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ACCEPTANCE

This dissertation, THE RELATIONSHIP BETWEEN SELF-DETERMINATION THEORY AND PHYSICAL ACTIVITY PARTICIPATION VARIABLES TO EXERCISE SELF-DEFINITION AMONG AFRICAN-AMERICAN RETIREES, by GEORGE LEONARD SHAW JR., was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

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THE RELATIONSHIP BETWEEN SELF-DETERMINATION THEORY AND PHYSICAL
ACTIVITY PARTICIPATION VARIABLES TO EXERCISE SELF-DEFINITION AMONG
AFRICAN-AMERICAN RETIREES.

by

George L. Shaw Jr.

Under the Direction of Miles A. Irving, Ph.D.

ABSTRACT

This manuscript style dissertation is composed of three chapters. Chapter 1 is an introduction of the research problem and introduces some of the main areas that can impede African Americans from regularly participating in physical activity such as cultural & regional issues, presence of chronic diseases, and other issues. Chapter Two is a literature review on how autonomy support can facilitate self-determined motivation within individuals. It introduces how an individual can receive autonomy support from one source, multiple sources, or from an environment. Chapter Three is an empirical study assessing the relationship between self-determination theory and physical activity participation variables to exercise self-definition. One hundred and forty nine African American retirees who lived independently completed four outcome measures: Exercise Self-Definition (ESD) scale, Behavioral Regulations for Exercise Questionnaire-2/Relative Autonomy Index (BREQ2RAI), Godin Leisure Time Activity Scale (GLTEQ), and Basic Psychological Needs for Exercise Scale (BPNES). The investigator ran a correlation matrix to demonstrate relationships between the variables and a hierarchical linear regression analysis to determine significant predictors of physical activity participation (GLTEQ). The results revealed all the variables had statistically significant correlations, however, GLTEQ had the highest correlation with ESD (0.318). None of the psychological predictors was significant predictors of GLTEQ. In the final model, the ESD was two one-hundredths of a point over the criterion p-value (.05) for showing statistical significance in predicting GLTEQ among African American retirees. For the overall regression model, all factors explained 16.2% of the total model variance.

INDEX WORDS: Physical activity, Self-determination theory, Exercise psychology, African Americans, Exercise self-definition, Exercise identity

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A Dissertation

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Special Education, and Communication Disorders

in

the College of Education

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Atlanta, GA
2017

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DEDICATION

This dissertation is dedicated to my number one girl, my mother, Nadine H. Mitchell Shaw who was charged with the responsibility of raising her four boys to men. I thank you, momma, for the security in knowing that you would not only be proud of me after completing this arduous task, but that you would still love me even if I had not!

Love you to LIFE!!!!

Your oldest son,

Mookie

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ABBREVIATIONS

AAm	African American men
AAw	African American women
ALF/RC	Assisted Living Facility/Residential Care
BREQ-2/RAI	Behavioral Regulations Exercise Questionnaire/Relative Autonomy Index
BPNES	Basic Psychological Needs for Exercise
CET	Cognitive Evaluation Theory
ESD	Exercise Self-definition
GLTEQ	Godin Leisure Time Exercise Questionnaire
IDL	Independent Living
DL	Dependent Living
LTC	Long Term Care
NH	Nursing Home
PNSSES	Psychological Needs Satisfaction Exercise Scale
PA	Physical Activity
SDT	Self-Determination Theory
SES	Socioeconomic Status

Chapter 1

AN INTRODUCTION: PHYSICAL INACTIVITY WITHIN THE AFRICAN-AMERICAN COMMUNITY

The musculoskeletal system of humans is designed for mobility. Arguably, a toddler's second most exciting motor maturation experience, standing being the first, is perhaps to run. Hence, humans are not meant to live life in a state of sedation or immobilization. The adverse effects of sedentary behavior and immobilization on overall health have been documented (Tremblay, Colley, Sanderes, Healy & Owen, 2010). Yet, in the United States there is an epidemic phenomenon among all Americans, more so within the African-American (AA) community, regarding physical inactivity. This lack of physical activity (PA) participation has been associated with an increase in the prevalence of several chronic diseases that could be reversed with regular exercise if Americans met national guidelines for PA (American College of Sports Medicine (ACSM) & Centers of Disease Control (CDC), 2008). PA is as any bodily movements that results in energy expenditure. Exercise is a sub-category of physical activity (Caspersen et al., 1985).

According to Go et al., (2013), only 21% of adults met the 2008 federal PA guidelines for both aerobic and strengthening activity. By gender, physical inactivity was higher among women compared to men (33.2% vs 29.9%, age-adjusted) and increased with age from 26.1% to 33.4%, 40%, and 52.4% among older adults 18-44, 45 to 64, 65 to 74, and greater than 75 years of age respectively (Go et al., 2013). From a racial/ethnic perspective based on age adjusted estimates, non-Hispanic Whites (27.7%) were less likely to be physically inactive than other Non-Hispanic Blacks (41.1%) and Hispanics (42.2%) (Go et al., 2013). For adults 25 years old or older and not meeting federal PA guidelines, the percentage of people was inversely associated

with education. Individuals with no HS diploma (68.4%), some education (48.2%), or a bachelor's degree or higher (34.0%) did not meet full federal PA guidelines (Go et al., 2013). Because PA participation seems to decline as we age, the risk for physical inactivity participation of individuals over 65 is even higher. Only 35-44% of adults 75 years old or older are physically active, and 28-34% of adults ages 65-74 are physically active (USDHHS, 2016). Physical inactivity has been linked to increased healthcare costs for this age group (Elsawy & Higgins, 2010). African Americans are more likely to be less educated and physically inactive compared to Whites in America. Hence, they have an increased risk for developing chronic diseases that can be reduced with regular PA. However, African Americans may not participate in regular PA for reasons that include the presence of chronic diseases, culture, community/region barriers, motivation, and identity.

Chronic Diseases

Physical inactivity has been associated with an increased risk for the development of chronic diseases such as hypertension, Type 2 Diabetes, cancer, obesity, coronary artery disease, osteoporosis and osteoarthritis (Bopp et al., 2007; Haskell et al., 2007). African Americans have the highest prevalence of hypertension in the world and are almost twice as likely as their non-Hispanic White counterparts to have diabetes (Go et al., 2014). With regard to obesity, of non-Hispanic African Americans over 20 years of age, 63 % of men and 74% of women are overweight or obese (Go et al., 2014). Additionally, obesity and osteoarthritis have been linked empirically to coexist and the prevalence of both can be managed and mitigated with regular physical activity (Van Saase, Vanderbroucke, van Romande, & Valkenburg, 1988). The lack of weight-bearing activities experienced by those who do not participate in regular physical activities, particularly women, has been associated with the development of osteoporosis (Layne &

Nelson, 1999). The role physical inactivity plays in the development of these chronic diseases at an individual level has far-reaching implications culturally for African Americans.

Cultural and Social Concerns

Several cultural and social issues have led to physical inactivity within the African-American community. African-American women have been cited in several studies as being less physically active than men and women across other racial/ethnic groups (Brownson et al., 2000; Elyer et al., 2002). Bopp et al. (2007) stated in their study that participants listed the lack of social support as a reason for decreased PA engagement among African-American women (AAw). For AAw between the ages of 18 and 50, the lack of PA participation has been associated with lack of childcare, hair management issues, family commitment issues, the lack of financial resources to join a health club, working long hours, and performing manual labor jobs (Siddiqi, Tiro, & Shuval, 2011). For both African-American men (AAM) and AAw 50 years old and older, a lack of transportation, musculoskeletal disorders and physical ailments, lack of knowledge, poor motivation, and feelings of fatigue/tiredness were barriers for PA. In their qualitative study on exercise perceptions, Airhihenbuwa, Jumanyika, Agus & Lowe (1995) found culturally that low-income African Americans valued rest over exercise and considered rest to be a prerequisite for exercise. In the same study, African Americans also stated that due to their low education, they worked physically laborious jobs and therefore no additional exercise was needed. Moreover, AAM in low-income communities were more likely to exercise to build muscle as a way of defending themselves rather than for chronic disease prevention (Airhihenbuwa et al., 1995). Furthermore, older AAM stated they were less likely to engage in physical activity after retirement because of years of enduring hard physical labor or medical limitations (Airhihenbuwa et al., 1995).

Community/Regional

For both young and old African Americans, a lack of access to safe places to exercise has been a barrier to PA participation. A few studies have identified as a reason for physical inactivity among African Americans community issues such as unsafe neighborhoods (i.e. crime, violence, unleashed dogs) and lack of access to parks (Bopp et al., 2007; Siddiqi et al., 2011). The National Lung, Heart, and Blood Institute (NHLBI) in the 1980's, with the assistance of epidemiological evidence, identified eleven states that had a stroke incidence 10% higher than the national average. Regionally, Alabama, Arkansas, Georgia, Indiana, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia are collectively known as the Stroke Belt (NHLBI, 1996). African-American men and women in the Stroke Belt tend to have higher death rates from stroke than white men and women (NHLBI, 1996). The three major risk factors for stroke are hypertension, hypercholesterolemia, and diabetes. These risk factors can be mitigated with regular PA (CDC, 2014). Based on a large prospective study of Blacks and Whites living in the Stroke Belt, it was determined that regular PA was associated with a decreased risk for a transient ischemic attack (TIA) and stroke if one engaged in PA at least four times a week (McDonnell et al., 2013).

Motivation and Identity

Sandra Graham (1994) produced a literature review entitled the "Motivation of African Americans". Because of her research, she determined that most of the empirical literature surrounding African Americans' motivation was not grounded in a theory. Rather, it had been analyzed and interpreted based on socioeconomic status. Hence, past research suggested that poor academic motivation among African Americans was due to low socioeconomic status (SES) rather than cultural differences in psychological constructs when compared to their White counter-

parts (Graham, 1994). These comparisons within the academic motivation literature often suggested that African Americans who were impoverished would not be academically motivated (Graham, 1994). This same perspective toward the motivation of African Americans can be seen in the context of PA motivation. Pekmezi, Barbara, Bodenlos, Jones, and Brantley (2009) investigated best practices for increasing PA participation among low income African Americans with high rates of chronic diseases (e.g. obesity, hypertension) using a home-based PA program versus a control program. The participants were randomized into groups and the results suggested that there was no significant difference in activity participation between the two groups as a result of exercise program mode or delivery. However, the researcher stated the lack of effectiveness of the intervention could be attributed to his research design/methodology rather than low SES. The methodology used in the African American sample was the one previously used among Whites and therefore the intervention implemented for this study may have lacked cultural relevance for the African American sample (Pekmezi et al., 2009). Hence, the attitude among low-income African Americans and lack of effectiveness for the intervention in the Pekmezi et al. study may have more to do with cultural differences than socioeconomics.

Many researchers do agree with the robustness of self-efficacy as an influential motive in predicting exercise behavior (Warner, Schuz, Knittle, Ziegelman, & Wurm, 2011; Wesch, Milne, Burke, & Hall, 2006). Self-efficacy is defined as one's perceived confidence and capability in a particular domain (Bandura, 1977). This is important as African-American adults have cited a lack of confidence and poor motivation as barriers to PA participation (Resnick, Vogel, & Luisi, 2006; Schutzer & Graves, 2004). Additionally, other motivational frameworks such as the transtheoretical model and theory of planned behavior have been used frequently to predict exercise behaviors (Sabin, 2005). However, perhaps a more recent theoretical framework, self-

determination theory (SDT), demonstrates promising findings in evaluating exercise behavior (Wilson, Mack, & Grattan, 2008). This theory is based on the need to satisfy inherent psychological needs to develop the innate drive to carry out motives and enjoy them for the innate feelings of pleasure these behaviors generate (Ryan & Deci, 2000). The SDT theory addresses two of the essential motivation issues (lack of knowledge and lack of motivation) AAs have suggested limits their PA participation. Additionally, SDT addresses the role of an individual's identity in adopting new behaviors as suggested by organismic integration theory. Yet, this particular theory has not been well studied among African Americans.

Another aspect of the PA participation that has not been explored enough within the African American population is exercise identity. Kendzierski, Furr, & Schiavoni (1994) suggested that an individual's self-perception can have significant implications for regular exercise engagement. In a longitudinal study, Hays, Pressler, Damush, Rawl, and Clark (2010) found that as exercise self-definition strengthened over time, so did exercise adoption among AAw. Also, the "value of exercise" subscale was most predictive of the three subscales of exercise adoption. In an earlier study, Hays, Damush, and Clark (2005) found that as exercise participation increased so did exercise self-definition among AAw. Also, "value of exercise" had the highest mean value over the other two subscales. The role of identity (how one sees him or herself) and motivation (what drives an individual's behavior) together may play key roles in predicting and strengthening physical activity participation among African Americans.

Rationale

The dialogue concerning physical inactivity among African Americans has been ongoing. There have been several barriers identified and interventions developed to improve this issue; however, it appears that this physical inactivity dilemma among African Americans persists. The purpose of this study is to investigate the relationship between SDT variables, physical activity participation, and exercise self-definition to determine which variables best predicts physical activity participation among a sample of African Americans retirees.

Significance of Study

The number of individuals living over the age of 65 in America is increasing faster than the total U.S. population (U.S. Census Bureau, 2011). Individuals who were born between the years of 1946 to 1964, “baby boomers,” largely make up this aging American population. Unfortunately, many of these individuals are also experiencing declining health. Much of the decline within this population can be attributed to the development of chronic diseases. Physical activity has been cited as one of the primary methods of reducing the chances of developing chronic disease(s), decreasing the risk of frailty, and maintaining functional independence as we age (Chou, Hwang, & Wu, 2012). Since aging has been associated with decreased function, it is imperative that older Americans, especially African Americans, remain engaged in some level of daily PA. The benefits of regular exercise or physical activity participation far exceed consequences of physical inactivity as it relates to a good quality of life.

Chapter Two of this dissertation is a literature review. It provides an overview of studies that used SDT to explain exercise behavior among adults and older adults. The majority of the research participants in these studies are non-African Americans. There are no published studies with all African Americans participants using SDT as the framework to assess exercise behavior,

yet older African Americans have the highest risk for physical inactivity. The third chapter is an empirical study that will investigate the relationships between SDT variables, physical activity participation, and exercise self-definition as well as determine predictors of physical activity participation. The sample was comprised of African-American retirees living in independently.

References

- Airhihenbuwa, C. O., Kumanyika, S., Agurs, T. D., & Lowe, A. (1995). Perceptions and beliefs about exercise, rest, and health among African Americans. *American Journal of Health Promotion, 9*(6), 426-429.
- Bandura, A. (1977). Toward a unifying theory of behavioral change. *Psychological Review, 84* (2), 191-215.
- Bopp, M., Lattimore, D., Wilcox, S., Laken, M., McClorin, L., Swinton, R., Gethers, O. and Bryant, D. (2007). Understanding physical activity participation in members of an African American church: A qualitative study. *Health Education Research, 22*(6), 815-826.
- Brownson, R. C., Eyler, A. A., King, A. C., Brown, D. R., Shyu, Y. and Sallis, J. F. (2000). Pattern and correlates of physical activity among U. S. women 40 years and older. *American Journal of Public Health, 90*(2), 264-270.
- Centers for Disease Control/American College of Sports Medicine (CDC/ACSM), Centers of Disease Control and Prevention. (2008). *The 2008 Physical activity guidelines for Americans*. Retrieved from <http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html>
- Chou, C., Hwang, C., & Wu, Y. (2012). Effect of exercise on physical function, daily living activities, and quality of life in the frail older adults: A meta-analysis.

- Archives of Physical Medicine and Rehabilitation*, 93(2), 237-244.
- Elsway, B. and Higgins, K. E. (2010). Physical activity guidelines for older adults. *American Family Physicians*, 81(1), 55-59, 60-62.
- Elyer, A. E., Wilcox, S., Matson-Koffman, D., Evenson, R. R., Sanderson, B., Thompson, J., Wilbur, J., and Rohm-Young, D. (2002). Correlates of physical activity among women from diverse racial/ethnic groups. *Journal of Women's Health and Gender-based Medicine*, 11(3), 239-253.
- Go, A. S. et al. (2013). Heart disease and stroke statistics- Update 2014: A report from the American Heart Association. *Circulation*, 129(3), e28-e292.
- Graham, S. (1994). Motivation in African Americans. *Review of Educational Research*, 64(1), 55-117.
- Haskell, W. L., Lee, I, Pate, R. R., Powell, K. E., & Blair, S. N. (2007). Physical activity and public health: Updated recommendations for adults from the American College of Sports Medicine and American Heart Association. *Medicine and Sciences in Sport & Exercise*, 39(8), 1423-1434.
- Hays, L. M., Damush, T. M., & Clark, D. O. (2005). Relationships between exercise self-definition and exercise participation among urban women in primary care. *Journal of Cardiovascular Nursing*, 20(1), 9-17.
- Hays, L. M., Pressler, S. J., Damush, T. M., Rawl, S. M., & Clark, D. O. (2010). Exercise adoption among older, low income women at risk for cardiovascular disease. *Public Health Nursing*, 27(1), 79-88.
- Hill, A., Hoffmann, T., McPhail, S., Beer, C., Hill, K. D., Brauer, S. G., & Haines, T. P.

- (2011). Factors associated with older patient's engagement in exercise after hospital discharge. *Archives of Physical Medicine and Rehabilitation*, 92(9), 1395-1403.
- Kendzierski, D., Furr Jr., R. M., & Schiavoni, J. (1998). Physical activity self-definition correlates and perceived criteria. *Journal of Sport & Exercise Psychology*, 20(2), 176-193.
- Layne, N. E. & Nelson, M. E. (1999). The effects of progressive resistive training on bone density: A review. *Medicine and Science in Sports and Exercise*, 31(1), 25-30.
- McDonnell, M. N., Hiller, S. L., Hooker, S. P., Le, A., Judd, S. E., and Howard, V. J. (2013). Physical activity frequency and risk of incident of stroke in a national U.S. study of blacks and whites. *Stroke*, 44(9), 2519-2524.
- Pekmezi, D. W., Barbara, B. L., Bodenlos, J. S., Jones, G. N., & Brantley, P. J., (2009) Promoting physical activity in low income African Americans: Project LAPS. *Journal of Health Disparities Research and Practice*, 3(2), 82-91.
- Phillips, E. M., Schneider, J. C., & Mercer, G. R. (2004). Motivating elders to initiate and maintain exercise. *Archives of Physical Medicine and Rehabilitation*, 85(7), s52-s57.
- Resnick, B., Vogel, A., & Luisi, D. (2006). Motivating minorities older adults to exercise. *Cultural Diversity and Ethnic Minority Psychology*, 12(1), 17-29.
- Ryan, R. M. & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Siddiqi, Z., Tiro, J. A., & Shuval, K. (2011). Understanding impediments and enablers to physical activity among African American adults: A systematic review of qualitative studies. *Health Educational Research*, 26(6), 1010-1024.

- Schutzer, K. A. & Graves, B. S. (2004). Barriers and motives to exercise in older adults. *Preventive Medicine*, 39(5), 1056-1061.
- Tremblay, M. S., Colley, R. C., Saunders, T. J., Healy, G. N., & Owen, N. (2010). Physiological and health implications of a sedentary lifestyle. *Applied Physiology, Nutrition, & Metabolism*, 35(6), 725-740.
- United States Department of Health and Human Services. (2008). *2008 Physical Activity Guidelines for Americans*. Retrieved from <http://www.health.gov/paguidelines/pdf/paguide.pdf>
- U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute (NHLBI). (1996). *NHLBI Stroke Belt Initiative*, Retrieved from http://www.nhlbi.nih.gov/files/docs/resources/heart/sb_spec.pdf
- U.S. Department of Commerce, U.S. Census Bureau. (2011). *Census shows 65 and older population growing faster than total U.S. population*. Retrieved from https://www.census.gov/newsroom/releases/archives/2010_census/cb11-cn192.html
- Van Saase, J. L., Vanderbroucke, J. P., van Romande, L. K., & Valkenburg, H. A. (1988). Osteoarthritis and obesity in the general population: A relationship calling for an explanation. *The Journal of Rheumatology*, 15(7), 1152-1158.
- Wesch, N. N., Milne, M. I., Burke, S. M., & Hall, C. R. (2006). Self-efficacy and imagery use in older adult exercisers. *European Journal of Sport Exercise*, 6(4), 197-203.
- Warner, L. M., Schuz, D., Knittle, K., Ziegelman, J. P., & Wurm, S. (2011). Sources of perceived self-efficacy as predictors of physical activity in older adults. *Applied Psychology: Health & Well-being*, 3(2), 172-192.

Wilson, P. M., Mack, D. E., & Grattan, K. P. (2008). Understanding motivation for exercise: A self-determination theory perspective. *Canadian Psychology*, 49(3), 250-256.

Chapter 2

AUTONOMY SUPPORT, BEHAVIORAL REGULATIONS, AND PSYCHOLOGICAL NEEDS AND THEIR INFLUENCE ON PHYSICAL ACTIVITY PARTICIPATION AMONG OLDER ADULTS

Review of Literature

Autonomy support in physical rehabilitation can be useful in facilitating a patient's return to a normal life. In long-term care (LTC) settings, residents are likely to experience conversations about health and physical activity with both healthcare professionals and non-healthcare professionals such as family members and friends prior to engaging in an exercise program. In an effort to promote residents' natural engagement in physical activity, autonomy supportive strategies may be implemented. Within the framework of Self-Determination Theory (SDT), engagement in new health behaviors such as physical activity is best received when the individual is provided with choices, given a rationale as to why they should change their behavior, and when the individual's perspective is acknowledged in the process (Deci, Eghrar, Patrick, & Leone, 1994). These three principles for facilitating autonomy support promote self-determined behaviors and can be delivered in a number of ways.

Multiple Sources of Autonomy Support

It is believed that the strength of the interrelationship may play an important role how likely an individual will follow supportive advice. When individuals have to choose between multiple sources of autonomy support, they often choose to follow the advice of a significant other. In a study conducted in the United Kingdom, Rouse, Noutmanis, Dud, Jolly and Williams (2011) investigated how autonomy support, provided by multiple significant others, can affect the emotional well-being and PA intentions of exercisers. A partner, physician/nurse, and off-

spring were the three most frequently selected significant others selected by a sample of 216 adults. Of the three, a partner was defined as “the significant other most important in their decision making attempt to become more physically active” (Rouse et al., 2011). Additionally, the researchers found that autonomy support from the partner and physician/nurse significantly affected PA intentions while autonomy support from offspring did not. Conversely, autonomy support provided by partners predicted greater risk for depressive symptoms compared to autonomy support provided by an offspring or physician/nurse.

In some cases, multiple sources of autonomy support are necessary. This may be especially true for people who are athletes. Chan, Hagger, and Spray (2011) found that both professional and amateur athletes’ sport and treatment motivation differed with respect to autonomy support received by both the sport coach and the physiotherapist based on the stage of injury recovery. In the early stages of recovery from a physical injury, the autonomy support received from the physical therapist had a greater impact on treatment motivation, while in later stages of the recovery period, when the patient was ready to transition back into the sport, the autonomy support received from the sport coach had the greater impact on motivation. In the medical community, patients tend to trust their physician’s recommendation over other health professionals (Fiscella et al., 2004). Fortier, Sweet, O’Sullivan, and Williams (2007) provided support for this point when they found that individuals who received autonomy support from a physical activity counselor did not fare as well in their exercise program as those who received autonomy support from a medical doctor/nurse practitioner and counselor. However, patients do not always have immediate access to physicians and therefore may have to rely on other medical professionals for medical advice. In long-term care settings, residents may have to rely on nurses, physician

assistants/nurse practitioners, and rehabilitation professionals to advise them on PA due to the lack of physician presence.

Another group of researchers examined the effects of three modes of exercise on older adults' subjective vitality with a varying number of autonomy supporters in each group (Solberg, Halvari, & Ommundsen, 2013). This inquiry was conducted among community dwelling Norwegians with an average age of 74.2 years. The investigators composed four groups, one of which was the control group. The endurance-training group had two instructors, the functional training group had two instructors, the strength-training group had one instructor, and the control group had no instructor. The groups with at least two instructors (i.e. autonomy supporters) and the most participants (i.e. endurance and functional training groups) had the best outcomes compared to the single instructor, small group. The findings suggest that in a group exercise settings, multiple sources of autonomy support may be beneficial especially for older adults who may need additional assistance and one-on-one attention with physical activity.

Single Sources of Autonomy Support

A single source of autonomy support occurs when only one person provides the feedback to promote autonomy. This type of autonomy support is common with medical professionals who are working with clients with significant physical impairments or require considerable attention (e.g. one-on-one) due to higher risk for further injury or decreased motivation (Haupt et al., 2003). For individuals in long-term care settings, a single source of autonomy support may be particularly effective for older adults who are at risk for falls or have developed a fear of falling as a result of anxiety associated with standing or balance activities (Dacey & Newcomer, 2005). Russell and Bray (2010) investigated the effect of a single source of autonomy support among males receiving cardiac rehabilitation as a result of physician referral due to cardiovascular dis-

ease. Among a sample of 116 Canadian males, the researchers found a significant positive correlation between autonomy support and self-determined motivation. This relationship between autonomy support and an increase in self-determined behavior led to individuals performing at longer durations during sessions and exercising more frequently (i.e. total exercise volume) per week. Age can be a moderator in determining the effectiveness the autonomy support provided by a single individual in certain settings. Levy, Polman, and Borkoles (2008) found that in an outpatient setting, an autonomy supportive environment provided by the physical therapist was not as effective with improving rehabilitation program adherence for older adults as compared to younger patients. The findings suggest that older adults in certain environments may require higher levels of autonomy support to abate aging related issues such as decreased strength and fear of the permanent loss of function while engaging in physical rehabilitation exercises post-injury (Levy et al., 2008). Older individuals with disabilities who seek physical rehabilitation may benefit more from single sources of autonomy support, especially in outpatient settings, compared to multiple sources.

Environmental Autonomy Support

One of the primary goals for anyone who is undergoing physical rehabilitation is to return to their prior level of function (O'Sullivan, 2014). This translates into being able to perform tasks and functions he or she was able to perform prior to injury. Therefore, rehabilitation professionals spend time developing challenging and meaningful treatment sessions, evaluating function and patient's responses to sessions, and facilitating mobility skills that will allow the individual to restore function in future sessions (O'Sullivan, 2014). Many of the tasks are simulations that the patient will encounter in their home environment. Therefore, it is the hope of the rehabilitation professional that if the individual can be successful with each encountered simulation task,

then those skills will transfer over into their natural environment once they leave. Likewise, Valerand (1997, 2000) suggested that the construct of human motivation is represented at three levels: specific, contextual, and global. He stated that “specific motivation” implies that motivation can be different at any given time or context (e.g. while overcoming an injury). Contextual motivation refers to how people regulate motives in a given context and is heavily influenced by perceptions of autonomy support (e.g. in an academic environment). Lastly, global motivation is a general disposition to behave or perceive actions and environments as autonomous across a number of contexts. This trans-contextual model provides a framework for understanding how motivation can be transferred from one context (e.g. sport) to another (e.g. academic) (Chatzisarantis & Hagger, 2009; Hagger, Chatzisarantis, Barkoukis, Wang & Baranowski, 2005; Hagger, Chatzisarantis, Culverhouse & Biddle, 2003). Chan et al. (2011) tested the treatment motivation among individuals rehabilitating a sports injury using the trans-contextual model. The study indicated that motivation did transfer across contexts such that athletes with high autonomous motivation in a sport also had high autonomous motivation during rehabilitation.

The cognitive evaluation theory (CET), a sub-theory of SDT, is concerned with those factors in the environment that can either facilitate or undermine intrinsic motivation development (Deci & Ryan, 2000). A psychological need that is important for all intrinsic motivation development is autonomy (Deci & Ryan, 2000). In some long-term care facilities where patients are not able to demonstrate the ability to perform activities safely, staff members (Riedl, Mantovan & Them, 2013) can inhibit autonomy development. This is because many individuals in nursing homes are medically ill and are physically disabled. Yet, all residents deserve the right to make choices and have the opportunity to determine their fates as much as possible or as they are able. Hence, promoting environments that facilitate the development of autonomy support may lead to

an increase in the individual's perception of their autonomy. Phillippe and Vallerand (2008) investigated the role of autonomy supportive environments on the perceptions of autonomy and assessed psychological adjustment within a motivation sequence within a nursing home setting among the elderly. The study included 83 Canadian, nursing home residents with a mean age of 80.48 years. The findings from this study suggest that an autonomy supportive environment did lead to greater perceptions of autonomy by residents. Additionally, Phillippe and Vallerand's (2008) study reported that actual environments could either facilitate or inhibit need for autonomy and hence mediate the individual's motivation. Furthermore, self-determined motivation (intrinsic motivation) mediated the relationship between perceptions of autonomy and psychological adjustment long term. These findings provided significant implications for the quality of care received by residents; perhaps how they feel about their care in certain long-term care facilities affects their feelings of autonomy.

In a stroke physical rehabilitation environment, facilitating autonomy support among patients may be a more deliberate, calculated process for healthcare professionals as they strive to facilitate motor control in different areas of the body (Proot, Meulen, Abu-Saad, & Crebolder, 2007). A stroke can cause permanent neurological damage; most strokes result in significant motor impairments that manifest into gross physical disability and as a result, recovery is slow (Krabauer, 2006). Rehabilitation professionals such as physical therapists, occupational therapists or speech therapists each facilitate autonomy support based on level of function or risk of injury. For example, because of the neurological damage associated with a stroke, an individual with a stroke may not be allowed to ambulate without assistance early in the rehabilitation phase due to their increased risk for falling. Over a period, Proot et al. (2007) stated that as the patients get stronger, the task challenges the rehabilitation staff provide to the patients become more chal-

lenging and they master these challenges, the patients build their confidence and strength. Proot et al. (2007) proposed that as autonomy increased the patients' role in rehabilitation moves from a passive role to an active role. For persons with a stroke, environmental autonomy support provides a much needed collective approach to fulfilling psychological needs of the patient. This is because not only is the patient dealing with physical disabilities, but also emotional issues such as depression that can lead to apathy or amotivation toward physical activity (Hackett, Yapa, Parog, & Anderson, 2005). Healthcare professionals and others are promoting positive well-being when they reinforce autonomy and other psychological needs within a supportive environment (Ryan & Deci, 2000).

Behavioral Regulations and Psychological Needs for Physical Activity among Adults

Self-determination theorists have identified that personality and the fulfillment of an individual's psychological needs can influence physical activity (Gunnell, Crocker, Wilson, & Mack, 2013; Kirkland, Karlin, Stellino, & Pulos, 2011; Sebire, Standage, & Vansteenkiste, 2009; Springer, Lamborn, & Pollard, 2013). Ryan and Deci (2000) suggested that as an individual's psychological needs of autonomy, competence, and relatedness are fulfilled, self-determined behaviors would emerge. The magnitude of fulfillment regarding psychological needs can be categorized into one of five behavioral regulation typologies: intrinsic regulation, identified regulation, introjected regulation, external regulation, and amotivation (Markland & Tobin, 2004). Intrinsic regulation is synonymous with intrinsic motivation and represents an activity done for inherent reasons (Ryan & Deci, 2000). It represents the highest form of self-determination and the most autonomous regulation; hence, all psychological needs are fulfilled. Identified regulation is the recognition or conscious valuing of a behavioral goal or regulation such that the person owns the behavior (Ryan & Deci, 2000). Introjected regulation occurs when the individual takes on a

regulation but does not fully accept it as part of their identity (Ryan & Deci, 2000). It is a controlled form of regulation used to avoid guilt or anxiety. External regulation is the least autonomous form of the behavioral regulations, the behaviors are performed to satisfy external demand or reward contingency (Ryan & Deci, 2000). Amotivation is apathy such that the individual has no drive to engage in activity. Together, both psychological needs and behavioral regulations can be used to identify those individuals who have the potential to engage in regular PA and be successful, those who may need assistance in beginning PA, or individuals completely apathetic toward PA (Fortier, Duda, Guerin, & Teixeira, 2012; Vlachopoulos, Letsiou, Palaiologou, Lep-tokaridou, & Gigoudi, 2010). For older residents in LTC settings, sedentary behavior is pervasive and can often lead to an increased risk of developing frailty (Phillips & Flesner, 2013; Tribess, Virtuoso Junior, & de Oliveria, 2012). Hence, for individuals living in LTC, this information may be valuable towards improving overall health within these historically inactive communities with regard to promoting PA involvement.

Personality

Studies conducted with older adults using SDT have yielded some interesting results as it relates to personality. However, many of these studies were performed with participants who were already physically active, have a mid to high socioeconomic status and are well educated (Ferrand, Nasarre, Hautier, & Bonnefoy, 2012; Ferrand, Martinent, & Bonnefoy, 2014; Kirkland et al., 2011). Those studies reported that a very small percentage of the participants had external behavioral regulation or amotivation personality types. Hence, people in those studies were more likely to be physically active because of their education and SES. Prior research supports the positive association between SES and PA participation (Pampel, Krueger, & Denney, 2010). In both studies performed by Ferrand et al. 2012 and 2014, the investigators reported low levels

of external regulation and amotivation among their cluster samples of 92 and 100 Frenchmen and women, respectively. Therefore, many of these individuals exercised for enjoyment, had knowledge of benefits of exercise, or because they likely participated in such activities over their lifetimes. Kirkland et al. (2011) performed a study that investigated the psychological needs satisfaction and exercise behaviors in older adults. Specifically, they wanted to profile, and compare and contrast, exercise behaviors of older adult non-exercisers with those of older adult exercisers. As suggested by Kirkland et al. (2011), older adult exercisers were more intrinsically motivated (i.e. fitness improvements, social/emotional health, and stress management) compared to older adult non-exercisers who had non-self-determined extrinsic motivation (i.e. appearance and weight management). Furthermore, those who identified as older adult exercisers had fulfilled psychological needs.

The role of behavioral regulations, psychological needs fulfillment and the formation of a physical active self among physically active and sedentary adults can have a significant impact on exercise adherence (Hays, Damush, & Clark, 2005; Hays, Pressler, Damush, Ravi & Clark, 2010; Vlachopoulos et al., 2011). In SDT terms, a positive exercise identity (i.e. physically active self, exercise self-definition) is congruent with positive exercise adherence, which is most likely to occur when psychological needs are fulfilled leading to internalized exercise behaviors (Springer et al., 2013). Hays et al. (2005) suggested that positive exercise self-definition is based on three components: value of exercise, perceived competence, and perceived acknowledgment regarding exercise. However, in the development of a physically active self, findings from two studies suggest that African Americans may differ conceptually on the value they place on exercise compared to Caucasians. For example, Hay et al. 2005 and Hay et al. 2010 found that the “value of exercise” had the biggest influence on exercise self-definition among low-income

AAw study. Value of exercise was defined as the “perceived enjoyment and importance of exercising”. In contrast, mid to high SES Caucasians who exercised expressed their value of exercise as “feeling fit” and thought of exercise in terms of maintaining their fitness (Springer et al., 2013). However, this positive perspective regarding the value of exercise at least among elderly, community-dwelling, low-income African Americans may not exist. For example, Airhihenbuwa, Kumanuika, Agurs, and Lowe (1995) reported that among community dwelling low-income African Americans, due to their lack of education, viewed working their physical labor jobs as their exercise. Because of low socioeconomic status and education, these same individuals are likely to become NH residents (Angelelli et al., 2006). According to the study, African American residents in NHs tend to have more physical disability due to prevalence of chronic diseases than Caucasians (Angelelli, Grabowski, & Mor, 2006; Institutes of Medicine, 1981). Hence, poor health and working physically demanding jobs during one’s life may be contributing to a poorly perceived value toward physical activity among this population.

Psychological Needs

Hunt and Ells (2011) introduced the term “relational autonomy”, highlighting the collective influences of the patient, family, and health care professionals in facilitating independence in a physical rehabilitation setting. Rehabilitation professionals provide patients with physical rehabilitation at nursing homes while facilitating autonomy. However, permanent nursing home residents, in particular, may not have opportunities to apply newly learned skills in a practical manner due to the nursing staff rules within nursing homes (Riedl et al, 2013). This dichotomy among nursing home staff members (i.e. rehab staff vs nursing staff) in facilitating personal autonomy of residents can be frustrating for the residents and stifle their drive to be more independent. In contrast, relational autonomy is based on the relationships with others to be effective

in the facilitation of autonomy. Furthermore, relational autonomy is more in line with promoting the fulfillment of psychological needs such as autonomy, competence, and relatedness. This is needed to promote the positive social development and well-being, which are goals of physical rehabilitation settings (Hunt & Ells, 2011). Markland and Tobin (2010) investigated the role of psychological needs as mediators between need support and the five behavioral regulations among adult women who had exercise referrals for weight management. They found that need support was positively related to all psychological needs, with the strongest effect being on personal relatedness. Moreover, the construct of relatedness was found to consist of two components: social assimilation and personal relatedness. The personal relatedness was associated with identified regulation while social assimilation was associated with amotivation, external regulation, and introjected regulation (Markland & Tobin, 2010). According to Kirkland et al. (2011), the older women reported a greater psychological need for “relatedness” when engaging in PA than the men. It appears that relationship building that promotes exercise enjoyment may be the key factor in engaging older women to participate in regular physical activities (Brunet & Sabiston, 2011). The psychological need of relatedness is correlated to autonomy support in an exercise context (Edmunds, Ntoumanis, & Duda, 2006).

Long Term Care Settings and Autonomy Support

Nursing Homes.

Long-term care residents in nursing homes are more likely to be in declining health leading to immobility, increased depression, reduced social interaction, and decreased autonomy (Walsh & Waldmann, 2008). Predominately African-American nursing homes are more likely to have residents with a number of negative conditions. Examples of these conditions are an increased proportion of residents with pressure sores, cognitive and physical impairments, poorly

qualified staff, poorer patient/staff ratios, younger males, less educated residents, and a facility in need of repairs when compared to predominately White nursing homes (Grabowski & McGuire, 2009; Howard et al., 2002; Konetzka & Werner, 2009; Smith, Feng, Fennell, Zinn, & Mor, 2008). These conditions do not provide an optimal environment for promoting autonomy or fulfilling psychological needs which promote well-being. In particular, the loss of autonomy or apathy can play a significant role in the decline of physical abilities and changes in emotional behaviors among older adults, causing them to disengage in regular PA (Dacey, Baltzell, & Zaichkowsky, 2008). Dacey et al. (2008) reported in their study, which included 645 community dwelling older adults with a mean age of 63.8 years, enjoyment of exercise was a major factor delineating those who regularly participated in PA compared to those who exercise less frequently. Contrastingly, the organizational structure and culture of NHs is stifling, controlling, and rarely facilitates autonomy (O'Conner & Vallerand, 1994; Walsh & Waldmann, 2008). Hence, residents in these controlled settings are likely to have non-self-determined behavioral regulations when it comes to physical activity participation (O'Conner & Vallerand, 1994). As environmental attributes, choice and control are often viewed as positive as they have been associated with facilitating a high internal locus of control and positive psychological adjustment among individuals within that environment (Moos, 1981; Timko & Moos, 1989; Wolk, 1976). However, choice and control are limited within nursing home environments as residents typically lack physical abilities or are highly dependent for care (Schussler, Dassen, & Lohmann, 2014). Additionally, O'Conner and colleagues (1994) found that the motivational profiles (e.g. self-determined vs non-self-determined) of NH residents were not always congruent with the environmental qualities of the NH. This finding suggested that while some residents in nursing homes will not or cannot behave in an independent manner, other residents choose to be very independent and en-

gaged in their life decisions. As a result, there can be disharmony between the resident and NH environment.

Assisted Living/Residential Care.

Researchers suggest that PA for nursing home residents is to prevent the development of frailty or delay the deterioration of physical function. Physical activity is used in residential communities (RC)/assisted living facilities (ALF) to keep its residents out of NH (Phillips & Flesner, 2013). Assisted living facilities have become synonymous with espousing their residents' independence (Ball, Perkins, Whittington, Hollingsworth, King, & Combs, 2004). Similarly, independence has been shown to be a key indicator of quality of life (Ball et al., 2000). For residents in ALF/RCs, independence encompasses several factors such as self-reliance, maintaining an identity, maintaining meaningful activities, a valued role in community, autonomy, avoiding dependence, and maintaining function (Ball et al., 2004). The importance of autonomy and the avoidance of dependency are very congruent attributes of residents living in ALF/RCs. Ball et al. (2004) further asserted that independence is supported within these facilities. Peri, Kerse, Robinson, Parson, and Lathan (2008) investigated whether a functional activity based program improved health status, life satisfaction, and mobility among a group of frail, low-level dependent older adults living in residential care facilities with a mean age of 84.7 years. The authors' findings suggested that the treatment group showed an increase in life satisfaction and health status only, not in mobility, in the first three months. Mobility remained constant in both groups throughout the entire research period. At six months, neither group was significantly different on any of the outcome measures (Peri et al., 2008). However, in the short term, regular PA did benefit health status and life satisfaction for the intervention group and there was no decrease in mobility function. Because researchers know that at least 30% of older people experience decline in

PA after entry into ALFs/RCs (Ruuskanen & Parkatti, 1994), there is a strong need to incorporate PA programs into facilities to mitigate the neuromuscular and cardiopulmonary deficits associated with the aging process. While there may be no immediate long-term results among older adults who regularly participated in exercise in the aforementioned study, perhaps the engagement itself may facilitate an increase in activities mitigating the loss of function for some. Additionally, there is a need to educate patients, particularly those with poor education and blue-collar backgrounds, why PA is important and identify those at risk for non-participation in physical activities since research suggests that PA levels decreased as we progress into adulthood (Haskell et al., 2007). Nies, Troutman-Jordan, Branche, Moore-Harrison, and Hohensee (2013) suggested that an environment with group activities (i.e. promotes relatedness) and a community health worker (i.e. autonomy supporter) can play a major role influencing low-income older African Americans to participate in PA. Additional research is needed to discover ways of improving PA among African Americans who have the lowest PA participation rates among all races and ethnicities while simultaneously having the highest rates of chronic disease prevalence.

Discussion

Older adults, especially minorities, are not engaging in the recommended amounts of physical activity (King & King, 2010). One study suggested that older adults participated in PA at rates of less than 40% even after hospitalization (Hill et al., 2011). Additionally, exercise motivation tends to decline among adults as they age (Wallace & Lahti, 2005). Self-determination theory is one of many frameworks used for assessing the phenomenon of PA behavior. Developed by Deci and Ryan (2000), SDT provides a framework of understanding the role of psychological needs fulfillment in facilitating self-determined, autonomous behaviors that can influence the individuals' desire to engage in activities such as exercise. In the context of PA, when one

does not have their psychological needs fulfilled they are less likely to engage in regular PA. Studies within this literature review provide both longitudinal and cross-sectional support for role of autonomy support in facilitating autonomous behaviors as well as the relationship between the psychological needs and behavioral regulations.

More specifically, the relationship between the provider of autonomy support (i.e. important other) and the autonomy support target (i.e. the individual(s)) affects how the autonomy support is received. In most cases, the research suggested that autonomy support from a respected partner or health care professional is in most cases more valued when compared to other autonomy sources. Autonomy support plays an important role in promoting physical activity, especially among those with health issues. After experiencing hospitalization, transitioning from a state of illness to one of wellness can be a difficult transition. Healthcare professionals (e.g. physical therapists and exercise physiologists) are excellent sources of support. At least in some situations, input from multiple healthcare professionals may be more beneficial than a single source. Moreover, the type of profession, relationship with the individual, as well as the age of the person may affect the effectiveness of the autonomy support.

The behavioral regulations/exercise typologies of the participants in the reviewed studies affirmed the theoretical propositions purported by SDT. In the studies, individuals who displayed more autonomous forms of behavioral regulations experienced more favorable outcomes as it related to issues such as exercise adherence, well-being, rehabilitation motivation, and weight loss management (Thogersen-Ntoumani & Ntoumanis, 2006; Weman-Josefsson, Lindwall, & Ivarsson, 2015). Self-determination theory suggests that those individuals who have their psychological needs satisfied are more likely to have an enhanced propensity to be intrinsically motivated, improve their well-being, and experience positive social development compared to those

who do not have their needs met (Ryan & Deci, 2000). Of the three psychological needs, the psychological need of autonomy was suggested by one study that it should be primarily reinforced over the other psychological needs to facilitate internalization (deCharms, 1968). A second study suggested that both autonomy and competence, in particular, have a symbiotic relationship. Therefore, one is not enhanced without the presence of the other in most cases (Ryan, Patrick, Deci, & Williams, 2008). Hence, the psychological need of autonomy seems to be central to intrinsic motivation development.

Implications

The implications of this research are numerous especially among individuals over 65 and of non-Hispanic Whites. This theoretical framework needs to be applied to other groups, such as AAs, who have a high prevalence of chronic disease and the lowest reported levels of physical activity engagement compared to other racial/ethnic groups. Understanding the exercise behaviors of AAs with a theoretical framework that takes into account how people identify themselves, such as SDT, could be very beneficial in developing interventions that will promote regular exercise engagement. Roberts, Cash, Feingold, and Johnson (2006) reviewed literature on the differences between Black and White females body dissatisfaction. They found that Black women were less dissatisfied with the body image compared to White women. Yet, AAw have some of the highest rates of obesity (CDC, 2015). For black women, there may be a possible disconnect between the cultural accepted positive body image associated with obesity that overrides the negative cardiovascular, metabolic diseases it is known to cause. Hence, exercise or PA as source of weight management may not be culturally relevant for some obese or overweight AAw (Agarwal, 2012; Chithambo & Huey, 2013; Heble & Heatheron, 1998). With the rise in the number of baby boomers who have chronic diseases, exercise motivation interventions could be

helpful in using regular exercise as disease management strategy. Regular exercise helps delay disability, prolongs independent living among this population, improves mood, and is beneficial in decreasing fall risk. The fall risks among community-dwelling elderly individuals are high and could lead to long-term disability and death (Tinetti, 2003).

Among elderly individuals, studies have suggested several barriers to exercise. Some of the barriers mentioned in the literature were unsafe neighborhoods, physician recommendation, pain, lack of confidence/self-efficacy, lack of physical activity experience as a child, and lack of social support (Phillips, Schneider, & Mercer, 2004). As a normal part of the aging process, individuals develop arthritis and gain weight. These two factors together can exacerbate pain with mobility. However, with the appropriate knowledge and access, elderly individuals could take advantage of other modalities (e.g. water) that could help eliminate the pain induced by weight bearing. Additionally, professionals who used autonomy supportive strategies such as providing rationales with choices of activities, rationale for behavior change, and the acknowledgment of the patient perspective regarding PA will empower the individual. This increase in autonomy could translate into increased control, increased exercise participation, and better health outcomes among the elderly.

References

- Agarwal, S. K. (2012). Obesity in African Americans: Perceptions and Realities. *International Journal of Biological & Medical Research*, 3, 1820-1823.
- Airhihenbuwa, C. O., Kumanyika, S., Agurs, T. D., & Lowe, A. (1995). Perceptions and beliefs about exercise, rest, and health among African Americans. *American Journal of Health Promotion*, 9(6), 426-429.
- Angelelli, J., Grabowski, D. C., & Mor, V. (2006). Effect of educational level and minority status on nursing home choice after hospital discharge. *American Journal of Public Health*, 96(7), 1249-1253.
- Ball, M. M., Perkins, M. M., Whittington, F. J., Hollingsworth, C., King, S. V., & Combs, B. L. (2004). Independence in assisted living. *Journal of Aging Studies*, 18, 467-483.
- Ball, M. M., Whittington, F., Perkins, M., Patterson, V., Hollingsworth, C., King, S. & Combs, B. (2000). Quality of life of assisted living residents: Viewpoints of residents. *Journal of Applied Gerontology*, 19, 304-325.
- Brunet, J. & Sabiston, C. M. (2011). Exploring motivation for physical activity across the adult lifespan. *Psychology of Sport and Exercise*, 12(2), 99-105.
- Centers of Disease Control and Prevention, National Center for Health Statistics. (2015). *Health of Black or African American non-Hispanic population*. Retrieved from <http://www.cdc.gov/nchs/fastats/black-health.htm>
- Chan, D. K., Hagger, M. S., Spray, C. M. (2011). Treatment motivation for rehabilitation after a sport injury: Application for the trans-contextual model. *Psychology of Sport & Exercise*, 12(2), 83-92.

- Chatzisarantis, N. L. D., & Hagger, M. S. (2009). Effects of and intervention based on self-definition theory on self-reported leisure-time physical activity participation. *Psychology & Health, 24*(1), 29-48.
- Chithambo, T. P. & Huey, S. J. (2013). Black/White differences in perceived weight and attractiveness among overweight women. *Journal of Obesity, 1-4*.
- Dacey, M., Baltzell, A., & Zaichkowsky, L. (2008). Older adults' intrinsic and extrinsic motivation toward physical activity. *American Journal of Health Behavior, 32*(6), 570-582.
- Dacey, M., & Newcomer, R. (2005). A client-centered counseling approach to motivating older adults towards physical activity. *Topics in Geriatric Rehabilitation, 21*(3), 195-204.
- deCharms, R. (1968). *Personal causation*. New York: Academic Press.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating Internalization: The self-determination theory perspective. *Journal of Personality, 62*(1), 120-140.
- Deci, E. L. & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.
- Edmunds, J., Ntoumanis, N., & Duda, J. L. (2006). A test of self-determination theory in the exercise domain. *Journal of Applied Social Psychology, 36*(9), 2240-2265.
- Ferrand, C., Martinent, G., & Bonnefoy, M. (2014). Exploring motivation for exercise and its relationship with health-related quality of life in adults aged 70 years and older. *Ageing & Society, 34*(3), 411-427.
- Ferrand, C., Nasarre, S., Hautier, C. & Bonnefoy, M. (2012). Aging and well-being in French older adults' regularly practicing physical activity: A self-determination perspective. *Journal of Aging and Physical Activity, 20*(2), 215-230.

- Fiscella, K., Meldrum, S., Franks, P., Shields, C. G., Duberstein, P., McDonald, S. H., & Epstein, R. M. (2004). Patient trust: Is it related to patient-centered behaviors of primary care physicians? *Medical Care*, 42, 1049-1055.
- Fortier, M. S., Duda, J. L., Guerin, E., & Teixeira, P. J. (2012). Promoting physical activity: Development and testing of self-determination theory-based interventions. *International Journal of Behavioral Nutrition and Physical Activity*, 9, 1-14.
- Fortier, M. S., Sweet, S. N., O'Sullivan, T. L., & Williams, G. C. (2007). A self-determination process model of physical activity adoption in the context of a randomized controlled trial. *Psychology of Sport and Exercise*, 8, 741-757.
- Grabowski, D. C. & McGuire, T. G. (2009). Black-white disparities in care in nursing homes. *Atlantic Economic Journal*, 37(3), 299-314.
- Gunnell, K. E., Crocker, P. R. E., Wilson, P. M., & Mack, D. E. (2013). Psychological need satisfaction and thwarting: A test of basic psychological needs theory in physical activity contexts. *Psychology of Sport and Exercise*, 14(3), 599-607.
- Hackett, M. L., Yapa, C., Parog, V, & Anderson, C. S. (2005). Frequency of depression after stroke: A systematic review of observational studies. *Stroke*, 36(6), 1330-1340.
- Hagger, M. S., Chatzisarantis, N. L. D., Barkoukis, V., Wang, C. K. J., & Baranowski, J. (2005). Perceived autonomy support in the physical education and leisure-time physical activity: A cross-cultural evaluation of the trans-contextual model. *Journal of Educational Psychology*, 97(3), 376-390.
- Hagger, M. S., Chatzisarantis, N. L. D., Culverhouse, T., & Biddle, S. J. H. (2003) The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior: A trans-contextual model.

Journal of Educational Psychology, 95(4),784-795.

Haskell, W. L., Lee, I., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A. ...Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults for the American College of Sports Medicine and American Heart Association. *Circulation*, 9, 1081-1093.

Haupt, M. T., Bekes, C. E., Brill, R. J., Carl, L. C., Gray, A. W., Jastremski, M. S., Naylor, D. F., Rudis, M., Spevetz, A., Wedel, S. K., & Horst, M. (2003). Guidelines on critical care services and personnel recommendations based on a system of categorization of three levels of care. *Critical Care Medicine*, 31(11), 2766-2683.

Hays, L. M., Damush, T. M., & Clark, D. O. (2005). Relationships between exercise self-definition and exercise participation among urban women in primary care. *Journal of Cardiovascular Nursing*, 20(1), 9-17.

Hays, L. M., Pressler, S. J., Damush, T. M., Rawl, S. M., & Clark, D. O. (2010). Exercise adoption among older, low income women at risk for cardiovascular disease. *Public Health Nursing*, 27(1), 79-88.

Hebl, M. R. & Heatherton, T. F. (1998). The stigma of obesity in women: The difference is black and white. *Personality and Social Psychology Bulletin*, 24(4), 417-426.

Hill, A., Hoffman, T., McPhail, S., Beer, C., Hill, K. D., Brauer, S. G., & Haines, T. P. (2011). Factors associated with older patients' engagement in exercise after hospital discharge. *Archives' of Physical Medicine and Rehabilitation*, 92(9), 1395-1403.

Howard, D. L., Slone, P. D., Zimmerman, S., Eckert, J. K., Walsh, J. F., Buie, V.C., Taylor, J. P. & Koch, G. G. (2002). Distribution of African Americans in residential

- care/assisted living and nursing homes: More evidence of racial disparity.
American Journal of Public Health, 92(8), 1272-1277.
- Hunt, M. R. & Ells, C. (2011). Partners toward autonomy: Risky choices and relational autonomy in rehabilitation care. *Disability and Rehabilitation*, 33(11), 961-967.
- Institute of Medicine. (1981). *Health Care in a Context of Civil Rights*. (IOM 81-04).
Washington, DC: The National Academies Press.
- King, A.C. & King, D. K. (2010). Physical activity for an aging population. *Public Health Review*, 32 (2), 401-426.
- Kirkland, R. A., Karlin, N. J., Stellino, M. B., & Pulos, S. (2011). Basic psychological needs satisfaction, motivation, and exercise in older adults. *Activities, Adaptation, and Aging*, 35(3), 181-196.
- Konetzka, R. T. & Werner, R. M. (2009). Disparities in long-term care: Building equity into market-based reforms. *Medical Care Research and Review*, 66(5), 491-521.
- Levy, A. R., Polman, R. C. J., & Borkoles, E. (2008). Examining the relationship between perceived autonomy support and age in the context of rehabilitation adherence in sport. *Rehabilitation Psychology*, 53(2), 224-230.
- Markland, D. & Tobin, V. J. (2010). Need support and behavioral regulations for exercise among referral scheme clients: The mediation role of psychological needs satisfaction. *Psychology of Sport & Exercise*, 11(2), 91-99.
- Moos, R. H. (1981). Environmental choice and control in the community care setting of older people. *Journal of Applied Social Psychology*, 11(1), 23-43
- Nies, M. A., Troutman-Jordan, M., Branche, D., Moore-Harrison, T., & Hohensee, C. (2013)
Physical activity preference for low-income sedentary urban African American older

- adults. *Journal of Gerontological Nursing*, 39, 20-29.
- O’Conner, B. P. & Vallerand, R. J. (1994). Motivation, self-determination, and person-environment fit as predictors of psychological adjustment among nursing home residents. *Psychology and Aging*, 9(2), 189-194.
- O’Sullivan, S. B. (2014). Strategies to improve motor function, In O’Sullivan, S. B., Schmitz, T. J., & Fulk, G. (Eds 5th). *Physical Rehabilitation*, 72-88. Philadelphia, PA: FADavis.
- Pampel, F. C., Krueger, P. M. & Denney, J. T. (2010). Socioeconomic disparities in health Behaviors. *Annual Review of Sociology*, 36, 349-370.
- Peri, K., Kerse, N., Robinson, E., Parsons, M., Parsons, J. & Lathan, N. (2008). Does functionally based activity make a difference to health status and mobility? A randomized controlled trial in residential care facilities (The Promoting Independent Living Study, PILS). *Age and Aging*, 37, 57-63.
- Philippe, F. L. & Vallerand, R. J. (2008). Actual environments do affect motivation and psychological adjustment: A test of self-determination theory. *Motivation and Emotion*, 32, 81-89.
- Phillips, L. J. & Flesner, M. (2013). Perspectives and experiences related to physical activity of elders in long-term-care settings. *Journal of Aging and Physical Activity*, 21(1), 33-50.
- Phillips, E. M., Schneider, J. C., & Mercer, G. R., (2004). Motivating elders to initiate and maintain exercise. *Archives of Physical Medicine and Rehabilitation*, 85(7), 52-57.
- Proot, I. M., Meulen, R. H., Abu-Saad, H. H., & Crebolder, H. F. J. M. (2007). Supporting stroke patients’ autonomy during rehabilitation. *Nursing Ethics*, 14(2), 220-241.

- Riedl, M., Mantovan, F. & Them, C. (2013). Being a nursing home resident: A challenge to one's identity. *Nursing Research and Practice*, 2013, 1-9.
- Roberts, A., Cash, T. F., Feingold, A., & Johnson, B. T. (2006). Are black-white differences in female body dissatisfaction decreasing? A meta-analytic review. *Journal of Consulting & Clinical Psychology*, 74(6), 1121-1131.
- Rouse, P. C., Ntoumanis, N., Dud, J. L., Jolly, K. & Williams, G. C. (2011). In the beginning: Role of autonomy support on the motivation, mental health and intentions of participants entering an exercise referral scheme. *Psychology and Health*, 26(6), 729-749.
- Russell, K. L. & Bray, S. R. (2010). Promoting self-determined motivation for exercises in cardiac rehabilitation: Role of autonomy support. *Rehabilitation Psychology*, 55(1), 74-80.
- Ruuskanen, J. & Parkatti, T. (1994). Physical activity and related factors among nursing home residents. *Journal of American Geriatric Society*, 42(9), 987-991.
- Ryan, R. M. & Deci, E. L. (2000). Self-determination theory and facilities of intrinsic motivation social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behavior change and its maintenance: Interventions based on self-determination theory. *The European Health Psychologist*, 10, 2-5.
- Schussler, S., Dassen, T., & Lohmann, C. (2014). Care dependency and nursing care problems in nursing home residents with and without dementia: A cross-sectional study. *Aging Clinical & Experimental Research*, 28(5), 973-982.
- Sebire, S. J., Standage, M., & Vansteenkiste, M. (2009). Examining intrinsic versus extrinsic

- exercise goals: Cognitive, affective, and behavioral outcomes. *Journal of Sport & Exercise Psychology*, 31(2), 189-210.
- Smith, D. B., Feng, Z., Fennell, M. L., Zinn, J., & Mor, V. (2008). Racial disparities in access to long-term care: The illusive pursuit of equality. *Journal of Health Politics, Policy and Law*, 33(5), 862-881
- Solberg, P. A., Halvari, H., & Ommundsen, Y. (2013). Linking exercise and causality orientations to change in well-being among older adults: Does the change in motivational variable play a role? *Journal of Applied Social Psychology*, 43(6), 1259-1272.
- Springer, J. B., Lamborn, S. D., & Pollard, D. M. (2013). Maintaining physical activity overtime: The importance of basic psychological need satisfaction in developing the physically active self. *American Journal of Health Promotion*, 27(5), 284-293.
- Thogersen-Ntoumani, C. & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions, and physical self-evaluations. *Journal of Sports Sciences*, 24(4), 393-404.
- Timko, C. & Moos, R. H. (1989). Choice, control, and adaptation among elderly residents of sheltered care settings. *Journal of Applied Social Psychology*, 19(8), 636-655.
- Tinetti, M. E. (2003). Preventing falls in elderly persons. *The New England Journal of Medicine*, 348, 42-49.
- Tribess, S., Virtuoso Junior, J. S., & de Oliveria, R. J. (2012). Physical activity as a predictor of absence of frailty in the elderly. *Revista De Associon Medical Brasileira*, 58(3), 341-347.
- Vallerand, R. J (1997). Toward a hierarchical model of intrinsic and extrinsic motivation.

- Advances in Experimental Social Psychology*, 29, 271-360.
- Vallerand, R. J. (2000). Deci & Ryan's self-determination theory: A view from a hierarchical model of intrinsic and extrinsic motivation. *Psychological Inquiry*, 11(4), 312-318.
- Vlachopoulos, S. P., Letsiou, M., Palaiologou, A., Leptokaridou, E. T., & Gigoudi, M. A. (2010). Assessing multidimensional exercise amotivation among adults and older individuals: The amotivation toward exercise scale-2. *European Journal of Psychological Assessment*, 26, 248-255.
- Wallace, K. A. & Lahti, E. (2005). Motivation in later life: A psychosocial perspective. *Topics in Geriatric Rehabilitation*, 95-106.
- Walsh, K. M. & Waldmann, T. (2008). The influence of nursing home residences on capacities of low-dependency older adults. *Aging and Mental Health*, 12(5), 528-535.
- Weman-Josefsson, K., Lindwall, M., & Ivarsson, A. (2015). Need satisfaction, motivational Regulations and exercise: moderation and mediation effects, *International Journal of Behavioral Nutrition and Physical Activity*, 12(67), 1-11.
- Wolk, S. (1976). Situational constraint as a moderator of the locus of control-adjustment relationship. *Journal of Consulting & Clinical Psychology*, 44(3), 420-427.

Chapter 3

THE RELATIONSHIP BETWEEN SELF-DETERMINATION THEORY AND PHYSICAL ACTIVITY PARTICIPATION VARIABLES TO EXERCISE SELF-DEFINITION AMONG AFRICAN-AMERICAN RETIREES

African Americans are the least physically active racial/ethnic group in America (Go et al, 2013). Non- Hispanic African Americans are more likely to be inactive (41.1%) than non – Hispanic white adults (27.7%) (Go et al., 2013; Sebastiao, Ibe-Lamberts, Bobitt, Schwingel, & Chodzko-Zajko , 2015). In addition to being a physically inactive group, the healthcare costs of older adults (65 and older) represent the highest proportion of overall medical care costs in America (Nelson et al., 2007). Only 21% of adults met the 2008 federal PA guidelines for both aerobic and strengthening activity (Go et al., 2013). Hence, an individual who is African American, female, over the age of 65 with less than a high school education, and low SES is at high risk for being physically inactive (Geyen, 2012; Pampel, Kreuger, & Denny, 2012).

Chronic diseases are disproportionately higher among African Americans compared to other ethnic groups (Cooper et al, 2000). The prevalence of chronic diseases such as obesity, diabetes, hypertension, and hypercholesterolemia among African Americans have all been positively linked to a lack of regular physical activity participation (Geyen, 2012). The American College of Sport Medicine (ACSM) and Centers of Disease Control and Preventions (CDC) suggest that individuals experience moderate levels of physical activity for 30 minutes a day/ 150 minutes of week with at least 10 min intervals of intensity (USDHHS, 2008).

Currently, younger African Americans are not meeting the recommended physical activity (PA) guidelines and likely PA participation among older African Americans is less (Geyen, 2012). Some of the benefits for older adults participating in regular PA include improved bal-

ance, flexibility, strengthening and aerobic conditioning (Nelson et al., 2007). These physical improvements have been linked to an improved quality of life (Rejeski & Mihalko, 2001).

African Americans and Physical Activity

Many of the chronic diseases such as diabetes and hypertension within the African American community could be managed with regular physical activity (Geyen, 2012; Wanko et al., 2004). Among African American women (AAw), physical activity (PA) engagement has been particularly low historically for several reasons (CDC, 2011; Joseph, Ainsworth, Keller, & Dodgson, 2015). Some studies have suggested that AAw tend to be more satisfied with a larger body size than white women (Chithambo & Huey, 2013; Hebl & Heatherton, 1998; Thompson, Sargent, & Kemper, 1996). Another study even suggested that professional AAw did not exercise on their lunch break due to not wanting to use public showers or deal with post exercise hair management concerns (Joseph et al., 2015).

Airhihenbuwa, Kumanyika, Agurs, and Lowe (1995) interviewed African American men (AAM) and AAw ranging from ages 13 to over 65 years of age to understand their perceptions and beliefs about exercise. Their study found that African Americans believed rest was more important than exercise and believed it is a prerequisite for exercise. African Americans also believed that their “work” or “ADLs” were a form of exercise. This thought was particularly pervasive among older AAM who worked physical labor jobs as a result of their limited education. Additionally, older AAM stated they did not participate in exercise for health reasons (e.g. heart problems) or because they felt that they deserved to be sedentary after working a manual labor job (Airhihenbuwa et al., 1995). For younger AAM, Airhihenbuwa and colleagues (1995) reported that they exercised for reasons such as they valued nice bodies to attract women since they have few material resources and to protect themselves in their neighborhoods. According to

the study, African Americans friends influenced exercise behavior more than family. African Americans preferred not to pay for classes related to exercise and preferred “group” exercise activities (e.g. men prefer basketball or dancing at social events) versus individual activities such as jogging (Airhihenbuwa et al., 1995; Lavizzo-Mourey et al., 2001) .

Lavizzo-Mourey et al. (2001) interviewed older African Americans about their exercise beliefs living in an urban community. Participants in the study included individuals who resided in nursing homes, day programs, senior center, a local church, and social club. Each individual had varying levels of mobility and independence. For those older individuals with physical impairments, they felt that activities such as negotiating stairs, household chores, or any activity producing fatigue were examples of “exercise.” However, the more physically capable seniors stated that biking, using exercise equipment and calisthenics were considered “exercises.” Yet, many of the individuals in the physically capable group stated they rarely exercised. The less physically capable group reported they felt their wheelchair confinement, walkers, or painful limbs and back limited their ability to exercise. The more physically capable group had more concerns about overexertion, falls, and fear of falling as barriers to participating in exercise. Regarding external barriers to exercise, many stated neighborhood safety was a concern when considering walking as an exercise modality.

Exercise Identity and Physical Activity

According to Stets and Burke (2000), identity theory involves the classification of the self as an occupant of a role in addition to assimilating that role into the self. As a result, the individual is able to vary the value they associate with each role. Hence, the study of exercise identity (i.e. exercise self-definition) may be important to understand exercise behavior based the relative value the individual places on their role as an exerciser. Two studies examined this construct on

exercise self-definition among older (mean age 64 years) AAw (Hays, Damush, & Clark 2005; Hays, Pressler, Damush, Rawl, & Clark, 2010). One study found that “value of exercise” (a subscale of exercise self-definition) predicted exercise adherence to an exercise program among older AAw (Hays et al, 2010). The other study found that AAw exercise self-definition scores strengthened over a 6-month period (Hays et al, 2005). The construct of exercise identity has not been fully explored among the African-American population and may provide key information on how to improve exercise participation and adherence within this population.

Vlachopoulos, Kaperoni, and Moustaka (2011) investigated the relationship between self-determination constructs and exercise identity among private fitness center members (N = 733) whose ages ranged from 18-64 years in northern Greece. A Pearson correlation matrix was used to determine relationships between the two “factors” of the exercise identity scale (i.e. exercise role identity and exercise belief), autonomy, relatedness, competence, and autonomy support. Additionally, the study included the five behavioral regulation typologies: amotivation, external regulation, introjected regulation, identified regulation, and intrinsic motivations (Vlachopoulos et al., 2011). The study reported that the regulations that reflected more internalization (e.g. intrinsic and identified regulation) were more strongly associated with exercise role identity as well as the psychological need of competence (Vlachopoulos, Kaperoni, & Moustaka., 2011). Exercise beliefs were significantly associated with the behavioral regulations of introjected and identified regulations, intrinsic motivation, and psychological need of competence. However, studies investigating exercise identity and self-determination motivation theory among African Americans do not currently exist in the literature.

Exercise motivation and physical activity

Self-determination theory (SDT) of motivation addresses the importance of identity in the development of intrinsic motivation. According to SDT, in order for an individual to become self-determined (i.e. intrinsically motivated or identified regulated) all three of their psychological needs (i.e. autonomy, competence, and relatedness) must be fulfilled. Self-determination theory sub-theory (i.e. organismic integration theory) proposes that motivation is the result of fulfilling varying levels of psychological needs. This variation can be conceptualized along a continuum comprised of five typologies: amotivation, external regulation, introjected regulation, identified regulation, and intrinsic motivation (i.e. regulations) (Ryan & Deci, 2000). Within the context of exercise, amotivation is defined as an apathetic, unintentional drive or commitment toward exercise or physical activity. Additionally, the individuals' psychological needs are unfulfilled.

The external regulation, introjected regulation, and identified regulations are all examples of extrinsic motivation. Individuals who possess an external regulation and introjected regulation typology have unfulfilled psychological needs and their motives to engage in physical activity are external to them (e.g. money, praise) (Ryan & Deci, 2000). However, individuals with identified and intrinsic typologies tend to have an innate drive to participate in physical activity due to having more of their psychological needs fulfilled (Thogersen-Ntoumani & Ntoumanis, 2004). Individuals with these regulations are more likely to assimilate the new behavior (e.g. exercise or physical activity) into the self and experience more autonomy with the new activity (Ryan & Deci, 2000). A study conducted by Strachan, Frotier, Perras, and Lugg (2012) reported that exercise identity (i.e. self-definition) was most correlated with the self-determined regulations (e.g. intrinsic and identified) than the non-self-determined regulations among a majority sample of

college-aged women. Yet once again, studies examining these constructs and relationships among African American are sparse.

Purpose of Study and Hypotheses

The overall aim of this study is to investigate the exercise behaviors of African-American retirees. The nation's 65 and older population (i.e. baby boomers) will increase to 53 million by 2010 and many of these individuals will also have chronic diseases (Bodenheimer, Lorig, Holman, & Grumbach, 2002). This population was chosen because older African Americans are less likely to engage in physical activity compared to younger African Americans due to the presence of chronic diseases. These chronic diseases become a burden to the health care system and can become debilitating for the individuals (Durstine, Gordon, Wang, & Luo, 2013). One lifestyle shift that has been associated with this prevalence in chronic diseases is physical inactivity (Durstine et al., 2013). Therefore, an investigation into the relationships between motivational and psychological constructs (e.g. self-definition and self-determination) is needed to understand the lack of physical activity engagement among African-American retirees.

The first aim of this study was to examine the pattern of associations between self-determination theory (SDT) variables, physical activity participation, and exercise self-definition (ESD). Second, to determine how much of physical activity participation can be explained by exercise self-definition and SDT variables.

Exercise self-definition is based upon an identity theory that proposes individuals who value exercise, receive strong social acknowledgment for exercise, and view them as competent exercisers are more likely to engage in exercise regularly and adopt a positive "role" for exercise within the self. SDT proposed that individuals who have their psychological needs of competence, relatedness, and autonomy fulfilled are more likely to engage in an activity for intrinsic

reasons. These individuals with fulfilled psychological needs have self-determined behavioral regulations (identified and intrinsic) and assimilate the role into the self. It appears that SDT constructs and exercise self-definition are likely to be related to one another and both can influence identity development within the context of exercise. Therefore, further understanding of the empirical association of these variables is needed.

The first research hypothesis states that BREQ2RAI (Behavioral Regulations Exercise Questionnaire-2/Relative Autonomy Index) will be positively and significantly associated with ESD (exercise self-definition) and physical activity participation (GLTEQ). The participants in this study lived in independent living facilities where autonomy, competence and relatedness were supported. Thus, their environment is more likely to support self-determined motivations such as identified regulation and intrinsic motivation. These motivation typologies facilitate the integration of the exercise behaviors into the individual's schema. Therefore, the majority of individuals will likely report strong overall ESD (i.e. exercise self-definition) scores.

The second research hypothesis states that exercise self-definition (ESD) scores will be positively and significantly associated with all three psychological needs: autonomy, competence, and relatedness. Since the majority of participants live in independent, autonomous supportive environments, these individuals are more likely to have their psychological needs fulfilled compared to those residents living in the dependent living setting. Psychological needs fulfillment and positive identity assimilation are prerequisites for identity integration (Ryan and Deci, 2000). According to Ryan and Deci (2000), the fulfillment of psychological needs (i.e. relatedness, autonomy, and competence) is necessary for the integration and internalization of extrinsically motivated behaviors. The primary reason people perform behaviors is that these behaviors are observed, modeled, or supported by important others to whom we want to be con-

nected with. This point highlights the role of relatedness in assimilating new behaviors into the self. Subsequently, individuals will gain competence once they begin to perform, practice, and then own these behaviors. Lastly, autonomy is primary to becoming self-determined and facilitated or thwarted based on social context. An autonomy supportive environment endorses competence, relatedness and autonomy and leads to identity integration (Ryan & Deci, 2000).

The last research hypothesis states that the BREQ2 RAI (behavioral regulations index), all three psychological needs, and exercise self-definition (ESD) will be significant predictors of physical activity participation (GLTEQ). Hay et al (2005, 2010) found that as AAW increased their exercise participation, their exercise self-definition improved. The psychological need of competence is a major predictor of physical activity participation among a majority white sample of college students (Martinez, Oberle, & Nagurney, 2013). Teixeira et al., 2013 stated that individuals with more autonomous forms of motivation are likely to participate in exercise.

Methodology

Upon receiving approval for a research protocol from the university institutional review board and a hospital research oversight committee, one hundred and eighty-six (N= 151) African-American men and women 60 years of age or older volunteered to participate in the study. All the residents reported living independently. The recruitment for participants included using flyers and word of-mouth-notification. The researcher attended a national convention, local retirement communities, fitness centers, and performed phone interviews with family and relatives in an effort to recruit participants for the study. As an incentive, a raffle for commercial gift cards was conducted to encourage participation by residents. To be included in the study, the individuals had to be over 60 years of age and identify as African America. Individuals who reported living in an independent living setting (e.g. retirement community or on their own home)

were not required to complete the cognitive assessment. The data was collected over a 6-month period.

Participants completed a demographic questionnaire to collect information on age/date of birth, race, gender, years of education, monthly income, marital status, and health ailments (e.g. disease or diagnosis). According to G-Power statistical application, a sample size of approximately N=151 is sufficient for a regression analysis up to 5 predictors. Each participant was given a questionnaire packet that contained an informed consent, a demographic data form, the Exercise Self-Definition Scale (ESD), Basic Psychological Needs for Exercise Scale (BPNES), Godin Leisure-Time Exercise Questionnaire (GLTEQ) and the Behavioral Regulations Exercise Questionnaire -2 (BREQ-2) scales.

Measures

Behavior Regulation Exercise Questionnaire.

The Behavior Regulation Exercise Questionnaire (BREQ-2) is a 19-item, four-point continuous questionnaire investigating why people decide to engage or not to engage in exercise. The questionnaire is made of up five subscales based on the orgasmic integration sub-theory of self-determination theory. The subscales are amotivation (4 statements), external regulation (4 statements), introjected regulation (3 statements), identified regulation (3 statements), and intrinsic motivation (4 statements). The responses are a 5-point scale ranging from “0- not true for me” to “4- very true for me”. An example of a question from this scale is “I enjoy exercise because other people say I should.” The scale is an interval scale and reveals a nominal motivation typology based on responses. Regarding psychometric properties, Cronbach’s alpha scores on each of the 5 subscales of the BREQ-2 ranged for 0.73-0.86 (Markland & Tobin, 2004). The construct validity as demonstrated by confirmatory factor analysis provided support for the 5-

factor model based on a favorable Satorra-Bentler $\chi^2 = 136.49$, $p=.23$ (Markland & Tobin, 2004). The relative autonomy index (BREQ2RAI) was calculated and used in the analysis as a composite representation of BREQ-2 as a ratio level of measurement. Higher RAI mean scores are indicative of higher levels of autonomy (Chemolli & Gagne, 2014; Ryan & Connell, 1989).

Exercise Self-Definition Scale.

Exercise self-definition scale (ESD) is an 11-item, continuous scale used to assess the individuals' perception of him or herself as an exerciser. The scale is constructed on three subscales: perceived value of exercise (4 statements), perceived acknowledgment (4 statements), and perceived competence (3 statements). The responses for each item is on an 11-point scale ranging from "0- not at all" to "10- very much" for all items. The following is an example question from the questionnaire: "To what extent do you consider yourself an exerciser?" With regards to psychometric properties, Cronbach alpha coefficients for each sub-scale and the overall scale were all 0.72 or greater (Hays et al., 2010). Using principal component analysis, construct validity was confirmed for the three factors (i.e. value of exercise, perceived acknowledgment). Among young adults, individuals who defined themselves as "exercisers" exercised more frequently (Estabrooks & Courneya, 1997; Kendzierski, 1988; Yin & Boyd, 2000), followed through after initiating an exercise program (Estabrooks & Courneya, 1997). They also used more strategies to help them exercise regularly (Kendzierski, 1988) and reported higher expectations to exercise in the future (Yin & Boyd, 2000) than those who do not define themselves as exercisers. Scores range from 0 to 110, where higher mean scores are indicative of a stronger, positive exercise self-definition (i.e. identity).

Godin Leisure-Time Exercise Questionnaire

Godin leisure-time exercise questionnaire (GLTEQ) is a brief, four-item, continuous self-report inquiry of usual leisure-time exercise habits over a seven-day period. The scale was developed by Drs. G. Godin and J. Shepherd of Canada in 1985. The numerical values range from zero to any value up to or greater than one hundred. The GLTEQ has demonstrated good test-retest reliability as evidenced by correlation coefficients for the following exercise intensity levels on the scales over a two-week period: Light= 0.48, Moderate= 0.46, Strenuous= 0.94 and total=0.74 (Godin & Shepherd, 1985). Evidence for discriminant validity for GLTEQ was demonstrated by categorizing 69% of participants based on VO2 max patients and 66% based on body fat (Godin & Shepherd, 1985). A sample question from the scale: "Considering a seven day period, during your leisure time, how often do you engage in any regular activity long enough to work up a sweat (make heart beat rapidly)?" The responses are often/sometimes/never-rarely. The scores range from less than 14 units (insufficiently active/sedentary), between 14-23 units (moderately active), and 24 units or more (active) (Godin, 2011). Higher mean scores are indicative of more physical activity engagement.

Psychological Need Satisfaction in Exercise Scale

Psychological Need Satisfaction in Exercise Scale (PNSES) is a 12-item, continuous self-report scale created by Vlachopoulos and Michailidou (2006). It was designed to assess the perceptions of the extent to which the three basic psychological needs of autonomy, competence, and related are met in relation to exercise based on the self-determination theory. Therefore, the scale consists of three, four item sub-scales. The item response format is a 5-point Likert-scale ranging from "1- totally disagree" to "5- very strongly agree." The total scores can range from 12 to 60 points; higher total scores are suggestive of greater perceived needs satisfaction. The fol-

lowing is a sample statement from the scale: “I feel very strongly that the way I exercise fits perfectly the way I prefer to exercise.” With regard to psychometric properties, Cronbach alpha coefficients were 0.75, 0.80, and 0.86 for autonomy, competence, and relatedness subscales respectively (Vlachopoulos, Ntomanis, & Smith, 2010). Using confirmatory factor analysis, all factor loadings were moderate (median=.749) suggesting good construct validity. Confirmatory factor analysis provided adequate discriminant validity between factors: autonomy and competence $r = 0.86$ (95% CI=.08-.92); autonomy and relatedness $r = 0.69$ (95% CI= 0.61-0.77) and relatedness and competence $r = .52$ (95% CI= 0.44-0.60) (Vlachopoulos et al, 2011). There is also an 18-item version of this scale as well. These scores range from 18 to 126, where higher mean scores are indicative of fulfilled psychological needs for exercise. For this study, the 12-item scale was used.

Analytical Plan

The analysis will be conducted with a sample size of $N=151$, an alpha of 0.05 and a power of 0.8. Spearman Rho correlations coefficients will be conducted on the following variables: Godin scale (GLTEQ), BREQ2RAI, competence, autonomy, relatedness, and ESD to determine strength of variable relationships. Due to the diversity of functional mobility among participants both within and between groups, the Spearman Rho correlation is best suited to deal with outliers and the non-normal distribution among scores (Field, 2013). Using GLTEQ as the dependent variable, a hierarchical regression analyses will be conducted to determine the best predictors of physical activity participation. The independent variables entered are demographics: income, gender, education (Block 1); Psychological needs: competence, autonomy, relatedness (Block 2); BREQ2RAI (Block 3); and ESD (Block 4).

Results

The following paragraphs present a summary of the descriptive findings as well as the statistical procedures used to address each of the four hypotheses in this study.

Descriptive data

A total of one hundred and fifty one African Americans over the age of 60 years were recruited for this study. However, two participants were removed from the final data analysis after their scores on the GLTEQ were determined to be outliers. Therefore in the final analysis, One-hundred and forty nine (N=149) African Americans between the ages of 60 to 94 years (M=71.25; SD=7.08), were included in the final analysis. The years of education ranged from 3 to 21 years (M= 16.28; SD = 3.39). The total sample included 74 (49.0%) men and 75 (51.0%) women. A missing data analysis was performed on the demographic and dependent variables. There was less than 4% of the demographic data and less than 1% of the dependent variables data missing from this sample. According to Tabachnick and Fidell (2001), this small percentage (< 5%) of missing data will not likely pose a serious threat to the statistical outcomes. For the total sample, over 60% of residents reported having monthly incomes of \$3,000 or greater and a majority (38.9%) reported being married. The most frequently reported medical condition by participants was “other medical condition” at 53% (Table 3).

Table 1.

BEHAVIORAL REGULATIONS FREQUENCIES OF RESIDENTS

Behavioral regulations	Independent Living (n=149)	
	Frequency	%
Amotivation	0	0
External motivation	2	1.3
Introjected	1	1.7
Identified	52	34.4
Intrinsic	94	63.6
Total	149	100

Table 2

DEMOGRAPHICS: AGE & EDUCATION

	Independent Living (n=149)	
	M	SD
Age	71.25	7.08
Education	16.28	3.39

Table 3

**DEMOGRAPHICS: INCOME, GENDER,
MARITAL STATUS, MEDICAL ISSUES**

		Independent living (n=149) Frequency	Percentage
Gender	male	74	49%
	female	75	51%
Monthly Income	<\$,1000	6	4%
	\$1,001- \$2,999	45	30.9%
	\$3,000- \$4,999	46	30.9%
	>\$5,000	46	30.2%
Marital Status	single	32	21.5 %
	married	50	38.9 %
	divorced	37	24.8 %
	widowed	22	14.8 %
Medical Issues	Neuromuscular	7	5.4%
	Musculoskeletal	7	5.4%
	Cardiopulmonary	1	0.7%

Other Medical	79	53%
2 or more categories	34	21.5%
None	15	10.1%

Correlations between BREQ2RAI, Psychological Needs, Exercise Self-Definition and Physical Activity Participation

The first research hypothesis stated that BREQ2RAI will be positively and significantly associated with ESD and physical activity participation (GLTEQ). The results show that the correlation between BREQRAI and ESD was significant, $\rho(147) = .538, p < .01$. Additionally, the correlation between BREQ2RAI and GLTEQ was also significant and positive, $\rho(147) = .258, p < .01$. The results supported this hypothesis.

The second research hypothesis states that ESD scores will be positively and significantly associated with all three psychological needs: autonomy, competence, and relatedness. The results show that the correlation between ESD and each of the three psychological needs were positive and significant: autonomy: $\rho(147) = .494, p < .01$, competence: $\rho(147) = .595, p < .01$, and relatedness: $\rho(147) = .477, p < .01$. The results supported this hypothesis.

Table 4

CORRELATION MATRIX WITH S BREQ2, PSYCHOLOGICAL NEEDS, EXERCISE SELF-DEFINITION AND PHYSICAL ACTIVITY PARTICIPATION

Variables	1	2	3	4	5	6
1.Related	1					
2.Comp	.373**	1				
3.Auto	.389**	.436**	1			
4.ESDS	.477**	.595**	.494**	1		
5.BREQ2	.377**	.317**	.431**	.538**	1	
6.GLTEQ	.226**	.275**	.200*	.318**	.258**	1

Note: ESDS-Exercise Self-Definition, BREQ2- Behavioral regulations index, Comp – Exercise self-definition competence, Auto- Basic psychological needs Autonomy, Comp- Basic Psychological needs Competence, Related- Basic psychological needs Relatedness GLTEQ= Godin Leisure Time Exercise Questionnaire,. *correlation is significant at 0.05 level (2 tailed), ** correlation is significant at **0.01 level (2 tailed); *0.05 level (2 tailed).

The last research hypothesis states that the BREQ2RAI (behavioral regulations index), all three psychological needs, and ESD will be significant predictors of physical activity participation (GLTEQ). Based on the hierarchical liner regression, only the behavioral regulations index (BREQ2RAI) was a significant predictor of physical activity participation (GLTEQ). Step 1 revealed that income, education, and gender explained 2.4% of model and only gender was statistically significant. In Step 2, the addition of the psychological needs of autonomy, relatedness, and competence explained an additional 10.6 % of the model explaining a total variance of 13.0%. In Step 3, the addition of the BREQ2RAI explained 1.4 % of the variance, increasing the total model variance to 14.4%. Neither of the psychological variables in step 2 or 3 was statistically

significant in this model. Lastly, in Step 4, ESD added an additional 1.8 % variance to the overall model; however, it too was not a statistically significant predictor in the model. Overall, these collective predictors accounted for 16.2 % of the total model variance. However, the results did not support the hypothesis.

TABLE 5

HIERARCHICAL REGRESSION TO PREDICT PHYSICAL ACTIVITY PARTICIPATION USING TO SDT VARIABLES AND ESD.

Predictor	AdjR ²	B	SEB	β	p-values
Step 1	.024				
Income		-.540	4.85	-.012	.900
Education		-.139	1.10	-.127	.899
Gender		-17.86	7.34	-.218	.016*
Step 2	.013				
Income		-1.45	4.08	-.032	.723
Education		-.673	1.05	-.056	.522
Gender		-19.24	7.03	-.235	.007*
Rel		.589	.312	.163	.061
Comp		.731	.386	.169	.061
Auto		.704	.464	.135	.132

Step 3	.144				
Income		-1.792	4.05	-.039	.659
Education		-.865	1.05	-.072	.409
Gender		-21.05	7.05	-.257	.003*
Rel		.472	.316	.131	.138
Comp		.624	.388	.144	.110
Auto		.463	.480	.089	.337
BREQ2RAI		.294	.164	.163	.076
Step 4	.162				
Income		-2.63	4.03	-.057	.515
Education		-.941	1.03	-.079	.365
Gender		-21.63	6.98	-.264	.002*
Auto		.401	.476	.077	.401
Comp		.249	.429	.057	.562
Related		.377	.317	.104	.236
BREQ2RAI		.160	.176	.089	.365
ESD		.414	.211	.216	.052

Note: ESD- Exercise Self-Definition, BREQ2RAI= Behavioral Autonomy Index Score, Auto-Basic psychological needs Autonomy, Comp- Basic Psychological needs Competence, Rel-Basic psychological needs Relatedness GLTEQ= Godin Leisure Time Exercise Questionnaire, *p<.05

Discussion

The purpose of study was to provide additional information to the literature regarding the exercise behaviors of African Americans retirees who live independently. The purpose of this particular study was twofold. One purpose was to determine the relationships between self-determination theory variables, exercise definition, and physical activity participation. The other purpose was to investigate the contribution of exercise self-definition in predicting physical activity participation.

Correlations

Over 97% of older African American retirees in this study reported having one of two self-determined behavioral regulations: identified regulation or intrinsic motivation. The correlation between BREQ2RAI index and ESD was statistically significant. This finding suggests that self-determined behavioral regulations were indeed associated with positive exercise identities among older African Americans. Additionally, these individuals reported having high-levels of physical activity participation on the GLTEQ. This is an important finding to note since many reports suggest that African Americans, particularly older African Americans, have poor physical activity engagement habits and are likely to have poor exercise self-definitions. This study provided evidence that older African Americans indeed participate in regular physical activity and view themselves as exercisers. This positive and significant relationship between the self-determined behavioral regulations and ESD among an older African American sample is a unique finding in this study. This finding provides optimism in that the older African Americans who live in independent living settings see a positive relationship between their physical activity habits and their ability to care for themselves independently.

One of the reasons why a large majority of this sample may have reported having a self-determined behavioral regulation is that these participants were mostly well educated and had financial resources. According to prior research, individuals who have socioeconomic resources and are well educated tend to participate in physical activity more often (Rhodes et al., 1999). In this study, African Americans reported having moderate to high physical activity participation scores on the GLTEQ, at least a bachelor's degree level of education, and monthly incomes of at least \$3,000 per month. Many of them also reported participating in sport such as golf and tennis.

BREQ2RAI had a significant, but weak correlation with GLTEQ $\rho(147) = 0.258, p < .01$. GLETQ had the strongest correlation with the psychological variable of exercise self-definition (ESD), $\rho(147) = 0.318, p < .01$. This correlation may likely have been the strongest between GLTEQ & ESD due to the implicit relationship between behavior and identity proposed by identity theory. Identity theory proposed that individuals would engage in activities that they most identify with and that these identities or schemas are hierarchically organized. The African Americans in this study appeared to have overwhelmingly adopted the schemata of an "exerciser" based on the high to moderate GLTEQ scores and high percentage of self-determined behavioral regulations reported in this study. The identities of these African American retirees as exercisers are reinforced based on their understanding of maintaining their fitness in order to remain living in an independent context. Many of them reported being avid walkers, tennis players, and/or golfers as a part of their regular physical activity routines.

The correlations for the psychological needs, exercise self-definition, and behavioral regulations provided some of the stronger correlations in this study. Relatedness had moderate and statistically significant correlations with ESD, $\rho(147) = 0.477, p < .01$ and BREQ2, $\rho(147)$

=.377, $p < .01$. Relatedness has to do with the relationships or connections to people while participating in exercise. Among older African Americans in this study, the empirical relationship between the psychological need of relatedness and ESD was influenced by the social acknowledgement. Because the majority of the older African Americans in this study reported having a self-determined behavioral regulation, the psychological need of relatedness and others were fulfilled. Particularly among older African Americans, relatedness is a need that is valued since many of these seniors prefer group style instead of individual style exercise classes.

The psychological need of competence was strongly correlated to ESD, $\rho(147) = 0.595, p < .01$. This correlation was moderate as well as statistically significant. In this study, it appeared that the older African Americans felt competent in performing or engaging in physical activity. This competence among the older African Americans seemed to affect their exercise self-definitions as the correlation between ESD and competence was the highest of all correlations in the matrix. Since this sample was highly educated and had economic resources, perhaps they had been afforded positive and early experiences with exercises that may have enhanced their competence for exercise at an earlier age. There is literature that suggests that one reason why older African Americans may not engage in physical activity is due to unsuccessful past experiences. So perhaps for these older African Americans, early positive experiences may lead to a lifestyle adoption of regular physical activity participation. Research has found one of the physical activity participation barriers for African Americans was a lack of competence in exercising (Siddiqi et al., 2011). Previous studies have also provided evidence to support the importance of competence in exercise participation (Martinez et al., 2013). This study supports the importance of competence in physical activity participation among older African Americans.

Autonomy was significantly correlated with both EDS, $\rho(147) = .494, p < .01$ and BREQ2, $\rho(147) = .431, p < .01$. In this study, African Americans lived independently and made daily decisions on everything, including participating in exercises such as tennis, golf, and walking. Because these older African Americans made their own choices with regard to exercises they participated in and lived independently, the relationship between autonomy and exercise self-definition was strong. At an average age of 71.25, feeling autonomous is an important psychological need for many older adults. In this study, the positive correlation between autonomy and ESD among African Americans retirees was supported based on the percentage of participants who identified themselves as having an autonomous, self-determined behavioral regulation for physical activity participation.

Hierarchical regression to predict Physical Activity Participation using Self-Determination and Exercise Self-Definition Variables.

The final hypothesis proposed that the BREQ2RAI (behavioral regulations index), all three psychological needs, and ESD would be significant predictors of physical activity participation (GLTEQ). In this regression analysis, none of the hypothesized psychological variables was significant predictors of physical activity participation. ESD had a low, but moderate correlation with GLTEQ, $\rho(147) = .318, p < .01$. However, all of the predictors explained 16.2 % of the total model variance.

There are a few reasons why the explained variance of physical activity participation in this study was less than 17% and none of the predictors was significant. One reason is perhaps that neither of the psychological constructs in this study (i.e. ESD, BREQ2RAI) captured the essence of what predicts physical activity participation among older African Americans. Neither

the ESD nor the BREQ2RAI required the participants to report actual physical activities performed on these questionnaires. If the questionnaires assessed more functional attributes rather than cognitive attributes among these older African Americans, perhaps these variables could have accounted for more variance in predicting physical activity participation.

Neither of the psychological predictors was significant in predicting physical activity participation (GLTEQ) among African American retirees. However, these predictors explained 16.2% of the overall model variance. Within the matrix, the correlations between the predictors and the outcome measure (GLTEQ) were low to moderate suggesting that one would expect there to be minimal overlapping variance between these variables. With respect to the regression model, a lack of statistical significance among the predictors and the outcome measure is perhaps multifactorial. First, the correlations between each predictor with the outcome measure were all low, ranging from .200 -.318. Second, the intercorrelations were actually higher among the predictors (i.e. psychological variables) which means there is a good deal of overlap between the psychological predictors in predicting physical activity participation (GLTEQ). Hence, these variables are likely measuring the same things. Therefore, these variables may not be capturing any “unique” variance when entered individually. Last, perhaps the low power (i.e. low sample size) may be affecting the ability of the regression analysis to assess statistical significance among the predictors. This last statement is at least true for the statistical significance for ESD. The investigator ran another hierarchical linear regression using the total sample (i.e. N=184 with both independent and dependent groups) and ESD ($p=.003$) was a statistically significant predictor of GLTEQ. However, neither of the psychological needs nor the BREQ2RAI index was with the additional participants.

It is unclear as to why the neither of the psychological needs nor the BREQ2RAI were significant predictors of GLTEQ. In the Hays study (2005) where exercise self-definition (ESD) predicted exercise adoption, the findings revealed that although the older, low SES African American women valued exercise, the majority of them did not participate in regular exercise. In this study while most of the participants reported having self-determined behavioral regulations, perhaps their motivation to participate in physical activity may not best explained by self-determination theory. Physical activity is a way of decreasing or managing chronic diseases for African Americans as well as a way of preserving mobility. While they may value exercise, it is very likely that African Americans with low SES may not feel particularly threatened by chronic diseases due to a historical reliance on medication to manage their disease. This low SES population is also more likely to have debility issues and may view exercise as painful management option. So perhaps psychological needs fulfillment (i.e. SDT) is not what is driving the motivation for African American retirees to exercise, but a “perceive threat or lack thereof” (i.e. Health Belief Model) is the driving force or motivation to engage in exercise. Perhaps the threat of their loss of independence among high SES African American retirees and not the acquisition of disease that will indirectly lead to the loss of independence among low SES African American retirees differentiates these two groups exercise behavior. The reason for the latter group’s behavior is the belief that medications are a substitute for exercise and therefore I do not need to exercise. Additionally based on the results of this study (high SES) and the Hays study (low SES), financial resources may also be an important factor in this population’s motivation to engage in regular physical activity on an ongoing basis.

Limitations

The participants in this study consisted of an underrepresented population that culturally has a high prevalence of chronic diseases. Therefore, these findings are limited to African Americans over the age of 60 who live in independent settings. The inability to recruit an adequate number of African Americans in dependent settings such as nursing homes or assisted living proved difficult. This was largely due to the poor cognitive functioning of the residents. In the final regression analysis, multicollinearity may have played a role in the ability to predict physical activity participation.

Future Directions

In this current study, multicollinearity may have negatively affected how the regression equation accounted for the variance. While exercise self-definition was not a significant predictor of GLTEQ, it did explain additional variance in the equation. Therefore, perhaps having a larger sample size or adding additional predictors would make it a significant predictor of physical activity participation. There is also a need for a more culturally appropriate self-report physical activity instrument for older African Americans (Wolin et al., 2010). Many of the items on the Godin scale (e.g. snowboarding, cross-country skiing) were not familiar activities to these African American retirees. Therefore, it may not have adequately accounted for physical activity among this sample. In addition, studies have shown that older African Americans operationalize exercise or physical activity based on their physical abilities. Hence, a future longitudinal study investigating the perceived exertions of older African Americans while performing physical activities is needed. One research study in particular shows that there is certainly a change in how older adults physiologically experience exercise or PA as they age within the context of their health status (Lavizzo-Mourery et al., 2001). Additionally, future studies should use objective

measures for assessing physical activity among older African Americans rather than rely on recall as due to memory issues and their unreliable self-reporting.

References

- Airhihenbuwa, C. O., Kumanyika, S., Agurs, T. D., & Lowe, A. (1995). Perceptions and beliefs about exercise, rest, and health among African Americans. *American Journal of Health Promotion, 9*(6), 426-429.
- Anderson, D. F., Cychosz, C. M., & Franke, W. D. (2001). Preliminary exercise identity scale Norms for three adult samples. *Journal of Sport Behavior, 24*, 1-9
- Bodenheimer, T., Lorig, K., Holman, H., & Grumbach, K. (2002). Patient self-management of Chronic diseases in primary care. *Journal of American Medical Association, 288*, 2469-2475.
- Bopp, M., Lattimore, D., Wilcox, S., Laken, M., McClorin, L., Swinton, R., Gethers, O., & Bryant, D. (2007). Understanding physical activity participation in members of an African American church: a qualitative study. *Health Education Research, 22*(6), 815-826.
- Burnet, J., & Sabiston, C. M. (2011). Exploring motivation for physical activity across the lifespan. *Psychology of Sport and Exercise, 12*, 99-105
- Centers for Disease Control and Prevention. (2011). Physical activity for everyone: Physical activity and health. Retrieved May 23, 2011, from <http://www.cdc.gov/physicalactivity/Everyone/health/index.html>.
- Chemolli, E & Gagné, M. (2014). Evidence against the continuum structure underlying motivation measures derived for self-determination theory. *Psychological Assessment, 26*(2), 575-585.
- Chithambo, T. P. & Huey, S. J., (2013). Black/white differences in perceived weight and Attractiveness among overweight women. *Journal of Obesity, 1-4*.

- Cooper, R., Cutler, J., Desvigne-Nickens, P., Fortmann, S. P., Friedman, L., Havlik, R., ... & Thom, T. (2000). Trends and disparities in coronary heart diseases, stroke, and other cardiovascular diseases in the United States: Findings of the National Conference on cardiovascular disease prevention. *Circulation, 102*(25), 3137-3147.
- DiPietro, L. (2001). Physical activity and aging: Changes in patterns and their relationship to health and function. *Journals of Gerontology: SERIES A, 56*, 13-22.
- Durstine, J. L., Gordon, B., Wang, Z., & Luo, X. (2013). Chronic disease and the link to physical activity. *Journal of Sport and Health Sciences, 2*(1), 3-11.
- Estabrooks, P. & Courneya, K. S. (1997). Relationships among self-schema, intention, and exercise behavior. *Journal of Sport and Exercise Psychology, 19*(2), 156-168.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics, 4E*. London, UK: Sage Publications.
- Geyen, D. J. (2012). Behavioral changes for African Americans to improve health, embrace culture, and minimize disparities. *ECI Interdisciplinary Journal for Legal and Social Policy, 2*(1), 1-14.
- Godin, G. & Shephard, R. J. (1985). A simple method at assessing exercise behavior. *Canadian Journal of Applied Sport Science, 10*(3), 141-146.
- Haskell, W. L., Lee, I., Pate, R. R., & Blair, S. N. (2007). Physical activity and public health: Updated recommendations for adults from the American College of Sports Medicine and American Heart Association. *Medicine and Sciences in Sport and Exercise, 39*(8), 1423-1434.
- Hays, L. M., Damush, T. M., & Clark, D. O. (2005). Relationships between exercise self-definitions and exercise prescriptions among urban women in primary care. *Journal*

of Cardiovascular Nursing, 20(1), 9-17.

Hays, L. M., Pressler, S. J., Damush, T. M., Rawl, S. M., & Clark, D. O. (2010). Exercise adoption among older, low-income women at risk for cardiovascular disease.

Public Health Nursing, 27(1), 79-88.

Hebl, M. R., & Heatherton, T. F., (1998). The stigma of obesity in women: The difference is Black and White. *Personality and Social Psychology Bulletin, 24(4), 417-426.*

Jones, M. & Nies, M. A. (1996). The relationship of perceived benefits of and barriers to reported exercise in older African American women. *Public Health Nursing, 13,* 151-158.

Joseph, R. P., Ainsworth, B.E., Keller, C., and Dodgson, J.E. (2015). Barriers to physical activity among African American women: An integrative review of literature. *Women & Health, 679-699.*

Kendzierski, D. (1988). Self-Schemata and Exercise. *Basic and Applied Social Psychology, 9(1), 45 – 59.*

Kendzierski, D., Furr Jr., M.R., Schiavoni, J. (1998). Physical activity self-definitions: Correlates and perceived criteria. *Journal of Sports & Exercise Psychology, 20(2), 176-193.*

Kohr, R. L. & Games, P. A. (1974). Robustness of the analysis of variance, the Welch procedure and a box procedure to heterogeneous variables. *The Journal of Experimental Education, 43, 61-69.*

Lavizzo-Mourey, R., Cox, C., Strumpf, N., Edwards, W. F., Lavizzo-Mourey, R., Stinemon, M. & Grisso, J. A. (2001). Attitudes and beliefs about exercise among elderly African Americans in an urban community, *Journal of the National Medical Association, 93(12), 475-480.*

- Markland, D. & Tobin, V. (2004). A modification to the Behavioral Regulation in Exercise Questionnaire to include an assessment of amotivation. *Journal of Sport & Exercise Psychology, 26*(2), 191-196.
- Nelson, M. E., Rejeski, W. J., Blair, S. N., Duncan, P.W., Judge, J. O., King, A. C., Macera, C.A. & Castaneda-Sceppa, C. (2007). Physical activity and public health in older adults: Recommendations from American College of Sports Medicine and American Heart Association. *Medicine Journal of Science Sports & Exercise, 39*(8), 1435-45.
- Ng, J. Y. Y, Ntoumanis, N., Thogersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L. & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science, 7*(4), 325-340.
- Pampel, F. C., Krueger, P. M., & Denny, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Reviews in Sociology, 36*, 349-370.
- Prince, S.A., Adamo, K. B., Hamel, M. E., Hardt, J., Gorber, S. C., & Tremblay, M. (2008). A comparison of direct versus self-report measures of assessing physical activity in adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 5*(56), 1-24.
- Rejeski, W. J. & Mihalko, S. L. (2001). Physical activity and quality of life in older adults. *Journal of Gerontology: Series A, 56A*, 23-35.
- Resnick, B., Vogel, A., & Luisi, D. (2006). Motivating minority older adults to exercise. *Cultural Diversity and Ethnic Minority Psychology, 12*(1), 17-29.
- Rhodes, R.E., Martin, A. D., Taunton, J. E., Rhodes, E.C., Donnelly, M., & Elliot, J. (1999). Factors associated with exercise adherence among older adults: An individual perspective, *Sports Medicine, 28*(6), 397-411.

- Ryan, R. M. & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57(5), 749-761
- Ryan, R. M. & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55(1), 68-68.
- Schroeder, J. M., Nau, K. L., Osness, W. H., & Potteiger, J. A. (1998). A comparison of life satisfaction, functional ability, physical characteristics, and activity level among older adults in various living settings. *Journal of Aging and Physical Activity* 6(4), 340-349.
- Sebastiao, E., Ibe-Lamberts, Chodzko-Zajko, W. & Schwingel, A. (2015). An in-depth examination of perceptions of physical activity in regularly active and insufficiently active older African American Women: A participatory approach. *PloS One*, 10, 1-13.
- Sebastiao, E., Ibe-Lamberts, K., Bobitt, J., Schwingel, A. & Chodzko-Zajko, W. (2014). Employing a participatory research approach to explore physical activity among older African American women. *Journal of Aging Research*, 2014, 1-9.
- Siddiqi, Z., Tiro, J. A., & Shuval, K. (2011). Understanding impediments and enablers to physical activity among African American adults: A systematic review of qualitative studies. *Health Education Research*, 26, 1010-1024.
- Springer, J. B., Lamborn, S. D., & Pollard, D.M. (2014). Maintaining physical activity overtime: The importance of basic psychological need satisfaction in developing the physically active self. *American Journal of Health Promotion*, 27(5), 284-93.
- Strachan, S.M., Frotier, M.S., Perras, M.G.M., & Lugg, C. (2012). Understanding variations in exercise-identity strength through identity theory and self-determination theory.

- International Journal of Sport and Exercise Psychology*, 11(3), 273-285.
- Strachan, S. M., Brawley, L. R., Spink, K. S., & Jung, M. E. (2009). Strength of exercise identity and identity-exercise consistency: affective and cognitive relationships. *Journal of Health Psychology*, 14 (8), 1196-1206.
- Stets, J. E. & Burke, P. J. (2000). Identity theory and social identity theory. *Social Psychology Quarterly*, 63(3), 224-237.
- Tabachnick, B. G. & Fidell, L. S. (2001). *Using multivariate statistics*. Boston, MA: Pearson.
- Thogersen-Ntoumani, C. & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions, and physical self-evaluations. *Journal of Sports Sciences*, 24(4), 393-404.
- U.S. Department of Health and Human Services, Physical Activity Guidelines Advisory Committee. (2008). *Physical Activity Guidelines for Americans*. Retrieved from <http://www.health.gov/paguidelines/guidelines>.
- U.S. Department of Health and Human Services, Administration on Aging. (2009). *Aging Statistics*. Retrieved from http://www.aoa.gov/AoARoot/Aging_Statistics/index.
- Vlachopoulos, S. P., Kaperoni, M., & Moustaka, F. C. (2011). The relationship of self-determination theory variables to exercise identity. *Psychology of Sport & Exercise*, 12(3), 265-272.
- Vlachopoulos, S. P., Ntoumanis, N., & Smith, A.L. (2010). The basic psychological needs in Exercise scale: Translation and evidence for cross-cultural validity. *International Journal of Sport & Exercise Pedagogy*, 8(4), 394-412.
- Vlachopoulos, S. P. & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The basic psychological needs

- in exercise scale. *Measurement in Physical Education and Exercise Science*, 10(3), 179-201.
- Walcott-McQuigg, J. A. & Prohaska, T. R. (2001). Factors influencing participation of African American elders in exercise behavior. *Public Health Nursing*, 18(3), 194-203.
- Wanko, N.S., Brazier, C. W., Young-Rogers, D., Dunbar, V.G., Boyd, B., George, C.D., & Cook, C.B. (2004). Exercise preferences and barriers in urban African Americans with type 2 diabetes. *The Diabetes Educator*, 30(3), 502-513.
- Weman-Josefsson, K., Lindwall, M., & Ivarsson, A. (2015). Needs satisfaction, motivational regulations, and exercise: moderation and mediation effects. *International Journal of Behavioral Nutrition and Physical Activity*, 12, 1-11.
- Whaley, D. E. & Ebbeck, V. (2002). Self-schemata and exercise identity in older adults. *Journal of Aging and Physical Activity*, 10, 245-259.
- Wildman, R. W. II & McDaniel, W. F. (2014). Investigations into construct validity of the Saint Louis University Mental Status Examination: Crystallized versus fluid intelligence. *Journal of Psychology and Behavioral Science*, 2(2), 187-196.
- Wolin, K. Y., Fagin, C., Ufere, N., Tuchman, H., & Bennett, G. G. (2010). Physical activity in US Blacks: a systematic review and critical examination of self-report instruments. *International Journal of Behavioral Nutrition and Physical Activity*, 7(73), 1-7.
- Yin, Z. & Boyd, M. P. (2000). Behavioral and cognitive correlates of exercise self-schemata. *The Journal of Psychology*, 134(3), 269-282.
- Zoeller, R. F. (2009). Physical activity and fitness in African Americans: Implications for cardiovascular health. *American Journal of Lifestyle Medicine*, May/June, 188-194.

APPENDICES

Appendix A: **Godin Leisure-Time Exercise Questionnaire**

1. During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Times Per

Week

a) STRENUOUS EXERCISE (HEART BEATS RAPIDLY) _____

(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

b) MODERATE EXERCISE (NOT EXHAUSTING) _____

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

c) MILD EXERCISE (MINIMAL EFFORT) _____

(e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

2. During a typical 7-Day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

OFTEN

SOMETIMES

NEVER/RARELY

1.

2.

3.

Appendix C: **Behavioral Regulations for Exercise Questionnaire (BREQ-2)**

Age: _____ years

Sex: male female (please circle)

WHY DO YOU ENGAGE IN EXERCISE?

We are interested in the reasons underlying peoples’ decisions to engage, or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.

		Not true for me		Sometimes true for me		Very true for me	
1	I exercise because other people say I should	0	1	2	3	4	
2	I feel guilty when I don't exercise	0	1	2	3	4	
3	I value the benefits of exercise	0	1	2	3	4	
4	I exercise because it's fun	0	1	2	3	4	
5	I don't see why I should have to exercise	0	1	2	3	4	
6	I take part in exercise because my friends/family/partner say I should	0	1	2	3	4	
7	I feel ashamed when I miss an exercise session	0	1	2	3	4	
8	It's important to me to exercise regularly	0	1	2	3	4	
9	I can't see why I should bother exercising	0	1	2	3	4	
		Not true for me		Sometimes true for me		Very true for me	
10	I enjoy my exercise sessions	0	1	2	3	4	
11	I exercise because others will not be pleased with me if I don't	0	1	2	3	4	

12	I don't see the point in exercising	0	1	2	3	4
13	I feel like a failure when I haven't exercised in a while	0	1	2	3	4
14	I think it is important to make the effort to exercise regularly	0	1	2	3	4
15	I find exercise a pleasurable activity	0	1	2	3	4
16	I feel under pressure from my friends/family to exercise	0	1	2	3	4
17	I get restless if I don't exercise regularly	0	1	2	3	4
18	I get pleasure and satisfaction from participating in exercise	0	1	2	3	4
19	I think exercising is a waste of time	0	1	2	3	4

Thank you for taking part in our research

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Appendix D: **Basic Psychological Needs for Exercise Scale (BPNES)**

PNSE-Perceived Competence

Not at all true somewhat very true
1 2 3 4 5 6 7

1.I feel that I am able to complete exercises that are personally challenging

1 2 3 4 5 6 7

2.I feel confident I can do even the most challenging exercises

1 2 3 4 5 6 7

3.I feel confident in my ability to perform exercises that personally challenge me

1 2 3 4 5 6 7

4.I feel capable of completing exercises that are challenging to me

1 2 3 4 5 6 7

5.I feel like I am capable of doing even the most challenging exercises

1 2 3 4 5 6 7

6.I feel good about the way I am able to complete challenging exercises

1 2 3 4 5 6 7

PNSE-Perceived Autonomy

7. I feel free to exercise in my own way

Not at all true somewhat very true

1 2 3 4 5 6 7

8 I feel free to make my own exercise program decisions

1 2 3 4 5 6 7

9 I feel like I am in charge of my exercise program decisions

1 2 3 4 5 6 7

10. I feel like I have a say in choosing the exercises that I do

Not at all true somewhat very true
1 2 3 4 5 6 7

11. I feel free to choose which exercises I participate in

1 2 3 4 5 6 7

12. I feel like I am the one who decides what exercises I do

1 2 3 4 5 6 7

PNSE-Perceived Relatedness

13. I feel attached to my exercise companions because they accept me for who I am

Not at all true somewhat very true
1 2 3 4 5 6 7

14. I feel like I share a common bond with people who are important to me when we exercise together

1 2 3 4 5 6 7

15. I feel a sense of camaraderie with my exercise companions because we exercise for the same reasons

1 2 3 4 5 6 7

16. I feel close to my exercise companions who appreciate how difficult exercise can be

1 2 3 4 5 6 7

17. I feel connected to the people who I interact with while we exercise together

1 2 3 4 5 6 7

18. I feel like I get along well with other people who I interact with while we exercise together

1 2 3 4 5 6 7

Appendix E: **Demographic Information Form**

Participant Code

Date of birth _____

Age _____

Race African American

Gender (circle one)

Male / Female

Monthly income (circle one) \$1,000 or less per month \$1,001 <> \$2,999.00 per month

\$3000.00 -4,999.00 per month \$5000,00 per month

Marital Status (circle one) Married/Single/Divorced/Widowed

Highest level of Education completed

High School _____ grade level _____ College (#of yrs., or Associates or Bachelors)

_____ Grad degree (Ph.D., Masters, Eds.)

Primary Medical diagnosis (write-in) _____ Neuromuscular _____ Musculoskeletal

_____ Cardiopulmonary _____ Other (Diabetes, High blood pressure)

Living/ Residence setting (circle one) Nursing home/Assisted Living/Independent living