. Although gender differences have already been noted when considering the variables used in the present study, other variables (such as age, for example) are hypothesised to account for further differences within different populations.

Analysing all three constructs simultaneously, one notes similarities among them as individual studies have found that positive levels of each of these constructs act as protective factors against disease, or promote individuals' health status in general (Aboalshamat et al., 2017; Brannon et al., 2014; Dhabhar, 2014; Füzéki et al., 2017; Marteinsdottir, Ernerudh, Jonasson, Kristenson, & Garvin, 2016; Sakellari et al., 2018; Sharma et al., 2015; Skodova & Lajciakova, 2013; Sowislo & Orth, 2013; Yiğiter & Hardee, 2017). Although physical activity has been commonly found for decades to significantly affect individuals' position on the health ease/disease continuum, more recently psychological factors such as SOC and self-esteem and their relation to this continuum have also come under investigation (Apers, et al., 2015;

Marteinsdottir et al., 2016; Stock, 2017). In one study Marteinsdottir et al. (2016) found that higher levels of self-esteem correlated with a decreased risk to develop coronary heart disease. As mentioned before, recent studies as well as Antonovsky's (1987) works pose the hypothesis that stronger levels of SOC correlate significantly with improved health and well-being (Apers et al., 2015; Stock, 2017). One can thus hypothesise that evidence in the literature suggests that psychological factors such as SOC and self-esteem, and not just physical factors such as physical activity, also play a significant role in people's position on the health ease/disease continuum (Antonovsky, 1987; Apers et al., 2015; Marteinsdottir et al., 2016; Stock, 2017). Hence, it seems as if more research is needed to establish the relationship/influence of these variables on one another. Moreover, it is suggested that although SOC has been studied widely across multiple contexts, little evidence exists for its role within university students, specifically with regard to physical activity and/or self-esteem.

According to Binkowska-Bury and Januszewicz (2010), SOC is positively related with health-related behaviours, one of which includes physical activity. In a recent study it was found that health promotion activities (such as physical activity) can assist both people and communities in acquiring specific resistance resources (SRR's) which can help them in dealing with specific stressors in specific situations more effectively (Super et al., 2016). This adds to the discussion on GRR's as presented earlier. Not only is the successful application of resources to deal with stressors suggested to have a positive effect on health, but it also creates stable and meaningful life experiences that can positively strengthen SOC levels (Super et al., 2016). Hence, the bidirectional nature of physical activity and SOC and their independent, yet interrelatedness are demonstrated. A review of the work of Eriksson and Lindström (2006), two prominent researchers in the field of SOC, suggests that it has been frequently found that individuals with a high level of SOC tend to be healthier than those with a low levels of SOC. Furthermore, when

reflecting on SOC and self-esteem, it has been found that SOC fully mediates the construct of self-esteem (Wiesmann & Hannich, 2010). However, it should be noted that these findings were obtained in a population much older than the one under investigation in the present study (Wiesmann & Hannich, 2010).

A recent study considers feelings of meaningfulness (which forms part of one of the SOC components) to be a basic driving force in human beings and acts as a contributing factor towards how people perceive their health (Landstad & Åhrberg, 2018). Physical activity among adolescents in the form of sport has been found to have a strong positive relationship with the constructs of SOC and self-esteem (Sipos et al., 2015). Once more, the meaningfulness component of SOC was found to be the most significantly correlated dimension in these relationships (Sipos et al., 2015). Hence, it can be denoted from this statement that the meaningfulness component of SOC inevitably plays a role not only with regard to one's self-esteem but also to one's level of physical activity. High meaningfulness scores on the SOC scale have further been found to be a significant predicting factor in predicting an increase in physical activity among physically inactive and obese individuals (Mutikainen et al., 2015). Considering health as a whole, Packard et al. (2012) found that people who had a poor health status subsequently displayed lower levels of SOC and self-esteem, and they engaged less in physical activity. In another study Ley and Rato Barrio (2013) found that various forms of physical activity led to greater levels of SOC and self-esteem in women who experienced violence. It can be drawn from these studies that SOC might therefore have moderating/mediating effects on the relationship between physical activity and self-esteem as both constructs seem to be influenced by SOC (Landstad & Åhrberg, 2018; Packard et al., 2012; Sipos et al., 2015; Mutikainen et al., 2015). According to Wiesmann and Hannich (2010) it is suggested that physical activity and self-esteem, among others, have been identified as being GRR's. These researchers further

report that based on their findings, SOC fully mediates self-esteem, while SOC was only found to be a partial mediator for physical activity (Wiesmann & Hannich, 2010). In a study that compared the SOC levels of both male and female university athletes versus non-athletes, with an emphasis on GRR's and the three SOC components, results suggested that athletes displayed significantly higher SOC levels as opposed to non-athletes (Endo et al., 2012). Several gender differences were also observed in this study (Endo et al., 2012). Hence, a strong evidence base exists suggesting that the constructs of physical activity, self-esteem and SOC are in fact interrelated, although large differences on account of gender need to be taken into account.

2.4.4 Conclusion

One can deduce from the above paragraphs that interesting discoveries have been made among a vast range of population groups when investigating the constructs of physical activity, self-esteem and SOC. Multiple researchers have found numerous results suggesting that these constructs are related to some extent. Despite the already existing literature in the field, one can still suggest that results obtained in the present study could add valuable information to the evidence base regarding these three constructs. How the present study will investigate these constructs among the university student population will thus decide the type of information added to the literature. The following chapter therefore provides an in-depth discussion regarding methodology used to conduct the present study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the focus is on methodology used in order to conduct this study. The chapter provides an in-depth discussion of the research aim and questions, research design and approach, and participants and sampling techniques used. In addition, this chapter also offers an overview of the procedures of data collection, data analysis and ethical considerations taken into account regarding this study.

3.2 Research Aim and Questions

The aim of this study was to investigate whether SOC has a moderating and/or mediating effect on the relationship between level of physical activity and self-esteem in students registered at the University of the Free State (UFS).

The following research questions were investigated:

1. Is there a significant relationship between self-esteem and physical activity in students?
2. Does SOC moderate/mediate the relationship between the levels of physical activity and self-esteem among students?

The following paragraph discusses the research design and approach followed for this study.

3.3 Research Design and Approach

This study was quantitative in nature and conducted according to a non-experimental, correlational research design (Neuman, 2014; Stangor, 2014).

Quantitative methods can be described as research techniques in which numerical data is gathered objectively and systematically from a specific population group (Fouché & Delport, 2011). This type of data includes data that can be sorted, classified and measured and is usually obtained in survey format (Macdonald & Headlam, 2008). Quantitative data aims to generalise results obtained from a sample to the population by answering questions such as how long, how often, or to which degree some variable occurs (Macdonald & Headlam, 2008). In quantitative methods, the researcher uses standardised or established measures, or assessments to quantify research participants' behaviours, thoughts and emotions in order to conduct statistical analysis (Christenson & Gutierrez, 2016).

Quantitative designs offer researchers the opportunity to test conceptual models and understand the relationships between variables, as is the case with this particular study (Christenson & Gutierrez, 2016). Furthermore, quantitative research designs can be used to authenticate the value of a particular treatment, or to measure the opinions, attitudes or views of a particular group (Christenson & Gutierrez, 2016). In this study a quantitative method was used to determine whether a relationship exists between the variables of levels of physical activity and self-esteem, and to further ascertain whether or not SOC exerts a mediating or moderating effect on this relationship.

One of the advantages of using a quantitative approach is that this method allows for greater objectivity in results and in turn, offers the opportunity for more accurate replication and comparison studies (Kawulich, Garner, & Wagner, 2012). However, using a quantitative method is not without disadvantages. Some disadvantages of using a quantitative approach include the lack of rich, subjective data (related to the participants during data collection), as well as a lack of contextual data, which might lead to a less detailed understanding of human behaviour (Tewksbury, 2009).

The following paragraphs offer a brief discussion of the participants recruited for this study and the sampling techniques employed.

3.4 Research Participants and Sampling Procedures

The research sample comprised of 196 students between the ages of 18-25 currently studying at the UFS. All of the participants included in the present study resided in residences from the UFS.

A non-probability, convenience sampling method was used to identify and recruit participants (Stangor, 2014). Males and females from all ethnic groups who were willing to participate were included in the study. Individuals outside of the above-mentioned age range and students not registered at the UFS were excluded. Participants were recruited on a voluntary basis from two male and two female residences on campus by going to house meetings and introducing the study to them verbally.

The reason for including students from such a large group was made based on the fact that South Africa is a multicultural population. Although the sample used in this study is not representative of the population, efforts were made to make it as close to a representative sample as possible, despite using a non-probability sampling technique. The following paragraphs offer an explanation of the procedures followed in order to collect the data needed for this study.

3.5 Procedures of Data Collection

Data collection took place during the months of March and April in 2018. Data was collected from four residences on campus of which two were female residences and two were male residences. After ethical clearance was obtained from the relevant authorities (reference number:

UFS-HSD2017/1046), residence heads were contacted either telephonically, via email or in person, to schedule dates for data collection sessions to be held. Data collection was then conducted during the times when each residence conducted their house meeting, an event that all residents need to attend weekly, together with the residence council and the residence head.

The data collected for this study consisted of self-report questionnaires that each participant had to complete. All participants had to complete an identical battery of questionnaires. Each battery comprised of three questionnaires which each measured physical activity, self-esteem and SOC respectively. A biographical section encapsulated within the Physical Activity Questionnaire for Adults which included questions relating to age, gender (biological gender, including male and female) and ethnic group was further used to obtain biographical data of each participant. In addition, an information document explaining all relevant information pertaining to the study that the participants could keep, as well as an informed consent document that each participant had to sign prior to their involvement in the study, formed part of the data collection procedures.

At each data collection session, the sequence of events followed an organised pattern which will be explained next. First, the researcher verbally explained the aim and rationale of the study to all students attending each meeting. Secondly, the researcher asked for willing individuals to step forward or raise their hands. Thirdly, the researcher then distributed the questionnaires and informed consent documents to all willing participants. Each participant could choose to withdraw from the study at any stage as they first had to complete the informed consent document which summarised details regarding the study before commencing with the questionnaires. Both the study leader and the researcher's contact details were included in the information document should any participant decide to withdraw from the study after the data collection session had ended. As English is a recognised language of instruction at the UFS,

each participant completed the informed consent document and the battery of questionnaires in English. The researcher was available for questions and concerns that arose during the completion of the test battery as he remained at the venue while participants completed the battery of questionnaires. All students who chose not to participate in the study were asked to allow each participant of the study to complete the complete battery. This took approximately 10-15 minutes to complete. Completed data sets were collected with the help of members from the residence council after participants completed the test batteries. The different measuring instruments used will be discussed in further detail in the next section.

3.6 Measuring Instruments

3.6.1 Physical Activity Questionnaire for Adults (PAQ-AD)

The Physical Activity Questionnaire for Adults (PAQ-AD) was used to measure the level of physical activity among students (Copeland et al., 2005). The scale consists of 7-items which measures general levels of physical activity in the past 7-days. Each item on the scale is scored on a 5-point Likert-type scale with scores ranging from 1 "*No activity*" to 5 "*7 times or more*" for each item. Scores are summed for these seven items. A high score is indicative of a higher level of physical activity (Copeland et al., 2005). No Cronbach alphas were available for the PAQ-AD prior to this study, but good convergent validity was found as this scale showed a significant relationship with similar self-report tools: r = .53 to .64 (Copeland et al., 2005). Cronbach alphas were investigated in this study when statistical analysis was conducted and these results can be found in the results chapter.

3.6.2 Rosenberg Self-Esteem Scale (RSE)

To measure self-esteem among university students, Rosenberg's (1965) Self-Esteem Scale (RSE) was used. The RSE is a 10-item scale which measures global self-worth by examining both positive and negative feelings about the self. The scale is believed to be one-dimensional. All items are answered using a 4-point Likert-type scale format ranging from "*Strongly Agree*" (4), "*Agree*" (3), "*Disagree*" (2), to "*Strongly Disagree*" (1). Items 2, 5, 6, 8, 9 are reverse-scored, meaning that a response of "*Strongly Disagree*" receives 1 point, "*Disagree*" 2 points, "*Agree*" 3 points, and "*Strongly Agree*" 4 points. Examples of questions included in this self-report questionnaire include: "On the whole, I am satisfied with myself"; "*I certainly feel useless at times*"; and "*I take a positive attitude toward myself*". Scores are summed for all ten items. Higher scores indicate higher self-esteem (Rosenberg, 1965). Cronbach alpha's ranging between .88 - .90 were found across six assessments in a study conducted on undergraduate students who attended the University of California at Berkley (Robins, Hendin, & Trzesniewski, 2001). In another study a Cronbach coefficient of .91 was obtained of which the sample represented 48 states in America (Sinclair et al., 2010). In addition to these studies, good psychometric properties were also found in one study conducted in South Africa on five different cultural/racial groups indicating sound multi-cultural validity of the scale (Westaway, Jordaan, & Tsai, 2015).

3.6.3 Orientation to Life Scale (SOC-29)

The concept of SOC was measured using the Orientation to Life Scale (29 items, SOC-29) developed by Antonovsky (1987). Each item is answered by selecting a value between 1 (*never*)

and 7 (*very often*), that best represents the respondent's understanding of the statement. Examples of statements included in this self-report questionnaire are: "*When you talk to people, do you have the feeling that they understand you*?"; "*Life is*:" and "*How often do you have feelings that you're not sure you can keep under control?*". Scores can vary between 29–203 points; the higher the score, the higher the SOC. The one-dimensional scale measures three components namely: comprehensibility, manageability and meaningfulness to obtain a total SOC score (and not three distinct scores for each component). Internal consistency for the SOC-29 was measured using Cronbach's alpha, which ranged from .82 - .95 in 26 studies (Antonovsky, 1993). Another study conducted in Norway, obtained a Cronbach alpha of .92 (Söderhamn et al., 2015). Antonovsky (1987) claimed that the SOC instrument also takes cultural differences into consideration which makes it a valid instrument to use on a population in the South African context.

3.7 Data Analysis

Cronbach's alpha coefficients were calculated to establish the reliability of the different measuring instruments (Stangor, 2014). Descriptive statistics were calculated and analysed using the Statistical Package for the Social Sciences (SPSS – V25) (IBM Corporation, 2017). To investigate the first research question, a Pearson product-moment correlation coefficient (r) was used to measure the strength and direction of the relationship between level of physical activity and self-esteem (Howell, 2017). The second research question was investigated by means of conducting a moderated hierarchical regression analysis (Howell, 2017). This facilitated the process of determining whether or not SOC exerts a moderating and/ or mediating role on the relationship between level of physical activity and self-esteem.

Raw scores were used to conduct statistical analysis. Some of the items included in the instruments used, were negatively formulated. Hence, scores obtained on these items were reversed-scored before total scores were calculated.

3.8 Ethical Considerations

Informed consent was obtained prior to participation and voluntary participation was emphasised throughout the entire study. Attention to confidentiality and anonymity of the data was given throughout the research process. No potential harm was anticipated and no deception or coercion was used with regard to participation in this study, thus adhering to the non-maleficence principle (Allan, 2016). All participants were treated in the same manner to ensure uniformity. As students of the UFS were used in this research study, students who developed any need for psychological assistance had the opportunity to be referred to Student Counselling and Development for psychotherapeutic sessions. Such sessions were arranged with this institution prior to conducting the present study. As another precautionary measure, ethical clearance (reference number: UFS-HSD2017/1046) had to be, and was obtained through the Ethics Committee of the Faculty of Humanities at the UFS. Approval from the Dean of Student Affairs, the Vice-Rector of Research at the UFS, as well as the Head of the Psychology Department to gather data from the above-mentioned participants was also obtained.

3.9 Chapter Summary

This chapter explained the aim and research questions to be investigated and elaborates on the research design and approach followed in the present study. The researcher then described the processes of participant selection and sampling as well as how data collection took place. Each measuring instrument used to measure the variables under investigation was considered next.

Details regarding data analysis procedures were further discussed. In conclusion, ethical considerations relevant to the study were included in the discussion. The following chapter provides specifics regarding results obtained in the present study and furthermore offers a discussion surrounding these results in the context of existing literature.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

To date, few studies have focused their attention on trying to explain the role of SOC on the relationship between physical activity and self-esteem, especially in students. Firstly, the aim of this study is to investigate to which extent physical activity correlates with students' self-esteem. Secondly, if a significant relationship is found to be evident among these variables, both the mediating or moderating role that SOC might play within this relationship will be further explored. Thirdly, if however, no statistically significant relationship is found (on at least a 5% - level of significance), only a moderator effect will be investigated. According to Baron and Kenny (1986), a mediator effect can only be investigated once a significant relationship has been established to be present among all three of the variables (independent, dependent and intervening).

In this study students' self-esteem is the criterion variable (dependent variable) while physical activity is the predictor variable (independent variable). SOC is the intervening variable used and its possible role (as mediator or moderator) in the relationship between the independent and dependent variables will thus be explored.

4.2 Sample

A non-probability, convenience type sampling method was used to recruit participants (Stangor, 2014). Residences were selected based on their approachability after contacting the governing staff/students at each residence. Residences who were most willing to cooperate and participate in the study were selected. Residence heads were contacted telephonically, via email and in person in order to establish their willingness to take part in this research study and to

further schedule appropriate times for data collection to take place. Males and females aged 18-25 from all ethnic groups willing to participate in the present study were included. Individuals outside of the above-mentioned age range, students not registered at the UFS or who live in private accommodation and not in campus residences were excluded from the study. Participants were recruited voluntarily from both male and female residences at campus through attendance of house meetings at the various participating residences. The aim of the study and main characteristics were introduced to audiences and the expectations of each participant was described verbally. Prospective participants further received a written information document that explained the study and their participation in it as well as an informed consent document which had to be signed prior to participation.

Initially, data were collected for 200 students from the four residences, however, four questionnaires were found to be incomplete and were therefore not used in this study. The final sample thus comprised of 196 respondents of which 106 (54.1%) were female and 90 (45.9%) were male students. The mean age for the total sample is 19.83 years with a standard deviation of 1.56 years. The minimum and maximum ages are 18 and 25 respectively. For female students, the average age is 19.92 years (SD = 1.566) whilst the average age for male students is 19.72 (SD = 1.565). The differences between these two averages was found not to be statistically significant (t_{194} = .902; p = .368). The sample group is represented in terms of ethnicity and gender in Table 1.

Table 1

Frequency distribution for the sample according to gender and ethnicity

Ethnicity	**Female**		**Male**		**Total**	**%**
	N	**%**	**N**	**%**	**N**	**%**
Black	56	52.8	10	11.1	66	33.7
Coloured	22	2.8	1	1.1	23	11.7
White	24	22.6	78	86.7	102	52.0
Other	4	3.8	1	1.1	5	2.6
Total	**106**	**54.1**	**90**	**45.9**	**196**	**10.0**

According to Table 1, the majority of respondents are White (52%), while approximately one third (33.7%) are Black and 11.7% are Coloured. Five respondents marked "other" as their ethnicity. What should be duly noted is the fact that the majority of male respondents (86.7%) are White, while only 22.6% of females are White. Considering the female students, the group primarily consists of black and coloured (73.6%) females. This thus necessitates further investigation due to the large differences in the proportional ethnic composition of the sample group. Chi-square test was calculated to determine whether or not a statistically significant relationship exists between gender and ethnicity. The result ($\chi^2 = 79.305$; df = 2; p = .000) suggests that a significant relationship exists. Accordingly, it was decided that the research hypothesis should rather be examined separately for the two gender groups

Next, the measuring instruments that were used to measure the above-mentioned variables will be discussed.

4.3 Measuring Instruments

The reliability for all three individual scales used in this study were investigated respectively. For this purpose, internal consistency for each scale was investigated using Cronbach's alpha coefficient with the help of SPSS computer program (SPSS Incorporated, 2017). The results of these calculations can be found in Table 2.

Table 2

Cronbach's α coefficients for the scales of the measuring instruments

Scales	**α-coefficient**
Physical Activity	.829
Self-Esteem	.804
Sense of Coherence	.855

The calculated coefficients shown in Table 2 indicate that all of the subscales display good internal consistency. According to Foster and Parker (1999) the above-mentioned reliability coefficients are acceptable as the scales are not cognitive in nature. These authors suggest that reliability coefficients of less than .8 can be expected for non-cognitive tests as they measure broader constructs (Foster & Parker, 1999). According to Lance, Butts and Michels (2006), a Cronbach alpha coefficient of .7 is generally acceptable in social science research. In this case, all three scales delivered a reliability coefficient higher than .8.

4.4 Research Hypothesis

Based on the objective of the study and in keeping with the preceding literature, the following research hypothesis was formulated: *SOC does play a role in the relationship between physical activity and self-esteem among students – either as a mediator or moderator.*

To investigate this hypothesis a specific statistical procedure was followed which is discussed next.

4.5 Statistical Procedure

The 25th edition of the Statistical Package for the Social Sciences (SPSS) program was used to analyse the data (SPSS, Incorporated, 2017). To investigate the formulated hypothesis, moderated multiple regression analyses were performed. With this procedure, regression analysis is conducted in three steps. In the first step, analysis of single variables is dealt with: physical activity (independent variable) is added first to the regression equation (with self-esteem as dependent variable) to establish the relationship between these two variables. Hereafter, SOC (intervening variable) is added, while the independent variable (physical activity) remains part of

the equation. Using this method, each of the predictor variables' proportionally significant contribution towards prediction of the criterion variable (self-esteem) is determined. In the third step the *product* between the independent variables, namely, physical activity and SOC are further added to the other two variables within the regression equation. To prevent multicollinearity (Howell, 2017) deviation scores of the variables involved were first calculated and thereafter the product of the two sets of deviation scores were calculated. The analysis procedure followed is discussed in greater detail below.

Step one determines whether or not a direct relationship exists between the independent variable (physical activity) and students' level of self-esteem, and whether or not this is deemed to be significant. If subsequent variables are added to the equation, the following can be assumed:

- If the calculated *Beta*-coefficient of physical activity is found to be significant in step one, but not significant in step two (when SOC is added to the equation), it can be assumed that SOC is a mediator variable. (A mediator variable serves as an intervening variable to the degree to which it can help to explain the relationship between the predictor variable and the criterion variable) (Baron & Kenny, 1986).
- If the *Beta*-coefficient of the product term (step 3) is significant, it can be assumed that a significant interaction exists, therefore, indicating a moderator effect to be present. (A moderator variable influences the direction and/or strength of the relationship between the predictor variable and criterion variables) (Baron & Kenny, 1986).

Both the 1% and 5% levels of significance were used in the analyses.

4.6 Results

Before analysis of the research question is discussed, the correlations between the dependent, independent and intervening variables for the total group, as well as for the two genders are calculated and provided/displayed in Table 3.

Table 3

Inter-correlations for both genders individually as well as for the total group (N = 196)

Variable	**Female (n=106)**		**Male (n=90)**		**Total**	
	PA	**SOC**	**PA**	**SOC**	**PA**	**SOC**
Self-Esteem (SE)	.151	.542**	.219**	.724**	.193**	.627**
Physical Activity (PA)	-	.275**	-	.248**	-	.269**
Sense of Coherence (SOC)		-		-		-

** p <= .01

* p <= .05

Concerning a relationship between physical activity and self-esteem for the total group, a significant positive relationship (.193) was found on the 1% level of significance. This coefficient has a small effect size which suggests that this result is not of practical relevance for the total group. However, when investigating the two genders, no significant relationship was found for female students, whilst for the male students, a significant positive relationship (.219) was found which suggests a small to medium effect size. Due to this statistically non-significant relationship between physical activity and self-esteem for females, it was decided that only a moderator effect (and not a mediator effect) will be investigated for female students. For the males however, both mediator and moderator effects will be investigated. Results found in Table 3 furthermore suggest that significant positive relationships exist between self-esteem and SOC for all three groups (total, female and male). All three of these coefficients indicate large effect sizes and the result is therefore of high practical interest. Furthermore, a medium effect size was found for the relationship between physical activity and SOC for all three groups and is thus of

practical relevance. All afore-mentioned coefficients are positive which suggest that an increase in any of the variables' scores, would bring about an increase in the other variables' scores as well.

Next, the possible role of SOC in the relationship between physical activity and self-esteem in students was investigated. As discussed previously, separate moderated multiple regression analyses were conducted for the different genders. Results are firstly presented for the females and for the males thereafter.

4.6.1 Results for Female Students

Results of the moderated multiple regression analysis with physical activity as independent variable, self-esteem as dependent variable and SOC as intervening variable are displayed in Table 4 for the females.

Table 4

Moderated multiple regression analysis with physical activity as independent variable, self-esteem as dependent variable and sense of coherence as intervening variable for female students.

Model	Unstandardised Coefficients		Standardised Coefficients	*t*	*p*	*F*	*R*	R^2	Adjusted R^2
	B	Std. Error	*β*						
1. (Constant)	27.799	1.300		21.387	.000	2.402	.151	.023	.013
Physical	.136	.088	.151	1.550	.124				
2. (Constant)	14.751	2.328		6.338	.000	21.944	.548	.301	.287
Physical	.000	.078	.000	.004	.997				
Sense C	.119	.019	.548	6.369	.000				
3. (Constant)	14.973	2.394		6.253	.000	14.572	.550	.302	.281
Physical	.009	.081	.010	.111	.912				
Sense C	.117	.020	.537	5.959	.000				
PhysxSense	-.002	.004	-.037	-.425	.672				

As indicated earlier, only the moderator effect of SOC was investigated in the relationship between physical activity and self-esteem of female students. According to the results found in Table 4 (β = -.037; t = -.425; p =.672) no significant moderator was identified for this group. For

the female group then, results indicate that SOC could not be identified as a moderator variable in the relationship between their physical activity and self-esteem.

In keeping with this, the possible role of SOC in the relationship between physical activity and self-esteem for male students is investigated next.

4.6.2 Results for Male Students

Results of the moderated multiple regression analysis with physical activity as independent variable, self-esteem as dependent variable and SOC as intervening variable are displayed in Table 5 for the male students.

Table 5

Moderated multiple regression analysis with physical activity as independent variable, self-esteem as dependent variable and sense of coherence as intervening variable for male students.

Model	Unstandardised Coefficients		Standardised Coefficients	*t*	*p*	*F*	*R*	R^2	Adjusted R^2
	B	Std. Error	*β*						
1. (Constant)	27.079	1.568		17.268	.000	4.439	.219	.048	.037
Physical	.174	.083	.219	2.107	.038				
2. (Constant)	1.989	2.047		5.369	.000	48.290	.725	.526	.515
Physical	.033	.061	.042	.553	.582				
Sense C	.145	.015	.714	9.368	.000				
3. (Constant)	9.664	2.193		4.406	.000	33.598	.735	.540	.524
Physical	.047	.061	.060	.783	.436				
Sense C	.155	.016	.760	9.385	.000				
PhysxSense	-.005	.003	-.128	-1.588	.116				

From Table 5 it is clear that a significant positive relationship on the 1% level of significance exists between SOC and the level of self-esteem that male students experience. It can thus be assumed that SOC has a direct influence on the self-esteem of male students and that respondents with high levels of SOC are more inclined to experience high levels of self-esteem. Considering SOC, this effectively means that male students' SOC, independent of their physical activity, plays an important role with regard to the level of self-esteem that they experience.

Table 5's results indicate in step 1 that physical activity is significantly related (β = .219; t = 2.107; p =.038) on the 5% level of significance with self-esteem of the male students. During step 2, when SOC is added as a second predictor, it is however noticeable that the direct influence of physical activity is no longer significant (β = .042; t = .553; p =.582). This result indicates that SOC does act as a mediator in the relationship between physical activity and self-esteem for male students. Given this mediator effect, a regression analysis was performed in order to determine and investigate the relationship between physical activity and SOC. The result of the above-mentioned is displayed graphically in Figure 1.

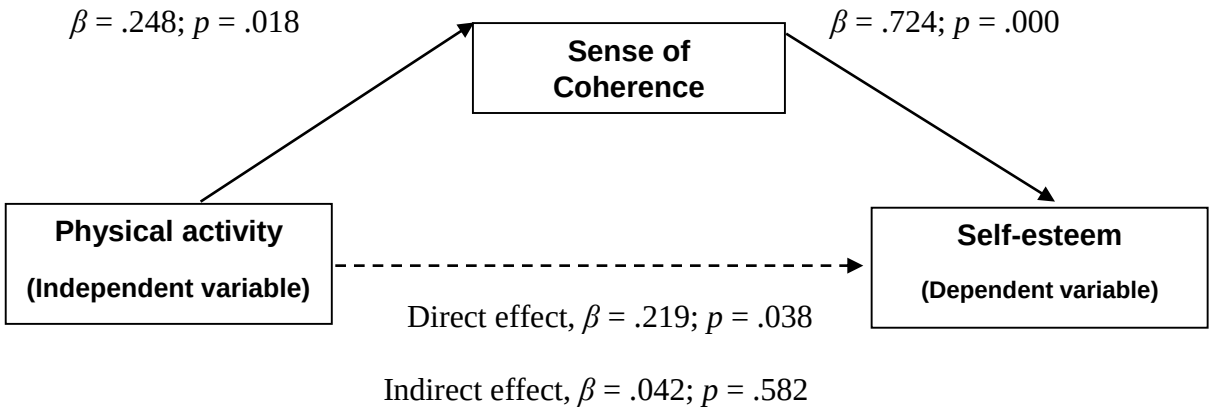

Figure 1: The mediating effect of sense of coherence in the relationship between physical activity and self-esteem for young male adults.

The result thus confirms that for male students (of which the majority were white students), when SOC intervenes, a strong *direct* relationship between physical activity and self-esteem is no longer present. From this result it can be concluded that with an increase in physical activity, male students are more inclined to experience an increase in SOC, which in turn positively influences their self-esteem.

4.7 Discussion of the Results

In this section, results obtained in the present study are discussed and situated within empirical findings of other research studies.

The aim of this study was to investigate the role of SOC on the relationship between physical activity and self-esteem among students from the UFS. Due to conclusive evidence found in the literature suggesting that significant differences concerning gender may play a role when these variables are considered, special attention was given especially in this regard. An international study conducted by Hallal et al., (2012) suggests that approximately one third of the world's population live sedentary lives. From the literature, one can hypothesise that through strengthening one's SOC, physical activity levels may increase (Binkowska-Bury & Januszewicz, 2010; Ley & Rato Barrio, 2013; Sipos et al., 2015). However, physical activity may further have a bidirectional effect whereby it causes an increase in SOC for some individuals as well (Super et al., 2016). Once more, the contribution of this study thus adds to the literature as it further includes a third component of a psychological nature in the form of self-esteem. Students between the ages of 18-25 participated in this study. Arnett (2004) portrays this developmental stage (emerging adulthood) as being a transitional period between adolescence and young adulthood that brings about many changes across all domains of human functioning. It is from this theory that it is hypothesised that many interesting findings could result from research within this population. Therefore, consider a discussion which summarises the main findings obtained in the present study.

Considering the afore-mentioned results, certain aspects need to be stressed. Firstly, gender differences were observed as results revealed a significant positive relationship to be present between physical activity and self-esteem only for male students. Despite many studies

suggesting physical activity and self-esteem to be significantly related within different population groups (Cekin, 2015; García González & Froment, 2018; Lages et al., 2015; Moral-García et al., 2018), it is not a new concept to find gender differences when considering these two variables individually (Collison et al., 2016; Farren et al., 2017; Haq, 2016; Lauderdale et al., 2015; Lerner et al., 2011; Zuckerman et al., 2016). Few studies have conducted in-depth research to explicitly explain why these discrepancies exist. In addition, evidence in the literature suggests that a strong positive relationship exists for the variables of physical activity and self-esteem among the young adult population without referring specifically to gender (Cekin, 2015; Lages et al., 2015). Considering the above-mentioned result, this finding correlates with recent research conducted in the field which suggests that a strong positive correlation between physical activity and self-esteem exists (Cresswell & Travill, 2014; Mavrić, Belić, Fazlagić, & Mavrić, 2015; Swanepoel et al., 2015). In only one of these studies, research was conducted on young adults (Mavrić et al., 2015).

This introduces the next point of discussion, as no significant relationship was found to be present for female students regarding these two variables within the present study. Conflicting results were obtained in another study in which, although these researchers did not investigate a direct/linear relationship, increased levels of physical activity was found to lead to increased levels of global self-esteem in female breast cancer survivors (Awick, Phillips, Lloyd, & McAuley, 2017; Landry, Chasles, Pointreau, Bourgeois, & Boyas, 2018). A possible explanation for this result can be derived from results obtained in another study conducted by Merdinoğlu, Gürsoy, Hazar, and Dalli (2017). According to Merdinoğlu et al. (2017), variables other than physical activity, such as acquiring a positive perception of one's body, is suggested to play a significant role in increasing young adult females' self-esteem. Nonetheless, this finding inevitably guided the structure of analysis and subsequently participants were categorised

based on gender. This procedure was followed in order to obtain statistically sound results for both male and female participants.

Secondly, strong positive correlations were found among self-esteem and SOC for all three groups (males, females, total group) with large effect sizes. These results are concurrent with results obtained in studies conducted on adolescents (Moksnes, & Lazarewicz, 2016; Sipos et al., 2015). Additional research has also found these variables to either increase or decrease in accordance with one another in various contexts although these studies were conducted among populations from different age groups than the one under investigation in the present study (Grodzinsky et al., 2015; Nuccitelli et al., 2018). From a psychological perspective, the clinical relevance of the findings mentioned here can be valuable within the student population. In accordance with the literature, one can further derive that multiple factors, including SOC, can play a role in self-esteem amongst university students (Collison et al., 2016; Haq, 2016; Narae, 2018; Zuckerman et al., 2016). Drawing on these results, it is suggested that developing stronger SOC in a therapeutic setting can facilitate the process of addressing poor levels of self-esteem.

Thirdly, results further yielded a positive relationship with a medium effect size for all three groups between the variables of physical activity and SOC, suggesting an increase in one of these variables would ultimately result in an increase in the other. This finding is in agreement with results obtained in previous studies (Binkowska-Bury & Januszewicz, 2010; Endo et al., 2012). In addition, another study found that high scores on the subcomponent meaningfulness of SOC predicts greater levels of physical activity, which is in alignment with these results (Sipos et al., 2015). Effectively, this finding has multiple implications as it broadens one's awareness to the possibilities captured within this result. Knowing this, one is made aware of the likelihood that the more one engages in physical activity, regardless of gender, the stronger your SOC is suggested to be and vice versa. However, in keeping with the first result stressed above, one is

reminded that no significant relationship between physical activity and self-esteem for female students were found. Hence, the results suggest that physical activity and SOC might in fact have a bidirectional effect on one another - specifically when investigating male students. Results obtained in Super et al. (2016) as well as in the present study supports the retention of this hypothesis in which both male and female participants took part. In the research study conducted by Super et al. (2016), it was found that strong SOC could positively influence participants' motivation to become more physically active, but also that participation in physical activities could lead one to derive a sense of meaning in life which would enhance one's SOC. Adding to this hypothesis, Wiesmann and Hannich (2010) found SOC to be a partial mediator for physical activity which further strengthens the evidence base regarding the directionality of these constructs.

Fourthly, based on the results obtained from the moderated multiple regression analysis for female students, SOC could not be identified as a moderator variable in the relationship between physical activity and self-esteem. As no significant relationship was found between physical activity and self-esteem for females in this study, it bares logic that SOC cannot exert a moderating effect on this relationship. However, keeping in mind that self-esteem and SOC were significantly related for all three groups investigated (males, females and total group), one could hypothesise that SOC may act as a moderating/mediating variable between other variables and self-esteem. Although their study included both male and female participants, Wiesmann and Hannich (2010) suggest that SOC fully mediates the relationship between physical activity and self-esteem. Thus, the present study agrees with these findings when reflecting on males only. Endo et al. (2012) support the finding stating that differences exist among males and females regarding their SOC scores. Their research suggests that males have a higher total SOC and comprehensibility score compared to females who displayed higher values on the

meaningfulness component (Endo et al., 2012). Hence, drawing on these results one can suggest that the function SOC fulfils for both males and females will be different and therefore, variables influencing SOC are also hypothesised to vary, based on gender.

In the fifth place, results suggest that SOC and self-esteem are significantly related and that irrespective of their physical activity, male students who have higher SOC are suggested to display higher levels of self-esteem. When drawing upon the SOC theory, this finding can be explained from the perspective of Antonovsky (1987). According to Antonovsky (1987), stronger SOC is indicative of someone who is better able to effectively deal with and manage stressful situations, observes the world and his/her surroundings as organised, is of opinion that he/she has control over life, and ascribes meaning to different life events. Hence, from this perspective it follows logically that although physical activity may significantly explain some of the variance in SOC when examining male students, even in the absence of physical activity, SOC significantly influences their self-esteem. The same can however not be said for female students. Although Sipos et al. (2015) found that physical activity, self-esteem and SOC are significantly related amongst adolescents, this study offers dissimilar results among university students.

Lastly, a significant relationship was also found to be present in male students between physical activity and self-esteem. SOC was identified as a mediator in the relationship between physical activity and self-esteem for male students. Thus, results for male students effectively suggests that, males who are more physically active are inclined to experience higher levels of SOC which effectively, causes them to experience higher levels of self-esteem. However, female students' SOC have been demonstrated to be influenced by different variables than male students' SOC which needs to be taken into account. Adding to the results obtained by Wiesmann and Hannich's (2010), the present study found SOC to fully mediate the relationship

between physical activity and self-esteem in male students. In another study, similar results were obtained whereby physical activity was found to contribute significantly to male athletes' SOC, but not to female athletes' (Endo et al., 2012).

It can be concluded that variances were obtained with respect to the relationship between physical activity and self-esteem when the effect of gender was investigated. SOC was found to play a significant role for male students in this correlation, although no such effect could be determined for female students. Finally, significant positive correlations were obtained for all three groups (male, female and total) regarding SOC and self-esteem as well as SOC and physical activity. The subsequent chapter identifies some of the limitations found in the present study, while at the same time offering some recommendations for future research studies. This discussion is finally concluded as the value of the present study is discussed.

CHAPTER 5: LIMITATIONS, RECOMMENDATIONS AND VALUE OF THE STUDY

The focus of this chapter is on the limitations of the study, followed by a discussion of the most important recommendations as well as the value of the study.

5.1 Limitations to the Study

Despite obtaining significant results, certain limitations were identified. Hence the findings of this study can be further understood through careful consideration of these limitations.

Reflecting upon the methodology used, one has to take into account that the quantitative nature of this study led to qualitative aspects being neglected. Although this approach has its advantages in providing objective numerical data (Maree, 2016), due to a lack of rich qualitative answers not included in the data collection, in-depth information from individual participants could not be included in this study (Stangor, 2014).

All of the participants included are currently enrolled at the UFS, reside in campus residences, and fall within the emerging adulthood age range (18-25 years old), to name but a few of the similarities. Participants not fulfilling these criteria were excluded from the study. As a result, possible participants living in private accommodation, individuals not enrolled as students at all or students from other universities, cities or provinces were excluded. A limitation worth mentioning is that the probability of the participants' inclusion in this study could not be determined due to the form of the non-probability, convenience type sampling method that the current study took on (Stangor, 2014). Although, this is a cost-effective and time-saving method to use, it does not provide the researcher with representative samples (Demetriou, Ozer, & Essau, 2015). Effectively, this led to results from this study not being generaliseable to the larger, general population of SA. Furthermore, the sample was also not representative of the current

South African population. Instead, the findings of this study only bares relevance for the university students enrolled at the UFS and currently residing in residences. Perceiving this as a limitation, one could argue that the inclusion of participants not meeting the above-mentioned criteria could have offered more interesting findings regarding how the constructs investigated in this study relates to all people aged 18-25 within SA and not merely for residence students from the UFS.

Although statistical analysis determined that significant relationships exists between physical activity and self-esteem for male students and between SOC and self-esteem for all three groups, statistical analysis cannot explain why these relationships exist (Howell, 2017). Thus, the aetiology of these relationships remains open to debate, speculation and further research. Furthermore, self-report instruments were used to obtain data for this study. A shortcoming of using these types of instruments include the greater likelihood of participants answering untruthfully, in socially desirable ways, or by adopting a certain response bias (Demetriou et al., 2015; Foxcroft & Roodt, 2013). This could have had an influence on the internal consistency and validity of the measuring instruments used to conduct this study (Foxcroft & Roodt, 2013). In addition, using self-report scales may not always allow participants the flexibility to provide detailed responses that are in line with their views. Instead, they have a limited ability to express themselves (Demetriou et al., 2015). Participants are furthermore hypothesised to answer questions based on their current mental state which can fluctuate based on environmental stimuli/stressors. The time at which the questionnaires where developed can also be brought under critique, as all three questionnaires date back to more than ten years since their development. Nonetheless, good internal consistency values were obtained for all three measuring instruments used in this study with α coefficients suggesting sound reliability properties of these instruments.

In conclusion, different types of faculties that participants are enrolled in were not taken into consideration, meaning that students studying medicine, education, agriculture, etc. were all included into one group and subdivided based on gender.

5.2 Recommendations for Future Research

Reflecting on the findings of this study, the following recommendations can be made for future research studies. Recommendations can be best described as being twofold. One can firstly consider aspects relating to the theoretical impact of this study, and secondly, the practical impact that these findings may suggest.

Considering theoretical implications of the findings of this study, the following can be said. Firstly, it is suggested that using a different methodological approach may offer additional and perhaps more sophisticated findings. From the use of a mixed method approach, one would be able to gather more in-depth data (Stangor, 2014). In doing so, one could possibly determine or further explain why certain correlations and interactions do not exist within the student population. Furthermore, a better understanding of the constructs of physical activity, self-esteem and SOC from individual experiences of students would be obtained, thus providing the researcher with a clearer understanding regarding the inner workings of these variables within the student population. Secondly, using an experimental, probability type sampling method (such as randomised sampling) and/or assembling a sample that is in line with the current ethnic distribution in SA, would assist with generalising findings. Thirdly, although it is not necessary, following a longitudinal approach could offer interesting findings which could describe how these variables may/ may not vary across different developmental stages. Fourthly, by including the faculties at which students are enrolled in as part of the data collection procedure, one can search for discrepancies among students from different faculties to ascertain how these students

are the same/different from one another by comparing their levels of physical activity, self-esteem and SOC.

Next, when reflecting upon the literature and findings of this study, it is evident that a discrepancy exists between male and female students regarding their levels of physical activity, self-esteem and SOC. Hence, practical implications of the findings of this study further holds relevance and should be examined in greater detail. As was observed in the discussion, SOC is significantly related to self-esteem for all three groups analysed in this study. Effectively, findings from this study hold clinical relevance as it may contribute towards the development of intervention programs with the aim of increasing either SOC or self-esteem in UFS students. It can further be used in order to possibly promote greater levels of physical activity among students in residences as a means of combating against the ever-increasing rate of sedentary behaviour within this population.

In addition, results from this study indicated that a significant positive relationship exists between the constructs of physical activity and SOC for all three groups, suggesting that physical activity can be considered as one possible route to increase SOC in UFS students. However, it needs to be kept in mind that a non-significant relationship was found for female students when investigating the correlation between physical activity and self-esteem. This effectively suggests that programs developed to increase self-esteem in female students should rather not include physical activity as a possible intervention on its own. Finally, further exploration regarding aspects such as different GRR's that students from different backgrounds, different faculties, or students of different genders possess, can ultimately form part of future research endeavours. In addition, one could investigate and analyse SOC with regard to its three subcomponents to ascertain whether gender possibly affects scores obtained in each subcomponent within the university student population.

5.3 Value of the study

This study adds value to the existing literature base as it suggests that SOC acts as a mediating variable on the relationship between physical activity and self-esteem for male students, but that dissimilar results were obtained for female students. It furthermore adds to the knowledge base as key findings of this study can be used practically in the development of programs with the focus of improving university students' self-esteem at the UFS. By adding programs such as these, one also creates the possibility of reducing risky behaviours among university students. Through careful examination in this study, it was found that physical activity influences male and female students differently, and that furthermore, gender differences exist regarding aspects that play a role in self-esteem of male and female students. While physical activity was found to be a significant contributing factor to enhance SOC levels of male UFS students, it can be added that other variables account for similar effects among female students from the UFS. This finding suggests that although males and females have been found to benefit equally physically from engaging in regular physical activity, when considering SOC specifically, it seems as if dissimilar effects exist on a psychological level for male and female UFS students. Nonetheless, the role of SOC was found to be significant in that SOC can be illustrated as a construct that can play a role in multiple important areas of human functioning, including individuals in the emerging adulthood stage.

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Appendices

Appendix A – Physical Activity Questionnaire (Adults)

Physical Activity Questionnaire (Adults)

Name and Surname: _____
Age: _____
Ethnicity: _____
Sex: M_____ F_____

We are trying to find out about your level of physical activity from ***the last 7 days*** (in the last week). This includes activities that make you sweat, make your legs feel tired, or make you breathe hard, such as team sports, running, strenuous occupational activities, and others.

Remember:

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

---

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Rock climbing.....….	❍	❍	❍	❍	❍
Rowing/canoeing	❍	❍	❍	❍	❍
Tennis/squash .....…	❍	❍	❍	❍	❍
Stair climber (or other similar equipment).....	❍	❍	❍	❍	❍
Walking for exercise	❍	❍	❍	❍	❍
Heavy yard work	❍	❍	❍	❍	❍
Jogging or running	❍	❍	❍	❍	❍
Bicycling .....……	❍	❍	❍	❍	❍
Aerobics (or other exercise class)...	❍	❍	❍	❍	❍
Swimming .....…	❍	❍	❍	❍	❍
Baseball, softball .....…	❍	❍	❍	❍	❍
Dance .....…	❍	❍	❍	❍	❍
Rugby	❍	❍	❍	❍	❍
Badminton .....….	❍	❍	❍	❍	❍
Soccer	❍	❍	❍	❍	❍
Hockey.....	❍	❍	❍	❍	❍
Volleyball	❍	❍	❍	❍	❍
Basketball .....….	❍	❍	❍	❍	❍

Martial arts.....……	❍	❍	❍	❍	❍
Weight training.....…….	❍	❍	❍	❍	❍
Other:					
_____..…	❍	❍	❍	❍	❍
_____..…	❍	❍	❍	❍	❍

2. In the last 7 days, *during the morning*, how often were you very active (for example: playing sports, exercise classes, strenuous occupational activity)? (Check one only.)

None ..……..... ❍
1 time last week ..... ❍
2 or 3 times last week ..... ❍
4 or 5 times last week..... ❍
6 or 7 times last week ..... ❍

3. In the last 7 days, *after lunch and before supper*, how often were you very active (for example: playing sports, exercise classes, strenuous occupational activity)? (Check one only.)

None ..... ❍
1 time last week ..... ❍
2 or 3 times last week ..... ❍
4 or 5 times last week..... ❍
6 or 7 times last week..... ❍

4. In the last 7 days, *during the evening*, how often were you very active (for example: playing sports, exercise classes, strenuous occupational activity)? (Check one only.)

None ..... ❍
1 time last week ..... ❍
2 or 3 times last week ..... ❍
4 or 5 last week ..... ❍
6 or 7 times last week ..... ❍

5. *On the last weekend*, how often were you very active (for example: playing sports, exercise classes, strenuous occupational activity)? (Check one only.)

None .....… ❍
1 time ..... ❍
2 — 3 times ..... ❍
4 — 5 times ..... ❍
6 or more times ..... ❍

6. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

A. All or most of my free time was spent doing things that involve little physical effort ..... ❍

B. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) ..... ❍

C. I often (3 — 4 times last week) did physical things in my free time ..... ❍

D. I quite often (5 — 6 times last week) did physical things in my free time …… ❍

E. I very often (7 or more times last week) did physical things in my free time … ❍

7. Mark how often you did physical activity (for example: playing sports, exercise classes, strenuous occupational activity).

	None	Little bit	Medium	Often	Very often
Monday	❍	❍	❍	❍	❍
Tuesday	❍	❍	❍	❍	❍
Wednesday	❍	❍	❍	❍	❍
Thursday	❍	❍	❍	❍	❍
Friday	❍	❍	❍	❍	❍
Saturday	❍	❍	❍	❍	❍
Sunday	❍	❍	❍	❍	❍

8. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

Yes ..... ❍
No ..... ❍

If Yes, what prevented you? _____

Scoring the PAQ-AD

The PAQ-AD (a modified version of the PAQ-C and PAQ-A for Adults) activity summary for adults students consists of **7** items ranging from 1 to 5 (with sub-items on items 1 and 7 also ranging from 1 to 5; item 8 ("Were you sick last week, or did anything prevent you from doing your normal activity") is NOT used in the calculation of the activity summary).

Item 1 - take the mean of all activities (1 being "no" activity, 5 being "7 times or more") on the activity checklist to form a composite for item 1.

Item 2 to 6 (morning, lunch and before supper, evening, weekends, describes you best)
- simply use the reported values that are checked off (1 being low activity and 5 being high activity).

Item 7 - take the mean of all days of the week (1 being "none", 5 being "very often") to form a composite for item 8.

Item 8 - can be used to identify students who had unusual activity during the previous week, but is NOT used as part of the summary activity score.

Once you have a value from 1 to 5 for each of the 7 items (items 1 to 8) used in the physical activity composite score, you simply take the mean of these 8 items, which results in the final PAQ-AD activity summary score.

Appendix B – Rosenberg Self-Esteem Scale

Instructions (Rosenberg Self-Esteem Scale)

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1. On the whole, I am satisfied with myself.

Strongly Agree Agree Disagree Strongly Disagree

2. At times I think I am no good at all.

Strongly Agree Agree Disagree Strongly Disagree

3. I feel that I have a number of good qualities.

Strongly Agree Agree Disagree Strongly Disagree

4. I am able to do things as well as most other people.

Strongly Agree Agree Disagree Strongly Disagree

5. I feel I do not have much to be proud of.

Strongly Agree Agree Disagree Strongly Disagree

6. I certainly feel useless at times.

Strongly Agree Agree Disagree Strongly Disagree

7. I feel that I'm a person of worth, at least on an equal plane with others.

Strongly Agree Agree Disagree Strongly Disagree

8. I wish I could have more respect for myself.

Strongly Agree Agree Disagree Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.

Strongly Agree Agree Disagree Strongly Disagree

1. I take a positive attitude toward myself.

Strongly Agree Agree Disagree Strongly Disagree

Scoring:

Items 2, 5, 6, 8, 9 are reverse scored. Give “Strongly Disagree” 1 point, “Disagree” 2 points, “Agree” 3 points, and “Strongly Agree” 4 points. Sum scores for all ten items. Keep scores on a continuous scale. Higher scores indicate higher self-esteem.

Appendix C – Orientation to Life Questionnaire

Orientation to Life Questionnaire

Here is a series of questions relating to various aspects of our lives. Each question has seven possible answers. Please mark the number which expresses your answer, with numbers 1 and 7 being the extreme answers. If the words under 1 are right for you, mark 1; if the words under 7 are right for you, mark 7. If you feel differently, circle the number which best expresses your feeling. Please give only one answer to each question.

1. When you talk to people, do you have the feeling that they understand you?

1	2	3	4	5	6	7

*_____

never have this feeling — always have this feeling

2. In the past, when you had to do something which depended upon cooperation with others, did you have the feeling that it:

1	2	3	4	5	6	7

_____

surely wouldn't get done — surely would get done

3. Think of the people with whom you come into contact daily, aside from the ones to whom you feel closest. How well do you know most of them?

1	2	3	4	5	6	7

_____

you feel that they're strangers — you know them very well

4. Do you have the feeling that you don't really care about what goes on around you?

1	2	3	4	5	6	7

*_____

very seldom or never very often

5. Has it happened in the past that you were surprised by the behaviour of people whom you thought you knew well?

1	2	3	4	5	6	7

*_____

never happened always happened

6. Has it happened that people whom you counted on disappointed you?

1	2	3	4	5	6	7

*_____

never happened always happened

7. Life is:

1	2	3	4	5	6	7

*_____

full of interest completely routine

8. Until now your life has had:

1	2	3	4	5	6	7

_____

no clear goals or purpose at all — very clear goals or purpose

9. Do you have the feeling that you're being treated unfairly?

1	2	3	4	5	6	7

_____

very often — very seldom or never

10. In the past ten years your life has been:

1	2	3	4	5	6	7

_____

full of changes without your knowing what will happen next — completely consistent and clear

11. Most of the things you do in the future will probably be:

1	2	3	4	5	6	7

*_____

completely fascinating — deadly boring

12. Do you have the feeling that you are in an unfamiliar situation and don't know what to do?

1	2	3	4	5	6	7

_____

very often very seldom or never

13. What best describes how you see life:

1	2	3	4	5	6	7

*_____

one can always find a solution to painful things in life

there is no solution to painful things in life

14. When you think about life, you very often:

1	2	3	4	5	6	7

*_____

feel how good it is to be alive

ask yourself why you exist at all

15. When you face a difficult problem, the choice of a solution is:

1	2	3	4	5	6	7

_____

always confusing and hard to find

always completely clear

16. Doing the things you do every day is:

1	2	3	4	5	6	7

*_____

a source of deep pleasure and satisfaction

a source of pain and boredom

17. Your life in the future will probably be:

1	2	3	4	5	6	7

_____

full of changes without your knowing what will happen next

completely consistent and clear

18. When something unpleasant happened in the past your tendency was:

1	2	3	4	5	6	7

_____

"to eat yourself up" about it

to say "ok that's that, I have to live with it," and go on

19. Do you have very mixed-up feelings and ideas?

1	2	3	4	5	6	7

_____

very often

very seldom or never

20. When you do something that gives you a good feeling:

1	2	3	4	5	6	7

*_____

it's certain that you'll go on feeling good

it's certain that something will happen to spoil the feeling

21. Does it happen that you have feelings inside you would rather not feel?

1	2	3	4	5	6	7

_____

very often

very seldom or never

22. You anticipate that your personal life in the future will be:

1	2	3	4	5	6	7

_____

totally without meaning or purpose

full of meaning and purpose

23. Do you think that there will always be people whom you'll be able to count on in the future?

1	2	3	4	5	6	7

*_____

you're certain there will be

you doubt there will be

24. Does it happen that you have the feeling that you don't know exactly what's about to happen?

1	2	3	4	5	6	7

_____

very often

very seldom or never

25. Many people – even those with a strong character – sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past?

1	2	3	4	5	6	7

*_____

never

very often

26. When something happened, you have generally found that:

1	2	3	4	5	6	7

_____

you overestimated or underestimated its importance

you saw things in the right proportion

27. When you think of difficulties you are likely to face in important aspects of your life, do you have the feeling that:

1	2	3	4	5	6	7

*_____

you will always succeed in overcoming the difficulties

you won't succeed in overcoming the

28. How often do you have the feeling that there's little meaning in the things you do in your daily life?

1	2	3	4	5	6	7

_____

very often very seldom or never

29. How often do you have feelings that you're not sure you can keep under control?

1	2	3	4	5	6	7

_____

very often very seldom

or never

Total SOC score: _____

Scaled score: _____

Appendix D – Informed Consent Document

Dear participant

Title of research: The role of sense of coherence in the relationship between levels of physical activity and self-esteem amongst students. **(Approval number:** UFS-HSD2017/1046**)**

Purpose of the Research:

You are invited to take part in a research study. Before giving consent to volunteer, it is important that you read through the following information to be sure you understand what will be expected of you.

This research study is designed to explore the role sense of coherence plays on the relationship between physical activity and self-esteem. The construct "sense of coherence" forms part of a salutogenic health model that comprises of three dimensions, namely: comprehensibility, manageability, and meaningfulness. This theoretical model was developed in order to explain maintenance or improvement of location on a health ease/dis-ease continuum and to expand the understanding of stressors, coping, and health. Self-esteem by definition means an individual's subjective view of him/herself, while physical activity can be defined as any movement in the body brought about by skeletal muscles, which results in the expenditure of energy. The study will consist of approximately 120 participants between the ages of 18-25, male and female, who is registered at the UFS. The aim of this study is to investigate whether sense of coherence has a moderating and/or mediating effect on the relationship between physical activity and self-esteem in students at the UFS.

If you choose to participate in this study, you will be asked to complete three measuring instruments, each consisting of a couple of questions. The completion of these scales should not take more than a maximum of 15 minutes. After completing all three scales your participation is fulfilled and you are not required to attend any follow-up sessions for more data collection. Follow-up sessions to discuss research findings will be scheduled with your residence once the study is completed, however attending this session is completely voluntary. You will not be compensated financially, or in any other way for your participation.

Your participation in the study as well as all information gathered will be handled with utmost respect and confidentiality. Your participation is entirely voluntary and you are under no obligation to take part in this study. If you do choose to take part, and an unforeseen issue arise which causes distress, you may at any time withdraw from the study with no judgement or any repercussions.

Your participation in this study will be greatly appreciated and I encourage you to see it as an opportunity to develop a better understanding of your body and mind.

Gerán Lordan (M. Soc. Sc. Clinical Psychology) Mrs. Ilse van Aardt (Study Leader)

2010061717@ufs4life.ac.za **vanaardti@ufs.ac.za**

Consent to participate in this study

I, _____ (full names of participant) confirm that the person asking my consent take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained to me in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without any penalty (if applicable).

I am aware that the findings of this study will be anonymously processed into a research report, journal publications and / or conference proceedings.

I agree to the recording of biographical data as well as data included in the Physical Activity Questionnaire for Adults, the Rosenberg Self-Esteem scale, and the Orientation to Life scale.

I have received a signed copy of the informed consent agreement.

Full name of participant: _____

Signature of participant: _____ Date: _____

Full names of researcher: _____

Signature of researcher: _____ Date: _____

Appendix E – Ethical Clearance Letter

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREESTATA
UFS·UV
HUMANITIES
GEESTESWETENSKAPPE

11 October 2017

Mr JS Lordan
Psychology
UFS

Ethical Clearance Application: The role of sense of coherence in the relationship between levels of physical activity and self-esteem amongst students (UFS-HSD2017/1046).

Dear Mr JS Lordan

I am pleased to inform you that your protocol has been successful in obtaining ethical clearance. However, please attend to the following:

The research design section says 'individuals with a physical disability will be excluded' while in all other sections the researcher notes that students 'with or without a disability will be included in the study.'

No resubmission is required.

Yours sincerely,

Prof Robert Peacock
Chairperson: Research Ethics Committee
Faculty of the Humanities

Copy: Charné Vercueil
Officer: Research Co-ordinator
Faculty of the Humanities

Appendix F – Letter from Language Editor

Statement with Regard to Language Editing of Mini Dissertation

13 Phesantekraal Street
De Bron
Bellville
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Cape Town
26 November 2018

I, Sam Prinsloo, (I.D. 8211120066084), hereby declare that I have language edited the mini-dissertation “The Role of Sense of Coherence in the Relationship Between Levels of Physical Activity and Self-Esteem Among Students” as presented to me by John Sebastiaan Lordan. All the suggested changes were left to the discretion of the author.

Yours sincerely

Samantha Prinsloo
0844326333
samprins@gmail.com
BA (US) 2003
BA Hons (US) 2004

Appendix G – Letter from APA Reference Editor

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Fichardt Park
9317
Tel (w): (051) 4012890
Cell: 0842004401
E-mail: jordaanj1@ufs.ac.za

27 November 2018

TO WHOM IT MAY CONCERN

STATEMENT WITH REGARD TO APA EDITING OF MINI DISSERTATION

Hereby I, Jacques Jordaan (I.D. 7905125022080), confirm that I have APA edited the following mini dissertation:

Title of mini dissertation: The role of sense of coherence in the relationship between levels of physical activity and self-esteem among students

Author: Mr. John Sebastiaan Lordan

Yours sincerely

Dr. J. Jordaan

Appendix H – Turnit-In Report

J.S. Lordan Master's Mini Dissertation Nov 2018

ORIGINALITY REPORT

10%	7%	6%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	etd.uovs.ac.za Internet Source	1%
2	Allison J. Tracy, Sumru Erkut. "Gender and Race Patterns in the Pathways from Sports Participation to Self-Esteem", Sociological Perspectives, 2016 Publication	1%
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