

AN INVESTIGATION OF MATERIALISTIC VALUES  
AND PHYSICAL ACTIVITY PARTICIPATION,  
LOCATION, AND EXPERIENCE

by

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A DISSERTATION

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## ABSTRACT

In spite of clear and much publicized health benefits, the majority of American adults do not participate in enough physical activity to satisfy established public health recommendations. In recent years, attention has been paid to social position and consumption as they are related to health and well-being. In light of increases in chronic disease and health risks associated with insufficient activity, as well as increased consumptive patterns associated with decreased well-being, studies aimed at understanding the confluence of these trends are essential. The purpose of this study was to gain a better understanding of how materialistic values interact with the social and physical environments to influence physical activity participation, location, and the experience of being active. The present study utilized a mixed method, cross sectional design ( $n = 487$ ). Increased materialism was associated with greater physical activity and appears to influence the selection of activity location, experience, and norms. The findings of this study suggest that this line of inquiry is timely, culturally relevant, and worthy of further investigation.

## DEDICATION

For my mom, Beverly J. Baller, you are an inspiration;  
and in loving memory of my dad, David G. Baller.

“Chase after money and security  
And your heart will never unclench.  
Care about people’s approval  
And you will be their prisoner.  
Do your work, then step back.  
The only path to serenity.”

Lao-tzu

## LIST OF ABBREVIATIONS AND SYMBOLS

<i>M</i>	Mean: the sum of a set of measurements divided by the number of measurements in the set
<i>p</i>	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
<i>r</i>	Pearson product-moment correlation coefficient
AI	Aspirations Index (Kasser & Ryan, 1996)
CWID	Campus wide I.D.
GSE	General self-efficacy
GPAQ	Global Physical Activity Questionnaire
HBM	Health belief model
IBM	Integrated behavior model
IPAQ	International Physical Activity Questionnaire
LS	Life satisfaction
MET	Metabolic equivalent
PASS	Physical activity social support
PCB	Perceived behavioral control
SEPA	Self-efficacy of physical activity
SWLS	Satisfaction With Life Scale
TPB	Theory of planned behavior

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## CONTENTS

ABSTRACT.....	ii
DEDICATION.....	iii
LIST OF ABBREVIATIONS AND SYMBOLS.....	iv
ACKNOWLEDGMENTS.....	v
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
1. INTRODUCTION.....	1
a. Purpose and Significance.....	1
b. Research Questions.....	3
c. Assumptions.....	3
d. Limitations.....	4
e. Delimitations.....	5
f. Terminology.....	5
2. LITERATURE REVIEW.....	8
a. The Application of Theory.....	9
b. Literature on Physical Activity.....	21
c. Literature on Materialism.....	44
d. The Relationship of Health Behaviors to Materialistic Values.....	57
e. The Confluence of Physical Activity and Materialism.....	58
3. METHODOLOGY.....	61

a. Approval from Institutional Review Board .....	61
b. Identifying and Sampling Participants .....	61
c. Quantitative Methods .....	62
d. Qualitative Methods .....	74
e. Research Question Assumptions .....	83
4. RESULTS .....	86
a. Introduction .....	86
b. Sample Population .....	86
c. Research Questions .....	90
5. DISCUSSION .....	135
a. Introduction .....	135
b. Sample Population .....	136
c. Theory .....	138
d. Research Questions .....	139
e. Implications .....	157
f. Limitations .....	161
g. Future Research .....	163
h. Conclusions .....	166
REFERENCES .....	168
APPENDIX A .....	187

## LIST OF TABLES

1. Summary of Survey Instruments.....	68
2. Sample Demographics.....	87
3. Student Perceived Financial Contribution to Life Expenses.....	89
4. Present and Summer Employment Status.....	90
5. Pearson Correlation Coefficients Aspiration Index and Subscales with Physical Activity and Related Variables.....	91
6. Pearson Correlation Coefficients for Physical Activity, Materialism, Sedentary Behavior, Life Satisfaction, and Self-Efficacy.....	93
7. Group Preferences for Physical Activity Location, Perceptions of Distance, and Transportation Preference.....	102
8. Pearson Correlation Coefficients for Materialism, Sedentary Behavior, Physical Activity, Self-Efficacy of Physical Activity, Social Support, and Self-Standards.....	104
9. Group Differences in the Experience of Physical Activity and General Health.....	114
10. Summary of the Confluence of Social Norms, Materialism, and Activity.....	125
11. One-Way ANOVA for Physical Activity and Barriers to Physical Activity.....	126
12. One-Way ANOVA for Materialism and Barriers to Physical Activity.....	130
13. Barriers and Facilitators of Activity and Healthy Behavior.....	134
14. Summary of Findings and Needs for Further Investigation.....	165

## LIST OF FIGURES

1. The Integrated Behavioral Model .....	19
2. The Dynamic Interaction of the Physical Environment, Social Environment, and the Manifestations of Materialism as They Appear in Physical Activity .....	60
3. Study Design Diagram.....	74
4. The Relationship of Internal Barriers to Physical Activity.....	128
5. The Relationship of Personal Barriers to Physical Activity.....	129
6. The Relationship of External Barriers to Physical Activity to Materialism .....	131

## CHAPTER 1

### INTRODUCTION

#### Purpose and Significance

In spite of clear and much publicized health benefits, the majority of American adults do not engage in enough physical activity to satisfy public health recommendations (Centers for Disease Control (CDC, 2008a). More than 50% of adults in America are not sufficiently or regularly active enough to meet recommendation levels, and one quarter of adults can be categorized as sedentary. Specifically, Alabama, Mississippi, and Louisiana are among the least active states with 41.7%, 39.6%, and 38.6%, respectively, meeting recommendations (Behavioral Risk Factor Surveillance System, 2007). Regular physical activity has many benefits, including weight control; reduction in risk factors for cardiovascular disease, type 2 diabetes, and various types of cancers; protective effects on muscular strength and bone density; and increased chances of a healthier longer life (CDC, 2008b). However, the root of health and well-being is not simply the physical aspects of health.

In recent years, some attention has been paid to social position, consumption, well-being, and health (Carlisle, Hanlon, & Hannah, 2008). The contagion of conspicuous consumption (Shukla, 2008) only furthers the progression of inequalities in society with broad implications for mental and physical health and well-being (Carlisle, Hanlon, & Hannah, 2008). Given the enormous societal pressure to consume, it might be easy for some individuals to attempt to satisfy their identity needs through materialism (Dittmar, Long, & Bond, 2007) and for many

more to be ensnared in a debt cycle that brings stress and possibly devastation to their lives (Varman & Belk, 2008), resulting in the reduction of quality of life and health.

The purpose of the study was to gain a better understanding of how materialistic values interact with the social and physical environments to influence physical activity participation, location, and the experience of being active. In order to investigate these potential relationships, a more clear understanding must be developed of how materialism was demonstrated and perceived during physical activity as well as the relative importance placed on that variable by college students.

Although this study represents a relationship that has not yet been thoroughly explored, the substantial body of literature presented in chapter 2 suggests that persons with high materialism aspirations are actually less happy, more dissatisfied with their lives, and have lower rates of mental well-being than those who are less materialistic (Burroughs & Rindfleisch, 2002). Although an ever-growing and substantiated body of literature regarding materialism and its relationship with psychosocial well-being exists, relatively little is understood about how those two variables interact within the bigger context of life values (Burroughs & Rindfleisch, 2002) and sociocultural determinants of health (Eckersley, 2001). Specifically, little is understood about the impact of materialism as it relates to physical health and participation in physical activity.

In order to address the aforementioned lack of depth in understanding of these variables, a multilevel approach that was both relational and descriptive was undertaken. The completion of a quantitative measure allowed for a relational analysis of the variables as well as the categorization of participants for focus group work. These quantitative findings are then balanced with more descriptive data obtained through qualitative (focus group) methodologies.

These data shed light on how and in what ways materialistic values are related to physical activity.

### Research Questions

The following research questions were developed in order to investigate the possible relationship between physical activity and materialism, and other possible factors that could influence that primary relationship. In a general sense, these questions are based on a series of assumptions: that a relationship between materialism and activity exists (ontological assumption); and that the relationship can be known (epistemological assumption) and understood through the methods described here (methodological assumption).

Research Question 1: Do materialistic values impact participation in physical activity?

Research Question 2: Do materialistic values influence the selection of physical activity location?

Research Question 3: Do materialistic values influence the individual's experience of physical activity?

Research Question 4: To what extent, if at all, are materialistic values and physical activity related to social norms?

Research Question 5: Are materialistic values a barrier and/or facilitator of physical activity?

### Assumptions

Aside from the most general presumption that participants of the study answered honestly each of the questions put before them, the research questions themselves are based on a series of assumptions. Those assumptions are as follows:

*Assumptions of Research Question 1:* With the global increase of consumption ideologies, it was assumed that materialistic values may be the dominant values system among college students and influence physical activity in some manner.

*Assumptions of Research Question 2:* It was assumed that materialistic values influence how, when, where, and why students choose to be physically active.

*Assumptions of Research Question 3:* The question assumes that materialistic values manifest themselves in tangible ways, thereby values then influence an individual's subjective experience of physical activity.

*Assumptions of Research Question 4:* It was presumed that injunctive and descriptive norms influence materialistic orientations as well as physical activity participation. Thereby, social norms should play an important influential role in the relationship between materialism and physical activity.

*Assumptions of Research Question 5:* It was presumed that a lack of image-related consumer goods may function as a hindrance to participation in activity through peer injunctive and descriptive norms (beliefs about others' expectations, and social modeling).

#### Limitations

There were a number of limitations that were acknowledged regarding this study, including the exploratory nature of the study, the use of self-report and convenience sampling techniques, the use of a theoretical model that has not been previously applied to physical activity, the use of statistical techniques for normalizing physical activity data prior to analysis, the measurement of physical activity through the use of METs as a unit of measurement, and the

indication of need for further revision of barriers and norm instruments. These limitations are addressed more completely in chapter 5 of this document.

### Delimitations

The parameters of the study consist of students at a large university in the southeastern United States. The study employed both quantitative and qualitative means of understanding the influence of materialistic values on physical activity participation, location, and experience. The quantitative survey instruments were used to establish value orientation as well as physical activity participation level into four categories: extrinsic values and physically active, extrinsic values and not physically active, intrinsic values and physically active, intrinsic values and not physically active.

The qualitative portion of this dissertation involves providing a deeper understanding of materialistic values and physical activity by conducting focus groups that are homogeneous in their values orientation and activity level. Participants had to complete the questionnaire in full and be between the ages of 18-24 years to be eligible for participation in the focus groups.

### Terminology

*Physical Activity.* Physical activity has been defined as “any bodily movement produced by skeletal muscles that results in energy expenditure” (Caspersen, Powell, & Christenson, 1985).

*Exercise.* Exercise is a subcategory of physical activity, with the important distinction of being “planned, structured, repetitive, and purposive” with an objective of improving or maintaining physical fitness (Caspersen et al., 1985).

*Metabolic Equivalent (MET).* A MET is a widely utilized method for expressing energy cost of various physical activities as a multiple of the resting metabolic rate (Byrne, Hills,

Hunter, Weisner, & Schutz, 2005). Physical activity research widely uses MET values as assigned in the Compendium of Physical Activities (Ainsworth et al., 1993) to standardize each specific activity intensity with an associated MET expenditure value (Haskell et al, 2007).

*Sedentary Behavior.* Behaviors that require low energy expenditure for prolonged periods, most often thought of as sitting time, for instance at work, home, leisure, while in transit (Owen, Bauman, & Brown, 2009).

*Moderate Activity.* Moderate activities are those that range from 3.0-5.9 METs (CDC, 2008c). Moderate intensity activities allow the participant to talk but not sing while they are being active, such as biking on level ground or with a few hills, or walking briskly (U.S. Department of Health and Human Services, 2008).

*Vigorous Activity.* Vigorous activities are those at or above 6 METS (CDC, 2008c). Vigorous intensity activities in bouts of 10 or more minutes are those where participants can only say a few words without needing to catch their breath, a few examples would be hiking up hill, jogging, running, or playing sports that have a lot of running, like soccer or basketball (U.S. Department of Health and Human Services, 2008).

*Physical Activity Recommendations.* The minimum MET minute value for meeting recommendations should be > 450 MET minutes per week (Haskell et al., 2007). These guidelines from the USDHHS encourage people to attain 2 hours and 30 minutes of moderate activity each week, and two sessions of strength training OR 1 hour and 15 minutes of vigorous activity and 2 sessions of strength training. The guidelines emphasize that activity must be accumulated through bouts of activity that last at least 10 consecutive minutes.

*Subjective Well-Being.* Subjective well-being is comprised of people's self-assessment, both cognitive and affective, of their lives (Diener & Suh, 2000, p. 14).

*Materialism.* This is the over-focus on the importance of having material possessions, the pursuit of material possessions and wealth, possession defined success, and acquisition as the pursuit of happiness (Richins & Dawson, 1992).

*Conspicuous Consumption.* Conspicuous consumption is described as using expensive possessions or activities to demonstrate wealth in a way that others will notice (Shukla, 2008).

*Extrinsic Values or Goals.* Extrinsic values or goals are those that are contingent upon reward or approval from others, such as financial success (money), social recognition (fame), and appealing appearance (image) (Grouzet et al., 2005; Kasser & Ryan, 1996).

*Intrinsic Values or Goals.* Intrinsic life goals are items that tend to focus more on self-actualized principles and are therefore associated with the ability to meet basic human psychological needs (Kasser & Ahuvia, 2002; Kasser & Ryan, 1996). Intrinsic life goals include things such as self acceptance, affiliation, and community feeling (Kasser & Ryan, 1996).

## CHAPTER 2

### LITERATURE REVIEW

The majority of American adults do not engage in enough physical activity to satisfy public health recommendations, although there are clear, publicized, and well-documented health benefits (CDC, 2008a). More than 50% of adults in America are not sufficiently or regularly active enough to meet recommendation levels, and one quarter of adults can be categorized as sedentary. Specifically, Alabama, Mississippi, and Louisiana are among the least active states with 41.7%, 39.6%, and 38.6%, respectively, meeting recommendations (Behavioral Risk Factor Surveillance System, 2007). Regular physical activity has many benefits, including weight control; reduction in risk factors for cardiovascular disease, type 2 diabetes, and various types of cancers; protective effects on muscular strength and bone density; and an increased chance of a healthier longer life (CDC, 2008b). The aforementioned benefits speak to the physical nature of health; however there are other factors that are also essential to well-being.

Some attention has been paid in recent years to social position, consumption, well-being, and health (Carlisle et al., 2008). It would appear that consumer culture is increasingly pervading our society, with an endless pressure to capitalize and commoditize as rapidly as possible. This contagion of conspicuous consumption (Shukla, 2008) only furthers the progression of inequalities in society, which has broad implications for mental and physical health and well-being (Carlisle et al., 2008).

Given the enormous societal pressure to consume, it might be easy for some individuals to attempt to satisfy their identity needs through materialism (Dittmar et al., 2007) and for many

more to be ensnared in a debt cycle that brings stress and possibly devastation to their lives (Varman & Belk, 2008), resulting in the reduction of quality of life and health. The following review of literature seeks to describe and draw together the respective literatures on physical activity and materialism so as to provide a foundation for the inquiry of materialism as an important contextual element for physical activity and health.

### The Application of Theory

The present study proposes the use of the integrated behavioral model (IBM; Fishbein et al., 2001) as a parameter and outline of constructs. In order to clarify how this theory was selected and used, the following section includes brief descriptions of other health behavior theories and why they are not an appropriate fit for the proposed study, a description of the development of the IBM from the theory of reasoned action and planned behavior, differences that arise between the two models, and possible measurement limitations in the use of the IBM for the present study.

#### *Theory Descriptions and Assessment of Theoretical Fit*

Health behavior theories that were not included in the proposed study include, among others, the transtheoretical model (TTM; stages of change), health belief model (HBM), social ecological model (SEM), and social cognitive theory (SCT). This section describes the reason that these theories, although salient to some investigations, are not the best suited to explore the relationships at hand.

The transtheoretical model was developed by Prochaska and DiClemente (1983) and has been commonly used with tailored interventions for smoking cessation programs. The TTM interjects a temporal element to behavior change theories by suggesting that people move through both stages and processes of change. The stages of change described by the model are

precontemplation, contemplation, preparation, action, and maintenance. The processes of change include consciousness raising, dramatic relief, self reevaluation, environmental evaluation, self-liberation, helping relationships, counter conditioning, contingency management, stimulus control, and social liberation (Glanz, Rimer, & Lewis, 2002).

The TTM has been utilized in physical activity interventions. Woods, Mutrie, and Scott (2002) found the TTM to be an effective approach for a self-instructional “active living” intervention with sedentary young adults. Marshall and Biddle (2001) conducted a meta analysis of the use of the TTM within physical activity and exercise and suggested three major points for consideration. First, the cross sectional design of the predominant number of studies does not allow for a clear understanding of transitions between stages or the causal factors of stage change. Second, because of the increased prevalence of including this model within research design, there was a need for standardization and improvement of the reliability of the measurement. Third, there were some questions of fit for the model as it is currently operationalized. The meta-analysis revealed that higher level constructs and stage-by-process interactions were not discernable within physical activity. This finding was, apparently, not a new one, but rather one that has been overlooked because of the utility of the two-factor (experiential and behavioral) model within smoking cessation. Nonetheless Marshall and Biddle suggested that these questions need to be addressed if the TTM is to continue to be applied within physical activity.

Although the TTM has been widely used, it is not without controversy. Some researchers suggest that many TTM-based interventions oversimplify the complex nature of physical activity behavior change and therefore may be less effective in creating activity maintenance/exercise adherence (J. Adams & White, 2005). Other investigators seek to temper oversimplification by

using other theories in conjunction with the TTM. One such example was the use of self-efficacy for a TTM-based physical activity intervention for obese women (Dallow & Anderson, 2003). The study assisted in moving participants from contemplation (90% of *n*) at baseline to action (16%) or maintenance (47%) over a 48-week time period. However, this small sample size study was prone to the same weaknesses previously described by Marshall and Biddle (2001).

One editorial, calling for researchers to move beyond the oversimplistic model to models that provide better descriptions of how behavior change occurs, suggested that the stage boundaries are arbitrary and at times incoherent, the model presumes that people tend to make stable behavior change plans, and finally that the total focus on conscious decision making processes takes away from what is already known about the motivational underpinnings of behavior change (West, 2005). The proposed study was a preliminary investigation into if and how materialism influences physical activity rather than a behavior change intervention. Ultimately, the TTM is not a good fit for inclusion in this study.

Another model that is often used in health behavior interventions is the health belief model. The HBM was developed in the late 1950s by Rosenstock and Hochbaum (Glanz, Rimer, & Lewis, 2002). The HBM provides a structure for individuals' perceptions of the threat posed by a health problem, the benefits of avoiding that threat, and the factors influencing the decision to act. The major constructs of the theory are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Glanz et al., 2002). Some refer to the inclusion of the self-efficacy construct as being an "expanded health belief model" (Wallace, 2002). For the purposes of this literature review, no distinction is necessary regarding model constructs.

The HBM is a value expectancy theory, which means that a personal value is placed on getting well or avoiding illness as well as an expectation that specific behaviors will prevent or decrease risk of illness or disease (Glanz et al. 2002). It is also an explanatory model used to predict the probability of an individual's performing preventative health practices (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). The original application of the model attempted to understand low participation rates in free Tuberculosis screenings (Glanz et al., 2002). The model has continued to be used in the health screening context with more recent studies in breast mammography, colorectal screenings (Glanz et al., 2002), and osteoporosis prevention (Wallace, 2002).

Perceived benefits and perceived barriers are among the constructs of the HBM that have been investigated in relation to physical activity rates (S. A Brown, 2005). A sample of undergraduates was surveyed to establish the psychometric properties of benefits and barriers in exercise scale. The study showed that perceived benefits were most influential in motivating activity. The use of traditionally aged college students might have had some influence on study outcome by a natural and situational decrease in the presence of barriers. College students are young and thereby have lower rates of chronic disease and have both greater potential for vigorous physical activity as well as access and proximity to facilities on most campuses (S. A. Brown 2005).

Another study of undergraduate exercise behaviors found perceived benefits most often related to appearance and physical performance, whereas barriers were most commonly related to time constraints and physical exertion (Grubbs & Carter, 2002). Regular exercisers were more likely to perceive significantly more benefits to exercise than those who were not regularly

involved in exercise. Unlike the previously mentioned study, perceived barriers were the most influential barriers of creating or maintaining regular exercise habits.

A third study used the HBM along with social support and self-efficacy to investigate health behaviors (smoking, alcohol, physical activity, nutrition, general safety, and sun protection) in a college population (Von Ah et al., 2004). Perceived threat (perceived severity and perceived susceptibility), perceived benefits, and perceived barriers were explored. Perceived barriers were found to have a significant impact on health behaviors. However, the most important variable in the study was self-efficacy, as it had strong relationships with all of the behavior changes. Like the TTM, the HBM is not well suited for inclusion in this study. The constructs, by and large, are not a good fit with the investigational goals at hand, as the study desires to explore materialism as a driving force of health behavior.

Ecological models became of interest in research as psychology sought to understand how environment influences human development and behavior (Glanz et al., 2002). Familiar historical names such as Kurt Lewin and BF Skinner were the forerunners of this field of inquiry. Psychologist Urie Bronfenbrenner was also integral in the development of the ecological approach to behavior. His book *The Ecology of Human Development* (1979) provided a strong argument for the consideration of multiple levels of environmental influence, levels that he described as microsystem, mesosystem, and exosystem this contribution is discussed in more depth in Glanz et al., 2002. The social ecological model (SEM) drew from these foundations into a model that was inclusive of both individual and social environmental factors (McLeroy, Bibeau, Steckler, & Glanz, 1988). As with previous models, the SEM suggests a multilevel approach that includes individual/ intrapersonal, interpersonal, community, institutional, and public policy domains. The SEM is so broad and encompassing it can be hard to find examples

of the model used in its entirety for intervention. One commonly cited historical use of the multilayered SEM approach is the North Karelia Project, which began in 1972 in Finland (Puska, 2002). Grzywacz and Fuqua (2000) used the model to provide examples of linkages to social health indicators and discuss benefits and limitations of the model. Elder et al. (2007) provided a physical activity specific use of the SEM. The Trial of Activity for Adolescent Girls (TAAG) used the SEM approach for a multisite intervention focused on reducing the decline of physical activity in adolescent girls. The TAAG intervention used multiple theories (operant learning, social cognitive, and TTM) and approaches to make sure the different components (levels) were complimentary and cohesive, which is a challenging task in a large scale, multisite intervention. The present study originally considered using a model such as SEM or social cognitive theory (SCT) to incorporate the environmental aspects of physical activity. However, other models have incorporated the physical and social environmental aspects and provide a more comprehensive fit.

The SEM and the SCT share some common features (Montano & Kasprzyk, 2008). Some might suggest the principal difference lies in the integration of policy of the SEM. However, in a recent discussion of health promotion by social cognitive means, Bandura (2004) suggested that a nation's or a community's health is a social responsibility, not just an individual one. His discussion of the importance of enabling collective change through political environmental and social conditions that influence health further blurs the line between the SEM and SCT.

Bandura (2004) stated that the SCT is an outcome expectations theory; that is to say, people's health behaviors are influenced by the outcomes they expect as a result of their actions. Outcome expectations can take different forms. Physical outcomes are the pain or pleasurable results, the material losses, or the benefits that are expected as a result of the behavior. Social

outcomes are the various levels of approval or disapproval one experiences in their personal relationships with regard to a given behavior. A third type of outcome expectation is that of self-evaluative outcomes. Self-evaluative outcomes imply that people are motivated to alter their behavior so that they can increase self-approval and decrease self-dissatisfaction.

Bandura (2004) continued to explain that the well known concept of self-efficacy also shapes one's expectations of their efforts. Bandura (1977) defined *self-efficacy* as the belief that one can successfully perform a behavior. Trost, Owen, Bauman, Sallis, and Brown (2002) conducted a comprehensive review of literature regarding the correlates of physical activity. The research team found self-efficacy to be the most consistent correlate of physical activity. Self-efficacy has been incorporated into many theories because of its consistent appearance as a correlate and possible predictor variable, and has regularly been associated with physical activity participation. As such, although self-efficacy is not directly related to the proposed questions in the current study, some measurement of the construct is essential to control for the effects of self-efficacy as a covariate of physical activity within the model.

Bandura (2004) suggested that although there are many different models of health behavior, a vast majority of them include different versions of outcome expectancies, the theory of reasoned action being no different. Bandura framed the constructs in a manner congruent with his theoretical viewpoint. He described the construct of attitude as being measured by perceived outcomes and the personal importance placed on those outcomes. Similarly, norms are defined as being measured by the perception of pressure for certain behaviors and the person's willingness to conform to that pressure. The advantage of using TRA in conjunction with SCT is that both seek to understand or predict outcome expectancies in relation to physical and social outcomes, but SCT also seeks to describe behavior impediments (personal and situational; Bandura 2004).

The SCT, ultimately, is not the best fit for the study at hand in its entirety, and the constructs that are most relevant have been integrated into the IBM.

*The Theory of Planned Behavior and Development of the IBM*

The theory of reasoned action was introduced by Fishbein in 1967. The theory focused on the interrelationships of belief structures, attitudes, and, most importantly, intentions as the influential motivation factors of subsequent behavior (Glanz et al., 2002). In the early 1990s, additional constructs that relate to volitional control (control beliefs, perceived power, and perceived behavioral control) were added to the model, and it was named the theory of planned behavior (TPB). The most current version (2002) of the TPB is available through Ajzen's web page at the University of Massachusetts (Ajzen, n.d.).

The proposed study intends to use an Integrated Behavioral Model (IBM), which was derived from the TPB. Therefore, a more thorough discussion of the TPB model is warranted. The following explanation of TPB constructs was driven by the current TPB model as outlined on Ajzen's web page. Constructs include behavioral beliefs and attitude, normative beliefs and subjective norms, and control beliefs and perceived behavioral control (PCB); each pair of which influences intention to perform the behavior and the subsequent performance of the behavior.

*Behavioral belief* is the subjective likelihood that behavior in question will produce a given outcome. The TPB presumes an amalgamation of behavioral beliefs and one's value of the expected outcome, form the *attitude* toward the behavior. Ajzen theorized a direct proportionality between each evaluation of outcomes and the perceived likelihood the behavior would produce the outcome and the development of the attitude toward the behavior (Ajzen, n.d.).

*Normative beliefs* are the perceived expectations of the referent group or individuals. The TPB presumes that normative beliefs combined with individual motivation to comply with referent beliefs produce *subjective norms*. As with behavioral beliefs, the TPB suggests a directly proportional relationship between the perception of referent beliefs and the motivation to comply in the creation of subjective norms (Ajzen, n.d.).

*Control beliefs* represent the perception of facilitators and/or barriers to the performance of the given behavior. Control beliefs and perceived power to enact those beliefs combine to form *PCB*, the subjective perception of the ability to perform the behavior (Ajzen, n.d.).

Among the more recent changes in the TPB includes the addition of the construct of *actual behavioral control*. This construct allows for the influence of actual skills, knowledge, or resources (any given prerequisite of performance) regarding the behavior. It is truly the individual's actual ability to perform the behavior (Ajzen, n.d.).

#### *Different Conceptualizations of Constructs in the IBM*

The IBM emerged from a workshop hosted by well-known theorists and organized by the National Institute of Mental Health (Fishbein, Triandis, et al., 2001). The workshop was attended by top-level health theorists like Bandura, Becker, Fishbein, Kanfer, and Triandis. The theorists came up with some major points of consensus out of which the IBM was developed. It is clear that much of the new integrated behavioral model is heavily derived from the TPB. Although most often referred to as the IBM it may also be referred to as the integrative model of behavioral prediction.

Montano and Kasprzyk (2008) recommend the use of the IBM, as it includes the TPB constructs in addition to influential constructs from other theories. As with the TPB, a key determinant in the IBM is intention. Intention, in the IBM, is formed by attitudes, perceived

norms, and personal agency; constructs are based on the TPB but more clearly defined and differentiated. The TPB constructs were explained previously, so the subsequent discussion is focused on the explanation of any additional items or clarification of similar items that are conceptualized differently.

*Attitude* is segmented into two portions: experiential and instrumental. Experiential attitude is one's positive or negative emotional feelings (affective response) about performing the behavior. Instrumental attitude is cognitive in nature and based on one's beliefs about outcomes of performing the behavior (as with TPB; Montano & Kasprzyk, 2008).

*Perceived norm* is, similar to TPB, an individual's perception of social pressure to perform (or not perform) a given behavior. Perceived norm is comprised of two components: injunctive and descriptive norms. The TPB used injunctive norms in its model, focusing on the pressure felt from referent sources about the behavior. The IBM would suggest that the injunctive norm by itself is incomplete, because it does not allow for the influence of what the individual sees others doing. A descriptive norm includes modeling and social identity. In other words, the stronger an individual's perception of referent pressure and referent modeling is, the stronger the sense of pressure to comply (Montano & Kasprzyk, 2008).

*Personal agency* is comprised of perceived control and self-efficacy. Perceived control is the amount of control individuals feel about their performance, as with the TPB. This construct is largely influenced by the strength of perceived facilitators or barriers within the environment. Self-efficacy is used consistent with Bandura's definition: an individual's level of confidence in his or her ability to successfully perform the behavior (Montano & Kasprzyk, 2008).

Attitude, perceived norm, and personal agency come together to influence the intention to perform the behavior, and the strength of that intention influences the likelihood of the behavior.

The IBM (shown in Figure 1) has additional constructs that it proposes directly influence behavior. The additional constructs include knowledge and skills to perform the behavior, salience of the behavior, environmental constraints, and habit (previous performance; Montano & Kasprzyk, 2008).

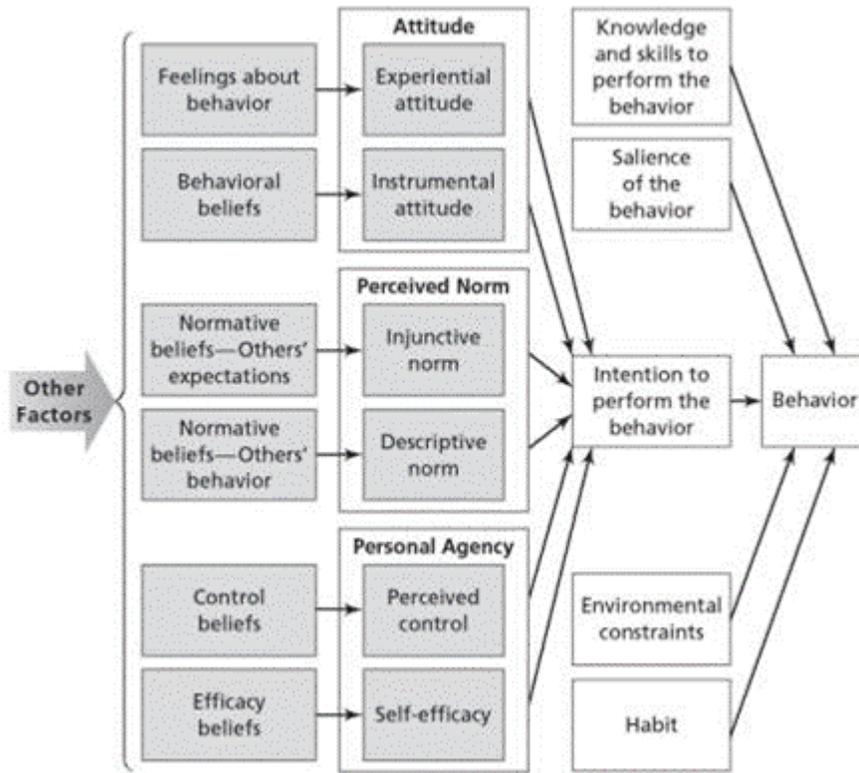


Figure 1. The integrated behavioral model. From Montano and Kasprzyk’s Figure 4.2, p. 77.

*Possible Theoretical Measurement Limitations*

Unfortunately, very little literature is currently available on the use of the IBM, and the little that is available centers around the use of theory in interventions. Specifically, applications of the theory in research on HIV/AIDs and condom use. The work of Fishbein and co-investigators contributes the majority of the available literature. Two programs specifically have used the model in their interventions (both focusing on HIV/AIDS and condom use): Project

SAFER and Project RESPECT. Project SAFER was an intervention aimed at understanding condom use intentions among HIV/AIDS and STD high-risk groups (Fishbein, von Haefen, & Appleyard, 2001). Similarly, Project RESPECT was a multisite controlled trial also aimed at persons using public health clinics for STDs (F. Rhodes, Stein, Fishbein, Goldstein, & Rotheram-Borus, 2007). One additional study was found using this model: an investigation of factors that influenced smoking of friends and family in the presence of an infant (Crone, Reijneveld, Burgmeijer, & Hirasing, 2001). Content discussion of the previously noted studies was not particularly pertinent to the proposed study.

Fishbein and Yzer (2003) made clear that the first critical issue in using the IBM is to determine the behavior that is to be investigated. In so doing they outline the distinction between behavior, behavior categories, and goals. A specific behavior in this case would be to meet current physical activity recommendations (CDC, 2008b; Haskell et al., 2007); whereas a behavioral category would be to exercise, and a goal might be to lose weight as a result of exercise. Once a specific behavior has been identified, the model can be used to understand why the population is or isn't participating in that behavior (Fishbein & Cappella, 2006; Fishbein & Yzer, 2003). The investigator is able to establish whether people are or aren't performing the behavior because of a failure to establish intent, as well as differentiate the specific constructs that influence the development of intent (attitudes, norms, and self-efficacy; Fishbein & Cappella, 2006; Fishbein & Yzer, 2003).

The main limitation of using this theory in regard to physical activity is that the IBM has not yet been applied to physical activity behaviors. Therefore, the present study is left considering two options. First, the present study could endeavor to be the first to assess the model's function in regard to physical activity by creating an instrument. This approach would

make the investigation of the underlying belief structures the primary goal of the study. For example, rather than assuming the relationship of self-efficacy to physical activity that has been established in the literature, the study would seek to establish this relationship, thereby establishing the use of the IBM for future physical activity research.

The second option is to use the body of knowledge presently available to describe the basic belief structures and presume that these basic beliefs are correctly understood within the literature. This approach would rely on the literature available for each of the individual constructs as they have been previously conceptualized. These established belief structures would then be applied to the framework of the model and the results compared to the individual's materialism assessment. One major problem with this approach was that some constructs have been freshly conceptualized for this model, thereby making some of the findings of previous studies not as applicable in the current context. Using constructs as previously conceptualized also leaves the present study prone to inherit the weaknesses associated with the ways in which they have been previously conceptualized and measured. Additionally, this approach assumes that the constructs and their originating theories have been applied to physical activity. Specifically, the TPB has a fair amount of literature in regard to exercise behavior but has not been used as frequently in assessing the more general term of physical activity. Physical activity is inclusive of domains such as self-transport and leisure time activities that are outside of traditional "exercise" activities.

#### Literature on Physical Activity

##### *Defining Physical Activity and Its Measurement*

*Physical activity* has been defined as "any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen, Powell, & Christenson, 1985). The term

*exercise* is often incorrectly used synonymously with physical activity. Exercise is a subcategory of physical activity, with the important distinction of being “planned, structured, repetitive, and purposive” with an objective of improving or maintaining physical fitness (Caspersen et al., 1985).

The metabolic equivalent (MET) is frequently used to assist in the determination of intensity of physical activity. A MET is a widely utilized method for expressing energy cost of various physical activities as a multiple of the resting metabolic rate (Byrne et al., 2005). Physical activity research widely uses MET values as assigned in the Compendium of Physical Activities (Ainsworth et al., 1993) to standardize each specific activity intensity with an associated MET expenditure value (Haskell, et al., 2007). The process of MET expenditure in combination with duration of activity creates MET minutes which are the basis for the guidelines for physical activity (Haskell et al., 2007). This approach is not without concerns, however. Researchers must acknowledge the possibility that MET values may overestimate the energy expenditure of the participant (Byrne et al., 2005). The original value of one MET was ascertained from the resting oxygen consumption ( $VO_2$  of 3.5ml per kg per minute) of a 40-year-old male weighing 70 kg. Research has shown support for questioning the exacting accuracy of MET values based on variables such as gender, age, and body composition (Byrne et al., 2005). Although the use of MET values is not without fault, it is still the dominant method used in self-report physical activity research.

Activity intensity descriptors, moderate and vigorous, have both technical and practical definitions. In the technical sense, moderate activities are those that range from 3.0-5.9 METs, and vigorous activities are those at or above 6 METS (CDC, 2008c). The current recommendations state that when a study calls for the combination of moderate and vigorous

intensity exercise to establish categories of “meeting recommendations” versus “not meeting recommendations,” the MET minute value for meeting recommendations should be, at minimum, > 450 MET minutes per week (Haskell, et al., 2007).

When these terms are used with the general population they are phrased in more common vernacular and paired with examples of activities of that intensity. The CDC (2008c) and the U.S. Department of Health and Human Services (USDHHS) published the guidelines in an attempt to reach the public in “Be Active Your Way: A Guide For Adults” (USDHHS, 2008). In the booklet, moderate intensity activities in bouts of 10 or more minutes allow the participant to talk but not sing while they are being active, such as biking on level ground or with a few hills or walking briskly. Vigorous intensity activities in bouts of 10 or more minutes are those where participants can only say a few words without needing to catch their breath. A few examples would be hiking up hill, jogging/running, or playing sports that have a lot of running like soccer or basketball (USDHHS, 2008). These guidelines from the USDHHS encourage people to attain 2 hours and 30 minutes of moderate activity each week, and two sessions of strength training OR 1 hour and 15 minutes of vigorous activity and 2 sessions of strength training. The guidelines emphasize that activity must be accumulated through bouts of activity that last at least 10 consecutive minutes.

For this study, it was important to discern those who are active from those who are not. This will most likely reflect people who are purposive in their activity (“exercisers”) from those who are not. Therefore, participants were placed into quintiles based on their MET minutes of activity so that the most active would be discernable from the least active groups.

As previously stated, some researchers have found less than 60% of their sample populations meeting physical activity recommendations (Giles-Corti & Donovan, 2002a).

Entrance into adulthood, and for many college, represents a dynamic time of change and challenge, as well as freedom and control over lifestyle decisions. Health behaviors of college students may be especially important as they are likely to have some sustaining impact across the lifetime (Von Ah et al., 2004). Developing a more clear understanding of college student physical activity provides an important springboard for future health promotion interventions. The following segment of literature was designed to address demographic, physical environment, as well as, psychosocial correlates of physical activity.

### *Demographic Correlates of Physical Activity*

Demographic variables relevant to the present study include race, gender, age, and socioeconomic status or position. Differences in activity levels and patterns establish themselves early, in childhood, for many racial and ethnic groups (Bauman et al., 2002). Many of these differences continue to pervade lifestyle behavior through adolescence and into adulthood. Specifically, non-Hispanic White males tend to be more active than any other group, whereas African American and Mexican American females tend to be the least active. These findings also support the generally held belief that men tend to be more active than women (Bauman et al., 2002). It is not clear the extent to which racial difference in physical activity is an artifact of confounders such as socioeconomic position, gender, or inaccuracies of domain measurement (household activity, etc.; Seefeldt, Malina, & Clark, 2002).

As stated previously, in general, men tend to be more active than their female counterparts (Bauman et al., 2002, Buckworth & Nigg, 2004; Dinger & Behrens, 2006; Seefeldt et al., 2002), and this pattern appears to continue into older age (Booth, Owen, Bauman, Clavisi, & Leslie, 2000). Some research suggests that gender differences in outcome behaviors such as physical activity may be a reflection of gender differences in the underlying constructs or

correlates. For example, college student motives for participation in physical activity may differ by gender (Kilpatrick, Hebert, & Bartholomew, 2005). Weight management motives were more strongly associated with exercise behavior than sport participation, especially among women. Whereas men were more motivated by performance, competition, and social recognition (ego) factors regardless of activity type (Kilpatrick, Hebert, & Bartholomew, 2005). Netz and Raviv (2004) found that self-efficacy of specific activities differed by gender and with increasing age. Older persons had lower self-efficacy and expected fewer benefits than younger persons.

Age has been shown to have an inverse association with physical activity (Addy et al., 2004; Bauman et al., 2002; Sallis, 2000; Seefeldt et al., 2002). Sallis suggested in a review of human and animal physical activity that the largest annual declines in activity occur during adolescence, and that a similar decline is also apparent within animal species, indicating that there may be some biological genesis to the reduction in activity. The decline varied by gender, activity type, as well as intensity. Although this decline has garnered empirical support, it stands in opposition to public health objectives.

Much like gender, age may interact with psychosocial variables (De Bourdeaudhuij & Sallis, 2002) and create differences in activity level dependent on life stage. The implications of this finding are that not only does physical activity participation attenuate over time, but also that specific correlated variables will be more or less important to consider depending on targeted participant age. It is therefore necessary to have a clear understanding of physical activity among college populations for the present study.

In support of the general finding that activity decreases with age, Buckworth and Nigg (2004) found that younger college students spent more time in vigorous activity and stretching than older students. Age had a particularly strong relationship to inactivity in females of this age

group included in the study. Accelerometer research on free living college students supports the commonly purported belief that although college students may collect more minutes of activity than older counterparts, when the data was considered cumulatively by day approximately half of the study participants met recommendations for moderate activity (Dinger & Behrens, 2006). As with the population at large, the other half of this college student sample was insufficiently active. The majority of college students, additionally, did not participate in any significant amount of vigorous activity. When analyzed selectively for bouts above 10 minutes in duration (as per recommendations), the vast majority did not meet the recommendations for moderate activity. Additionally, college students tend to be more active during the week, indicating that the process of getting themselves to and from classes and other activities may largely constitute their activity (Dinger & Behrens, 2006).

Another psychosocial variable that may vary within the age group are social environment factors such as social support and companionship. De Bourdeaudhuij and Sallis (2002) found that 16-25 year old males were influenced by social variables, most importantly accompanying social support, whereas females tended to be influenced by social support of encouragement as well as social modeling. The benefits of physical activity most valued among males were related to competition, whereas females valued the general health benefits of activity. Self-efficacy (discussed in more detail later) was found to contribute significantly for both genders in the age group.

Studies have demonstrated a correlation between lower socioeconomic status (SES) or position and decreased participation in physical activity (Bauman et al., 2002), and more specifically that lower SES groups are significantly less likely to participate in vigorous activity (Giles-Corti & Donovan, 2002b). Giles-Corti and Donovan suggested that the factors influencing

behaviors in SES groups may vary by group (i.e., perceptions about safety or social norm behaviors may vary). Low SES groups perceived their neighborhoods as less aesthetically pleasing and having less social support for walking. Both convenient walking destinations and attractive environments have been positively correlated with walking behavior.

There is a fair amount of incongruence within physical activity research focusing on SES. Giles-Corti and Donovan (2002b) suggested that lower SES areas in Australia had more access to public recreational facilities, but that income might better predict vigorous activity participation than residence location. Conversely, Gordon-Larsen, Nelson, Page, and Popkin (2006) found lower SES and higher minority areas were less likely to have proximal facilities. Accordingly, the researchers proposed the possibility that disparities in access for lower SES groups and minorities might contribute to differences in adolescent physical activity participation and obesity rates between ethnic groups (Gordon-Larsen et al., 2006). Yet others proposed that the relationship of SES to physical activity may in part be due to differing levels of social capital between groups; that is, different groups may feel they have more influence on their health outcomes than others (Lindstrom, Hanson, & Ostergren, 2001). Still others purported disparities between groups as related to lack of health care access for lower SES groups (McNeill, Krueter, & Subramanian, 2006).

In general, SES or socioeconomic position is often paired with income inequality as an element of the social environment (McNeill et al., 2006). Persons of high income, and thereby SES bracket, with more education (Addy et al., 2004; Ainsworth et al., 2003; Bauman et al., 2002; Lindstrom et al., 2001) are more likely to adopt health protective and health promoting behaviors, as well as have decreased participation in health risk behaviors than those of lower

SES positions (McNeill et al., 2006). Clearly, the mechanism by which SES influences physical activity and health outcomes is not entirely understood.

### *Physical Activity and the Physical Environment*

The relationship between physical activity and the physical or built environment is a complex one (Giles-Corti & Donovan, 2002b). Consistent findings show an association between physical activity and the physical environment (Humpel, Owen, & Leslie, 2002), although it is not clear to what extent or the relative role within the many covariates of activity. The examination of the physical environment's relationship to physical activity is not a new endeavor, nor is it an interest unique to the field of health education or public health (Bedimo-Rung, Mowen, & Cohen, 2005; Pikora et al., 2002). Those interested in the intersection of space and place (Lefebvre, 2001) and those with interests in understanding social exclusion and inclusion have attempted to describe the influences of the environment of activity spaces (Schonfelder & Axhausen, 2003).

Researchers espousing a social ecological approach place the physical environment as a central focal point of their work (Humpel et al., 2002) and would argue that the physical environment exerts a direct influence on physical activity participation, and this relationship is mediated by psychosocial factors (Spence & Lee, 2003). Addy et al. (2004) would agree, finding that neighborhood variables (built environment) were stronger predictors of physical activity than community social environments. Clearly an understanding of physical environments, especially if considering the implications of chronic disease prevention, has ramifications for design, urban planning, policy makers, leisure, transportation researchers, and allied health professionals (Lee & Moudon, 2004; Owen, Humpel, Leslie, Bauman, & Sallis, 2004).

There are a variety of perspectives to consider within research of the physical environment. As discussed in detail following, physical activity within the built environment has been considered from perceived and actual access to facilities, walkability, as well as barriers and facilitators, just to name a few. Inherent in these perspectives however is the inference of activity domain: where and how activity takes place. This topic deserves to be addressed before progressing further through the literature and is of particular relevance to the study at hand.

Physical activity research often represents information that is domain specific (Abu-Omar & Rutten, 2008). Measurement by domains is a practical approach to data collection. However, there is a need to connect the various domains in some meaningful way as to get a more comprehensive “big picture” view of physical activity. Abu-Omar and Rutten proposes the presence of four domains for measurement: leisure time, occupational, domestic, and commuting (self-transportation). Leisure time activity is inclusive of exercise behavior, which is the historical origin from which physical activity for health purposes developed (Dunn, Anderson, & Jakicic, 1998). In essence, exercise and leisure time activity represented the preponderance of literature until recent interest developed for better understanding the various and more inclusive methods and environments for accumulating activity.

Access to facilities, as mentioned in the discussion of SES, has had varied results in physical activity literature. Bauman et al. (2002) in a review of literature found that actual access to facilities had a weak positive association with physical activity, whereas perceived access to facilities had a repeated lack of association with physical activity. Brownson et al. (2004) disagreed by finding that there is a positive association and further stated that it is unclear whether perceived or actual environmental variables have more explanatory ability.

Access to local facilities was found to have a positive association for older adults (Booth et al., 2000), and Sallis et al. (2001) found that physical improvements to school grounds, along with more supervision, increased the percentage of child participation in activity four fold. Furthermore, Sherwood and Jeffery (2000) suggested a modest relationship between access and exercise among adults. Kirtland et al. (2003) attempted to assess the relative congruence of perception and objective measures of the environment and found fair and low levels of agreement. Some possible explanations for the lack of agreement include participant's inability to judge distances and judging the environment based on one's own lifestyle behaviors, beliefs, desires, and expectations.

From the perspective of methodology, both perception and objective measures have their benefits. Objective measurement allows for more simple enumeration of destinations, easier standardization of measurement, and a more simplistic translation for policy purposes. However, individual perceptions are important if the goal is to change behavioral outcomes like increasing physical activity (Lee & Moudon, 2004). In the present study, the campus environment was a stable variable to which all students have access.

The walkability of a given neighborhood has implications for both recreation and self-transportation activities. Saelens, Sallis, Black, and Chen (2003) found that neighborhood walkability was associated with physical activity and weight status. Walking to work has been shown to have a significant relationship with neighborhood environment score, moderated by extent of urbanization (Craig, Brownson, Cragg, & Dunn, 2002). Another study of self-transportation and recreation walking found that self-transportation was negatively associated with objective measurement results for areas where sidewalks were not level, as well as perceived and objective neighborhood aesthetics (Hoehner, Ramirez, Elliott, Handy, &

Brownson, 2005). Walking for self-transportation and recreation was positively associated, however, with both perceived and objective numbers of destination locations, access to public transit, and perceptions of access to bike lanes as well as objective measures of social modeling within the community. Recreational activity was positively associated with perceived access to facilities and objective measures of aesthetics (Hoehner et al., 2005).

Self-transportation has been found to contribute significantly to total physical activity in highly walkable environments (Saelens et al., 2003). Participants in high walkable areas engaged in approximately 70 additional minutes of activity per week as compared to those in less walkable environments. However, Giles-Corti and Donovan (2003) found in a study on the influence of environmental factors on walking, that whereas most walked for either recreation or transport, only 17.2% of their sample walked enough to satisfy recommendations. Owen et al. (2004) added some clarity by pointing out that important physical environment attributes conducive to walking for exercise or recreation may differ from those associated with walking for self-transportation. Finally, Craig et al. (2002) called for an integration across disciplines to better understand physical environment implications on self-transportation, among other things.

Whether used for recreation or self-transport, sidewalks and other “informal” facilities (like public open spaces, beaches, or streets) have been shown to be the most frequently used facilities for activity (Giles-Corti & Donovan, 2002a). In concurrence, the presence of sidewalks and lighter traffic patterns has been related to engaging in activity (both meeting recommendations and those that were insufficiently active to meet requirements; Ainsworth et al., 200; Brownson, Baker, Housemann, Brennan, & Bacak). African American women reporting sidewalks in their neighborhoods were 57% more likely to meet recommendations than those without sidewalks (Ainsworth et al., 2003). The findings of Hoehner et al. (2005) clarify the

previous findings by stating that it is not the presence of sidewalks but rather the quality of sidewalks (levelness) that correlated with activity.

Many other environmental variables have been less conclusively related to physical activity. These prohibitive elements, or “barriers,” include lighting at night, crime and safety, presence of unsecured dogs, destinations within walking distance (Ainsworth et al., 2003; Booth et al., 2000), attractiveness (Humpel et al., 2002), and climate or season (Bauman et al., 2002) have been associated, albeit inconsistently, with participation in physical activity. As the literature on the physical environment and physical activity continues to grow, Lee and Moudon (2004) put out a call to urban and transportation planning personnel to address potential interventions to decrease barriers and increase enablers of physical activity.

Barriers to physical activity have been shown to have a consistent negative association with physical activity participation (Bauman et al., 2002; Sherwood & Jeffrey, 2000). The most commonly cited barriers to activity include lack of facilities (Ainsworth et al., 2003; Humpel et al., 2002; Lee & Moudon, 2004), as well as some of the inconsistently associated variables such as not having sidewalks, unattended dogs, poor or nonexistent street lighting (Ainsworth et al., 2003), injury avoidance (Sherwood & Jeffery, 2000), and concerns about crime (Humpel et al., 2002; Lee & Moudon, 2004). Other variables may include demographic factors such as older age, SES, geographic location, geographic characteristics, as well as poor personal health and individual disabilities as social and environmental barriers to activity (Seefeldt et al., 2002).

Additionally, personal barriers such as lacking time (Brownson et al., 2001; Lee & Moudon, 2004; Sherwood & Jeffery, 2000), being too tired, lacking energy, lacking motivation, and not enjoying or liking activity (Salmon, Owen, Crawford, Bauman, & Sallis, 2003; D. M. Williams, Anderson, & Winnett, 2005) demonstrated inverse relationships with physical activity

participation (Brownson et al., 2001). As mentioned previously, lack of time was a barrier commonly reported by both those engaged in regular activity and those who were not (Sherwood & Jeffery, 2000). Therefore, in order for someone to become regularly active, they must be able to become adept at dealing with this barrier. Life period and gender roles often are covariates with this barrier, for example becoming a parent often lessens physical activity for the mother, and care giving or child rearing are often suggested as contributors to the time–activity barrier (Sherwood & Jeffery, 2000).

Many of the facilitators or enablers of physical activity are the antithesis of the barriers. For example, one study found that accessible facilities, improved lighting in the streets, sidewalks, and organized exercise groups were enablers of activity among African American women, as were additional opportunities at the work site, such as provision of facilities at work, group activities, allowing time for activity, and longer breaks (Ainsworth et al., 2003). As discussed previously, distance to a facility or destination is generally seen as a barrier to activity for self-transportation (Giles-Corti & Donovan, 2002a) and recreation (Kirtland et al., 2003) if the location is distal; however, it can function as a facilitator if the destination is proximal (Hoehner et al., 2005). A possible additional moderator of facility and destination use is the previously mentioned topic of aesthetics (Giles-Corti & Donovan 2002a). These enabling or facilitating relationships often fail to strongly demonstrate a direct association with meeting physical activity recommendations, which indicates that individual or social level factors must also be present to encourage physical activity (Hoehner et al., 2005; Humpel et al., 2002)

Additionally, facilitators of activity also tend to encompass psychosocial factors that are discussed in detail following. One example of this was the finding that walking with one or more partners (social support) greatly increased the chances of meeting physical activity

recommendations, as did dog ownership (Giles-Corti & Donovan, 2003). Although a strong case has been made for the influence of physical environments on physical activity, changing the environment alone may not be enough to change American patterns of physical activity or inactivity (Giles-Corti & Donovan, 2002a; Bauman et al., 2002). To that end, in a study mentioned earlier (Sallis et al., 2001), an examination of school environments found that physical playground environments' improvements significantly improved activity. However, equally important for increasing activity was the presence of supervision during use. The study also found that an extremely low percentage of children chose to be active during unstructured time (2% girls, 5% boys), meaning that it isn't always just the availability of facilities, but the increase in social resources (encouragement to use the facility) that created the change in activity levels.

#### *Social Environments and Psychological Variables of Physical Activity*

Physical activity is influenced by the dynamic interplay of physical, social, and biological environments and factors (Spence & Lee, 2003). How social environments and psychological factors are defined, function, and interact is the source of much ongoing research. Yen and Syme (1999) described social environments as being inclusive of social groups, neighborhoods of residence, organization structures of our workplaces, and policies created to lend order to our lives. Barnett and Casper (2001) defined *social environments* as encompassing “the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact” (p. 465). Others advocate that the social environment is comprised of the following five key elements: social support and networks, socioeconomic position and income inequality, racial discrimination, neighborhood factors, and finally social cohesion and social capital (McNeill et al., 2006)

The social environment can also influence epidemiologic disease pathways (Yen & Syme, 1999). From an epidemiologic perspective, prevention of disease can take two paths; individual responsibility and/or prevention through environmental change (Yen & Syme, 1999). It is this environmental change that social marketers attempt to harness to nudge people into improved health decisions (Thaler & Sunstein, 2008).

Yet, there are criticisms of social environment research. For example, one study purported that measurement instruments of the social environment are less reliable than measurements of the physical environment (Brownson et al., 2004). In spite of measurement limitations, there is a large body of literature addressing various social environmental characteristics as they pertain to physical activity. The following section addresses specific concepts within social environments as well as psychological constructs that are relevant to physical activity and the IBM. These concepts and constructs include social networks, social support, outcome expectancies, attitudes, norms, personal agency (perceived control and self-efficacy), and the influence of previous behavior.

*Social networks* have been defined as “a person centered web of social relationships” (Montano & Kasprzyk, 2008, p. 187). Social networks are often portrayed as an origin of negative health behaviors, but it is possible for these groups to exert positive and protective influences (Voorhees et al., 2005). In example, female adolescents with physically active friends were found to be more likely to engage in activity themselves (Voorhees et al., 2005). Emmons, Barbeau, Gutheil, Stryker, and Stoddard (2007) measured social norms, social networks, and social support and found them all significantly related to self-reported physical activity. However, after adjusting for moderators such as age, gender, race, and marital status, social networks remained significant, whereas social norms and social support did not.

Social support and social networks are often considered to be one category or construct during the evaluation of social environments, by jointly defining them as interpersonal relationships and interactions, and the extent of interconnectedness within a community (McNeill et al., 2006). Some suggested mechanisms by which social networks and social support might encourage physical activity include provision of social support, development of enabling social norms, access to resources, social bonding, as well as positive benefits from social modeling (McNeill et al., 2006).

Social support has been defined as “aid and assistance exchanged through social relationships and interpersonal transactions” (Montano & Kasprzyk, 2008, p. 187). The major types of social support that can be offered come in the form of emotional, instrumental, informational, and appraisal support (Montano & Kasprzyk, 2008; Sharma, Sargent, & Stacy, 2005). Emotional support is described as the provision of care and trust (Langford, Bowsher, Maloney, & Lillis, 1997). Instrumental support is the provision of tangible assistance, services, or goods. Informational support is described as assistance in problem solving (Langford et al., 1997). Appraisal support is the communication of information regarding the individual’s ability to self-evaluate, often in the form of affirmation of a choice or behavior (Langford et al., 1997). Sharma et al. (2005) found in a study of African American women their respective importance to be the same as the order given, indicating emotional support was the most important form of social support for their sample. Some research chooses to dichotomize social support by its origin, friend, and family rather than its type (Resnick, Orwig, Magaziner, & Wynne, 2002).

Social support from friends and family is often reported as being correlated with increased physical activity (Ainsworth et al., 2003; Bauman et al., 2002; Brownson et al., 2001; Kim & Sobal, 2004) either directly or indirectly through its influence on other constructs like

self-efficacy and outcome expectancies (Resnick et al., 2002), although some would question these findings as overstating an inconsistent relationship (Lewis, Marcus, Page, & Dunn, 2002).

In an international study of the importance of social environment for a physically active lifestyle, Stahl, Rutten, Nutbeam, Bauman, Kannas, Abel, et al. (2001), found that the strongest independent predictor of activity was social support from the individual's immediate social environment. People reporting low social support were more than two times as likely to be sedentary than those reporting high levels of social support. However, it has also been reported that people who are more active tend to report more social support (Sherwood & Jeffery, 2000). Therefore, the direction of the relationship is not established. In addition, Sherwood and Jeffery added that the relationship between activity and social support is a dynamic one that is likely to change over the process of adoption or maintenance of physical activity behavior.

Outcome expectancies are positively correlated with physical activity (Bauman et al., 2002). In contrast Dishman et al. (2004) found that outcome expectancies failed to have a direct effect on physical activity participation. D. M. Williams et al. (2005) stated that outcome expectancy constructs are described and operationalized in different ways across many different theories. In taking those various approaches to measurement into consideration, D. M. Williams et al. asserted that the general conclusions are that positive outcome expectancies are stronger predictors of physical activity among older adults than younger or middle-aged adults. Barriers to physical activity are sometimes included as a subtype of negative outcome expectancies and tend to be the strongest correlate of physical activity within negative outcome expectancies. D. M. Williams et al. suggested that this finding may be in part due to failing to measure the expectancies most relevant to the age group in question, and also the failure to measure the outcome expectancies of alternative behaviors (such as being sedentary).

As operationalized in the TPB, Godin and Kok (1996) found that attitude was a stronger predictor of exercise than subjective norms. However, more recently, Giles-Corti and Donovan (2002a) found that attitudes did not significantly contribute in the final explanatory model of their study. Chatzisarantis and Hagger (2005) argued that most studies utilizing the TPB aim at improving all of the underlying constructs in order to change the level of intention. Whereas their (2005) study focused solely on the relationship between attitude and intention so that its mechanisms could be more clearly understood. Two types of persuasive messages (one salient and one nonsalient) were administered. The salient message had a significant influence on attitude and a reduced impact on intention and activity behavior due to the indirect pathway, acting on those variables through the change in attitude. They suggested that their finding supports other studies (Hagger, Chatzisarantis, & Biddle, 2002) demonstrating attitude to be additive in increasing intention when paired, as the model suggests, with perceived control. Jackson, Smith, and Connor (2003) also found attitude to be a significant predictor of intentions, and intentions are the key element of the TPB model (Chatzisarantis & Hagger, 2005).

Perceived norms as conceptualized in the IBM include two types of normative influences: injunctive and descriptive norms. Injunctive norms are those things that individuals perceive their referent group thinks they should do (Lapinski & Rimal, 2005), whereas, descriptive norms refer to what the individual perceives is actually done within their referent group (Lapinski & Rimal, 2005). Normative beliefs as operationalized within TPB (typically injunctive only) have repeatedly been found to not strongly correlate with physical activity (Bauman et al., 2002) and exercise (Godin, 1993). Furthermore, Giles-Corti and Donovan (2002a) found that positive subjective norms were inversely related to meeting activity recommendations, which is counter to what would have been theoretically expected. The genesis of norms as a construct is the TPB.

Clearly, the norms construct within the TPB has had limitations in its ability to predict and explain participation in exercise.

Godin (1993) suggested that subjective norms have been unreliable predictors of exercise at best, but one reason could be how the construct is operationalized for research in this area. Nonetheless, when subjective norms were found significant, they were a weaker correlate of exercise behavior than attitude (Godin, 1993). Godin and Kok (1996) published a comprehensive summary of TPB studies applied to the exercise context. However, because it was published some time ago, it was prior to the theoretical revisions leading to the IBM. Within the research reported in the literature, the constructs are operationalized as simply injunctive norms as applied to exercise rather than containing injunctive and descriptive norms and a wider concept of physical activity.

As originally operationalized, subjective norms are positively associated with forming the intention to be active, a finding that is supportive of the gap between intention and behavior (Giles-Corti & Donovan, 2002a). This correlation is a weaker prediction of intention than the other constructs of attitude and PCB (Jackson et al., 2003). Additionally, some evidence exists that perceived norms may differ between genders, and that females may feel more motivation to comply with referent beliefs or opinions.

Booth et al. (2000) found the only social reinforcement variable with a significant relationship to physical activity participation, among their sample of older Australians, was friends or family advocating that physical activity was good for physical appearance sake. These findings support other findings that indicate there may be some support for normative beliefs forming normative motivations. One such study found that college-aged women may be motivated to engage in physical activity for body related reasons (weight control, tone;

Kowalski, Crocker, & Kowalski, 2001), which might direct thinking toward questioning the extent to which body image related beliefs or social physique anxiety might impact physical activity behaviors through social norms. Kowalski et al. (2001) found that social physique anxiety did not correlate with physical activity for college women. However, they do suggest that a failure to measure a direct effect does not infer that social physique anxiety would not affect behavior during participation in activity.

Baker et al. (2003) suggested that norms, when operationalized as injunctive and descriptive (as in the IBM), do play an important role in adolescent activity decisions through influencing attitudes, and subsequently intentions and behavior. Referent group effects were measured separately, and male adolescent activity behavior was directly influenced by peer referent norms (injunctive norm), whereas there was not such an effect for females. Additionally, it appears that when parental influence is the referent group, their strongest influence on adolescent activity behavior is that of social modeling (descriptive norm).

Social modeling of physical activity (seeing people being active in the neighborhood) has been positively associated with higher levels of physical activity (Ainsworth et al., 2003). Participation of friends and family has also been shown to increase participation (Booth et al., 2000; Brownson et al., 2001). In order for social modeling or descriptive norms to be effective, the individual must identify with the referent group in order for their behaviors to be influential on the individual's intentions and behavior (Lapinski & Rimal, 2005).

The construct of personal agency is comprised of self-efficacy and PBC. Jackson et al. (2003) found that self-efficacy was a stronger more effective variable in predicting intention than PBC. Further, Jackson et al. suggested that before an intervention can address perceived control of the outcome behavior it must first overcome all of the barriers the individual perceives.

Bozionelos and Bennet (1999) found that exercise was predicted by attitude, intention, and PBC. Similarly, PBC was found to predict both intention and physical activity (behavior) among children (R. Rhodes, Macdonald, & McKay, 2006).

One recently published study focusing on PBC, intention, and physical activity behavior indicates that PBC has garnered inconsistent support as a moderator of the intention–behavior relationship (Amireault, Godin, Vohl, Perusse, 2008). This study found that intention and PBC both significantly predicted physical activity; however, when past behavior (habit) was added to the model, PBC was no longer significant. In testing moderation effects of the intention–behavior relationship, PBC, income (higher income, stronger intention–behavior relationship), and age (older age, stronger intention–behavior relationship) were all significant predictors. Income remained significant as a predictor in the PBC-physical activity relationship (Amireault et al., 2008).

Dzewaltowski, Noble, and Shaw (1990) conducted a comparison of TPB and SCT. They found that attitude and PBC predicted intention, which in turn predicted physical activity. The strongest contribution to the prediction of physical activity, however, came from the SCT variables of self-efficacy and self-evaluation of behavior. Hierarchical regression showed that PBC did not account for any additional variation in physical activity beyond self-efficacy. Although the strength and relationship between PBC and intention or behavior might be in question, personal agency's other construct of self-efficacy has earned more consistent support.

Self-efficacy of exercise has demonstrated itself to be one of the strongest correlates of exercise behavior, a consistent predictor of both the intention to exercise and the participation in exercise behavior (Sherwood & Jeffery, 2000), and predicting the intention to be physically active (Jackson et al., 2003). Self-efficacy is commonly measured as the efficacy to overcome

barriers, but it is defined as being the confidence one has in his or her ability to perform the course of action to successfully participate and satisfy situational demands (Sherwood & Jeffery, 2000). Others defined it more simply as an individual's confidence regarding participating in certain types or amounts of activity (Lewis et al., 2002).

In one of few controlled trials of self-efficacy, Dishman et al. (2004) found that increased self-efficacy directly resulted in an increase in physical activity participation among White and Black female adolescents. African American women with higher self-efficacy scores were 2 times more likely to attain recommended activity levels than women with low self-efficacy (Ainsworth et al., 2003). As mentioned previously, the relationship of self-efficacy to physical activity is impacted by general demographic variables such as age and gender (Netz & Raviv, 2004) by specific activity.

Some evidence exists for self-efficacy functioning as a mediator of physical activity behavior (relationship between theory or model is attenuated when self-efficacy is controlled for); these findings are not, however, entirely accepted. Self-efficacy is known to influence physical activity but whether it can actually qualify as a mediator is unclear (Lewis et al., 2002). Although it may not be established as a causal element in physical activity intention, it has shown to be progressively important for the adoption of activity behavior (Bauman et al., 2002)

Lastly, some research supports the influence of past behavior on being physically active in the present or future. This, however, is not true for all age demographics. For example, Bauman et al. (2002) found that activity during childhood has demonstrated a repeated lack of association with adult activity levels; whereas, the same study found that activity at previous times during adulthood was positively associated with adult activity rates. Sherwood and Jeffery (2000) supported those findings and further suggested that a history of physical activity helps

build activity skills and self-efficacy and should positively influence future participation in physical activity. Yet, they caution that findings are mixed depending on how exercise or activity is defined and measured.

### *Physical Activity and Subjective Well-Being*

The relationship between physical activity and subjective well-being is not clearly defined, but there appears to be evidence of a consistent relationship between the variables (McAuley et al., 2000). The investigation of this relationship often revolves around older populations and psychological well-being, although subjective well-being generally represents a perspective that is inclusive of psychological health, positive affect, and satisfaction with life. One such study of older adults found that physical activity was positively associated with improvements in subjective well-being regardless of type of activity. The association of activity and well-being was also augmented by an increase in social support for activity (McAuley et al., 2000).

The positive influence of physical activity on mental well-being for both clinical and nonclinical research has been gaining support in the recent decade. Fox (1999) suggested that physical activity and exercise have gained sufficient evidence to be considered for clinical application in the treatment of clinical depression, as well as a strategy for the avoidance of clinical depression. Additionally, activity and exercise have been linked to decreased state and trait anxiety, improved quality of life, mood states, and self-perception. Among older, well populations (those without clinical diagnoses), supportive evidence is available for the positive influence of physical activity on mental well-being, self-perception, and self-efficacy (Netz, Wu, Becker, & Tenenbaum, 2005). Physical activity has been less consistently associated with subjective ratings of good health across European countries (Rutten et al., 2001).

### *Gaps in the Literature*

Heretofore, research testing theories and conceptualizations of influences on physical activity have been effective in explaining only 20%-40% of the variance in activity participation at best (Spence & Lee, 2003). These findings have supported a call for broader more ecologic approaches to physical activity promotion (Spence & Lee, 2003). In congruence with this idea, the use of theory in research needs to be less restricted by the domain of exercise and more open to encompassing the broader concept of physical activity. Specifically, the IBM needs to be applied to physical activity behavior, and its constructs more broadly applied to all domains of activity (e.g., intention for self-transportation). Further, Owen et al. (2004) suggested the need for behavior domain-specific measurement (his study measured walking for recreation versus walking for self-transportation). Less reliance on exercise classes for university students would also be a welcome improvement.

Rutten et al. (2001) suggested that there is a dearth of attempts to contextualize physical activity in reference to environmental and policy conditions. The present study is a step in that direction by attempting to connect the important consumer social milieu and theory to activity behaviors. This attempt is similar in some ways to the relatively recent growth of investigations of spirituality (context) to physical activity behaviors (Seefeld et al., 2002).

### Literature on Materialism

#### *A Description and Overview of Materialism*

Richins and Dawson (1992) explained that the origin of the term *materialism* is philosophical in nature. The term materialism, however, has entered into the popular vernacular with a very different meaning. The popular interpretation of the term materialism centers around the importance of having material possessions, the pursuit of material possessions and wealth,

possession defined success, and acquisition as the pursuit of happiness (Richins & Dawson, 1992). According to Richins and Dawson, values-based materialism is derived from the constructs of centrality (the attachment and importance of possessions to the individual), happiness (the belief that happiness can be achieved through material attainment), and success (peer or normative comparison: one can be judged by their possessions; Richins, 1994; Richins & Dawson, 1992).

A second value theorist, Inglehart, worked from Maslow's Hierarchy of Needs and suggested that materialism is the chronic over-focus on lower order needs for material comfort to the extent that it causes higher order needs (belonging, self-expression, and quality of life) to suffer (Ahuvia & Wong, 2002). Inglehart divided materialistic value systems into materialists and postmaterialists. Materialists are those who focus on lower order needs (survival), whereas postmaterialists place great importance on higher order needs even at the cost of financial rewards. It is not that postmaterialists reject the idea of wealth, they simply value it at a lower level than nonmaterial needs and satisfactions (Ahuvia & Wong, 2002; Inglehart & Baker, 2000). Inglehart and Baker attributed this shift toward emphasis on quality of life and subjective well-being to the affluent life of industrially advanced society. Essentially, entire generations have grown up taking survival for granted.

#### *The Development of Materialistic Values*

Given the widespread and increasing presence of materialism and consumption among all populations, there has been a need for a better understanding of how individuals develop such beliefs. Historically, the development of materialistic attitudes and beliefs has been evaluated either in terms of personality traits or values systems (Ahuvia & Wong, 2002). Ger and Belk (1996) saw materialism as a set of personality traits that are specified as envy, nongenerosity,

possessiveness, and preservation. These constructs are said to arise out of emotional responses to developmental experiences (Ahuvia & Wong, 2002). Belk's approach of personality materialism varies from other researchers who view materialism as being value based (Ahuvia & Wong, 2002). The present study takes the perspective that materialism is a part of an individual's values system.

Inglehart believed that value orientations develop as a cognitive construct out of formative experiences of affluence or deprivation (Ahuvia & Wong, 2002; Inglehart & Baker, 2000). Persons that experience periods of economic insecurity during their childhood and adolescence develop a focus on security that stays with them into adulthood. Conversely, persons that have grown up in an economically secure environment are more likely to develop a postmaterialist perspective (Ahuvia & Wong, 2002; Inglehart & Baker, 2000). Some would suggest that money is worth only what it can purchase; however, in the case of materialism, money becomes its own reinforcement (Briers, Pandelaere, Dewitte, & Warlop, 2006). People aspire to have money without a clear plan of what to do with it. Deprivation driven materialism has been shown to have connections to various health topics, namely eating behaviors and food security (Briers et al., 2006).

Chang and Arkin (2002) similarly found that materialistic values flourish in the face of uncertainty. Persons were found to turn toward materialistic orientations when they experienced uncertainty with themselves (self-doubt) or with society at large (anomie, normlessness). Self-doubt and anomie increase the likelihood that a person defines success by acquired material assets and increase the belief that acquiring material goods are essential elements in the pursuit of happiness. They do not, however, predict the perception of material centrality to life (Chang & Arkin, 2002), as Richins would suggest (Richins & Dawson, 1992).

It is also suggested that values systems are influenced by the “social milieu” in which a person grows up (Ahuvia & Wong, 2002; Inglehart & Baker, 2000). The term *social milieu* is used to express the influences of key socializing agents such as peers, modeling, and media upon the values internalized by an individual while they are growing up (Ahuvia & Wong, 2002; Inglehart & Baker, 2000). Also, although there is a general acknowledgment of the media’s potential influence as a part of the formative social milieu, Inglehart’s theory does not attempt to measure that influence in any way and instead measures only familial and social group influences (Ahuvia & Wong, 2002). This is a large oversight given the development of the electronic dependence of the recent decades.

Ahuvia and Wong (2002) sought to compare and contrast the origins of materialism as defined by Belk, Richins, and Inglehart. The findings indicate a developmental path between social milieu and both personality and values materialism. These findings are in congruence with those of Banerjee and Dittmar (2008), who found peer influences through expectations, rejection, and modeling and generated meaningful social motives for developing a materialistic orientation. This indicates the importance of social influences on values-based materialism and supports the theoretical direction taken in the present study.

Durgee, O’Connor, and Veryzer (1996) pointed out that marketers have long been interested in consumer values. Marketers seek to understand consumer values in order to translate them into commodities (for example: value of good health—exercise—exercise equipment) and subsequently convert them into “needs” within society. Often these needs play into the consumer demand-perceived prestige relationship (Braun & Wicklund, 1989). This relationship has also been characterized as the “Veblen-effect” (Thorstein Veblen coined the term *conspicuous consumption*), bandwagon effect, or the snob effect (Braun & Wicklund,

1989). Materialism is crossing from the pursuit of material goods to defining the individual and the enhancement of the person. Thereby the function of marketing becomes not just to make us dissatisfied with what we have, but also with what we are (Eckersley, 2006).

### *Conspicuous Consumption*

Conspicuous consumption is described as using expensive possessions or activities to demonstrate wealth in a noticeable way (Shukla, 2008). Conspicuous consumption in the social context symbolically represents prestige and may garner a psychological advantage to consumption (Shukla, 2008). Specific psychological antecedents have been shown to be present in conspicuous consumption: primarily the need for uniqueness and yet conformity. The need for uniqueness is the desire of an individual to set themselves apart by owning material goods that are different or that others have not yet attained. Conformity relates to one's position within the social hierarchy, and utilizing material goods to improve one's position through social approval (Shukla, 2008).

Fitzmaurice and Comegys (2006) suggested that materialistic attitudes are associated with being motivated for social consumption, that is motivated by status or image portrayed through the items. Social consumption motivation is often rooted as a coping mechanism for dealing with feelings of ambiguity or low self-esteem, as well as for enjoying increased social status "proven" through ownership and the ability to serve as influential sources of product information (opinion leadership) to others making purchase decisions. The job of proving oneself is continual through consumption (Fitzmaurice & Comegys, 2006).

Braun and Wicklund (1989) established a connection between one's insecurity and the tendency to use material symbols and prestige for identity. "A symbol can be regarded as any facet of the person that has the potential to signal to others (who understand the symbol as

related to the identity) that one possesses the identity in question” (p.164). Such symbols can be comprised of a wide variety of facets including language use, behaviors, or material objects. The strength of the symbol–identity relationship was predicted by lack of security in the identity domain and the commitment to attain that identity. For example a high school junior varsity basketball player may want to establish his or her identity as a serious player, using material goods (clothing, speech patterns, etc.) and participating in specific activities outside practice that would establish him or her as a basketball player. The individual’s lack of experience (JV status) and commitment to attain the identity (personal urgency) significantly increase the chance of using symbols to attain identity as a serious ball player. Chang and Arkin (2002) supported this approach, finding that when people felt inadequate in a domain, they tended to have or desire more material displays of that identity.

Belk (1988) supported the previous findings by stating that people often view possessions, experiences, and places as extensions of the self. These extensions can be physical (weapon) or symbolic (trophy). Perceptions of others’ affluence (by judging their extensions of self) strongly impact perceptions of success, ability (personal and interpersonal), sophistication, and having a more desirable lifestyle (Christopher & Schlenker, 2000).

As inferred earlier, those who have a weak sense or are still developing their sense of identity, such as adolescents, may be particularly prone to seeking identity through consumption and possession (Belk, 1988). Possessions have meaning to their owners, and it is this meaning that gives them value (Richins, 1994). The meaning of possessions is both public (society’s perception or value of the object) and/or private (an individual’s relationship to or sentiment of the object). The sources of the meanings may come from their utility, enjoyable use, how they

represent interpersonal ties, or their function as a source of identity and self-expression (Richins, 1994).

In general, a preponderance of literature intending to explain the development of materialism appears to be tied to poor satisfaction with basic human needs such as security, relatedness, autonomy, and identity. This finding has implications for the relationship of materialism to well-being (Kasser, 2002).

### *Materialism and Well-Being*

The study of well-being has a long legacy within literature and can be traced back to the work of Aristotle and others before him (Helliwell, 2003). In recent times, however, the study of well-being, and specifically psychological well-being, has fallen prey to the prioritization of the study of psychological illness. As the literature is once again returning to the topic, a few suggestions for determinants of subjective well-being include personality, human needs, social environments, and circumstances (Helliwell, 2003).

Diener and Biswas-Diener (2002) suggested that there are three main approaches to subjective well-being: the human nature approach, the cultural approach, and the relative standard approach. The human nature approach suggests that subjective well-being can be satisfied or improved through the meeting of one's biological needs, engagement in activities of interest, and the presence of social support. This approach finds subjective well-being to be more finitely controlled and less variable than the latter two approaches. The cultural approach suggests that the contributing factors of subjective well-being are varied and dependent on what the individual has learned regarding goals and values. In other words, individuals embrace the values of the society in which they are raised, and as long as they are participating in the socially sanctioned goal behaviors of that society then they are able to attain a sufficient level of

subjective well being. The relative standards approach invites even further variability by suggesting that goals and values change over time and are situation dependent.

Diener and Biswas-Diener (2002) continue by stating that the three approaches can be used in combination to explain the relationship between income and subjective well-being. People in America are socialized to work and participate in consumption activities. People that are successful at attaining these basic goals are slightly more happy, and most persons can participate in the goals to some level of enjoyment. These goals germinate from both human needs and from cultural and situational based norms and standards. In this way, persons who are able to establish incomes that allow them to meet their needs and some modicum of consumption are happier than those in poverty. The relationship to well-being is complex; however, in many cases as income increases so do situational goals for consumption. In this way, it is the development of goal content that is in question and of the most relevance (Deci & Ryan, 2000; Grouzet et al., 2005). When goals become out of sync with either the ability to achieve them or come in conflict with meeting basic human needs (maintaining personal relationships, social support), there is a decrease in subjective well-being.

Diener and Biswas-Diener (2002) suggested that cultures that have a more stable sense of goal content decrease the relevance of income to subjective well-being; for example Amish communities, where materialistic values are restricted. In an investigation of adolescent girls' goal content and pursuit, Massey, Gebhardt, and Garnefski (2008) found that goal content can be influenced by a variety of sociodemographic and psychological factors and is associated with adolescent behavior, health, and well-being. There are many challenges to well-being among adolescents (Luthar & Latendrese, 2005). This is particularly true of affluent adolescents, including immense pressure to achieve, issues of appearance and popularity, and the possibility

of task failures being interpreted as personal failure. Additionally, there are some indications that young adolescents that experience either socioeconomic extreme of wealth or poverty both showed signs of relatively high levels (10%) of behavior disturbance across multiple domains, which impedes their success in the classroom (Luthar & Latendrese, 2005).

The idea that a materialistic world view can influence a person's well-being is not a new one, and contemporary researchers are quick to acknowledge the work done by early theorists such as Rogers, Maslow, and Fromm (Kasser & Ryan, 1993). Kasser and Ryan investigated the impact of holding financial success as a dominant life goal on a person's psychological characteristics. Their study was designed to build upon the early theorists, as well as Deci and Ryan, who suggested that reliance on extrinsic rewards or approval from others was correlated to lower well-being and psychological adjustment scores, and greater psychological distress. Kasser and Ryan's (1993) findings supported previous works. Persons who placed more emphasis on self-acceptance, affiliation, and community feeling experienced greater well-being (Chatzisarantis & Hagger, 2007) and less distress; whereas, the pattern was reversed for persons placing more importance on financial attainment. This study was among the first to utilize the Aspirations Index developed by Kasser and Ryan (1996; Schmuck, Kasser, & Ryan, 2000), which is discussed in more detail in chapter 3.

The ideologies of first-world consumer cultures are spreading quickly through global developing markets (Kasser & Sheldon, 2000), as systematic and predictable changes in culture and politics accompany economic development (Inglehart & Baker, 2000). Ideologies that suggest, often not so subtly, that an individual's worth is determined by his or her possessions and, for some, financially outperforming others is a method by which one gains self worth (Arndt,

Solomon, Kasser, & Sheldon, 2004). The unfortunate reality of these ideologies is they are connected to lower well-being and life satisfaction (Kasser & Sheldon, 2000).

There is considerable support for the position that materialism is negatively related to American well-being (Deci & Ryan, 2000; Kasser & Ryan, 1996; Srivastava, Locke, & Bartol, 2001). Materialistic values are also negatively correlated with values that are more self-transcendent (religion, selflessness; Eckersley, 2001). Materialism is associated with higher levels of stress and internal conflict among individuals with stronger collective value orientations. These conflicts of value can create a level of psychological tension and discord (Eckersley, 2001), which thereby leads to a diminished sense of well-being. It would be normal to presume that an individual would make changes to alleviate the tension of cognitive dissonance, yet value systems develop over the lifetime and are difficult to change, and the prevalence of materialistic values in contemporary American culture makes such change even more challenging. Still more work is needed to understand how the materialism–well-being relationship functions within the broader scope of other life values (Burroughs & Rindfleisch, 2002)

Srivastava, Locke, and Bartol (2001) found a negative relationship between importance of money and subjective well-being among business students. The relationship was explained as developing from the motives for social comparison, power seeking behavior, showing off, and attempting to overcome self doubt. When these motives were controlled for, the relationship between money importance and subjective well-being was not significant. The authors also found that financial aspirations were predominantly a function of an individual's self-efficacy to earn money rather than a motive. Additionally, they stated that, psychologically, materialism is an attempt to substitute financial gain for the “proper use of one's mind” (Srivastava, Locke, &

Bartol, 2001, p. 968), and that money seeking becomes very problematic when it is used as a replacement for something that it can not buy (love, etc.).

The development of need for constant consumption does carry with it implications regarding available resources and ecologically responsible behavior. Consumption has been negatively correlated with ecologically responsible behavior (K. W. Brown & Kasser, 2005). There is a popularly held belief that ecologically responsible behavior must come at the cost of personal happiness. Yet subjective well-being and ecologically responsible behaviors do not have to be at odds. Brown and Kasser (2005) found that subjective well-being and ecologically responsible behavior were positively correlated.

#### *Conceptualization of Materialism and Well-Being in the Present Study*

Kasser and Ryan published a study (1996) that delineated two broad life goal or value categories: extrinsic and intrinsic. Extrinsic goals are those that are contingent upon reward or approval from others, such as financial success (money), social recognition (fame), and appealing appearance (image; Grouzet et al., 2005; Kasser & Ryan, 1996). Extrinsic goals tend to be a means rather ends, as such they do not directly provide life satisfaction. Rather, extrinsic goal attainment is often presumed within American culture to provide admiration, power, and a sense of worth. Intrinsic life goals are items that tend to focus more on self-actualized principles and are therefore associated with the ability to meet basic human psychological needs (Kasser & Ahuvia, 2002; Kasser & Ryan, 1996). Intrinsic life goals include things such as self-acceptance, affiliation, and community feeling (Kasser & Ryan, 1996).

Kasser and Ryan (1996) hypothesized that lower ratings of psychological well being and higher ratings of distress would be associated with extrinsic aspirations when they are central guiding principles in one's life. The study found that the overall value or importance placed on

extrinsic goals was associated with significantly more vitality, narcissism, and negative affect. After controlling for the overall score, the relative importance of intrinsic goals was associated with higher self-actualization (Chan & Joseph, 2000; Kasser & Ryan, 1996), and less depression, narcissism, physical symptoms (Kasser & Ryan, 1996), and happiness (Chan & Joseph, 2000; Kasser & Ahuvia, 2002). Conversely, extrinsic goals were associated with more depression, narcissism, physical symptoms, and less self-actualization. In addition to the value an individual places on a goal, self-rated likelihood of attainment (self-efficacy) of extrinsic goals was associated with significantly less vitality, self-actualization, positive affect, and with significantly more anxiety, depression, and narcissism (Kasser & Ahuvia, 2002; Kasser & Ryan, 1996).

Some possible explanations for these findings were discussed by Kasser and Ryan (1996). First, it is possible that extrinsic aspirations represent the presence of a general neuroticism or emotional insecurity among those with dominant extrinsic goal value systems. This explanation is supported by the findings of Kasser, Ryan, Zax, and Sameroff (1995), which purport that young adults may develop extrinsic value orientations and related insecurities as a result of early life experiences (less nurturing mother, disadvantaged socioeconomic circumstances). These findings are similar in thought to those discussed previously regarding early deprivation. A second potential explanation is persons that have strong extrinsic value orientations may be more likely to engage in activities that support those driven, ego involving, and controlled behaviors. The final explanation presented by Kasser and Ryan (1996) is that extrinsic goals may be more difficult to attain and provide an endless cycle of striving for “more” (Diener & Biswas-Diener, 2002), thereby creating an experience of failure in achievement of goals, which can lead to negative psychological effects. Other research concurs, stating that

extrinsic aspirations (seeking external signs of approval and worth) are less likely to help an individual reach direct need satisfaction and may in fact distract from attaining it (Deci & Ryan, 2000); whereas other goal content (intrinsic goals) is more likely to be associated with attainment of basic need satisfaction (Deci & Ryan, 2000).

An additional negative side effect of extrinsic values is the constant involvement and concern for the self. When people become too focused on themselves and their own needs they experience “public self-consciousness” or a hyper-awareness of how they appear to others (Kasser, 2002). The self-consciousness erodes the individual’s ability to be present in the moment, to participate in the challenges and enjoyment of whatever they are doing (Kasser, 2002). As people perceive pressure to behave in a given way, they give away their ability to make choices autonomously. This lessening of autonomous choice offers a strong explanation for why persons with materialist perspectives are less happy. This ever-present pressure of projecting the right image leads to the objectification of people. One commonly referenced example is that children become economic appendages of their parents that need to be controlled in order to present the right image and less like individuals in need of nurturance and guidance (Kasser, 2002).

The degree to which image, and thereby social acceptance, is related to media influences is not clear, although materialistic people tend to watch more television (Engle & Kasser, 2005). Similarly, participants who valued self-care before care for others, high incomes, and nice possessions had higher television consumption habits (Harmon, 2001). Although the link between media consumption and materialism is not clearly understood, the pervasive exposure to the media in contemporary culture suggests that media could potentially play an influential role in the development of lifestyle expectation norms and materialism (Harmon, 2001).

## The Relationship of Health Behaviors to Materialistic Values

Materialism and extrinsic values have not been examined directly in connection to physical activity, however, there is some evidence of a relationship to other health behaviors and risks. Eckersley (2006) argued that materialism and individualist orientations (rather than collectivist) are deleterious to health and well-being via their influence on psychosocial factors like social support and personal control. Further, it has been argued that research into the social determinants of health (such as materialism, and individual as well as societal values systems) has neglected, in favor of socioeconomic factors and research regarding inequality, other factors such as an increase in consumer behavior and culture (Eckersley, 2001).

Research has suggested that Western society's expectations for attractiveness, especially among women, and specifically regarding thinness, can encourage women to engage in less healthy behavior in order to try and attain a projected cultural norm (Arndt et al., 2004). Bessenoff and Snow (2006) found that not only is there an injunctive cultural norm to be extremely thin, but that women use this as a standard by which they set their own personal weight ideal. The majority of women put their own ideal to be higher (thinner) than that of the cultural expectation, which can lead to the feeling that it is impossible to meet the standard.

A study focusing on adolescent health risk behaviors found that adolescent use of tobacco, alcohol, and marijuana and their having engaged in sexual intercourse was significantly predicted by their extrinsic value orientation (G. Williams, Cox, Hedberg, & Deci, 2000). As students progressed through school, the relationship between value orientation and health risk behavior became stronger. Additionally, adolescent health risk behaviors and value orientations were significantly predicted by their perceptions of parental support for autonomy. Extrinsic

values partially mediated the relationship between perceived parental support for autonomy and health risk behaviors (G. Williams et al., 2000).

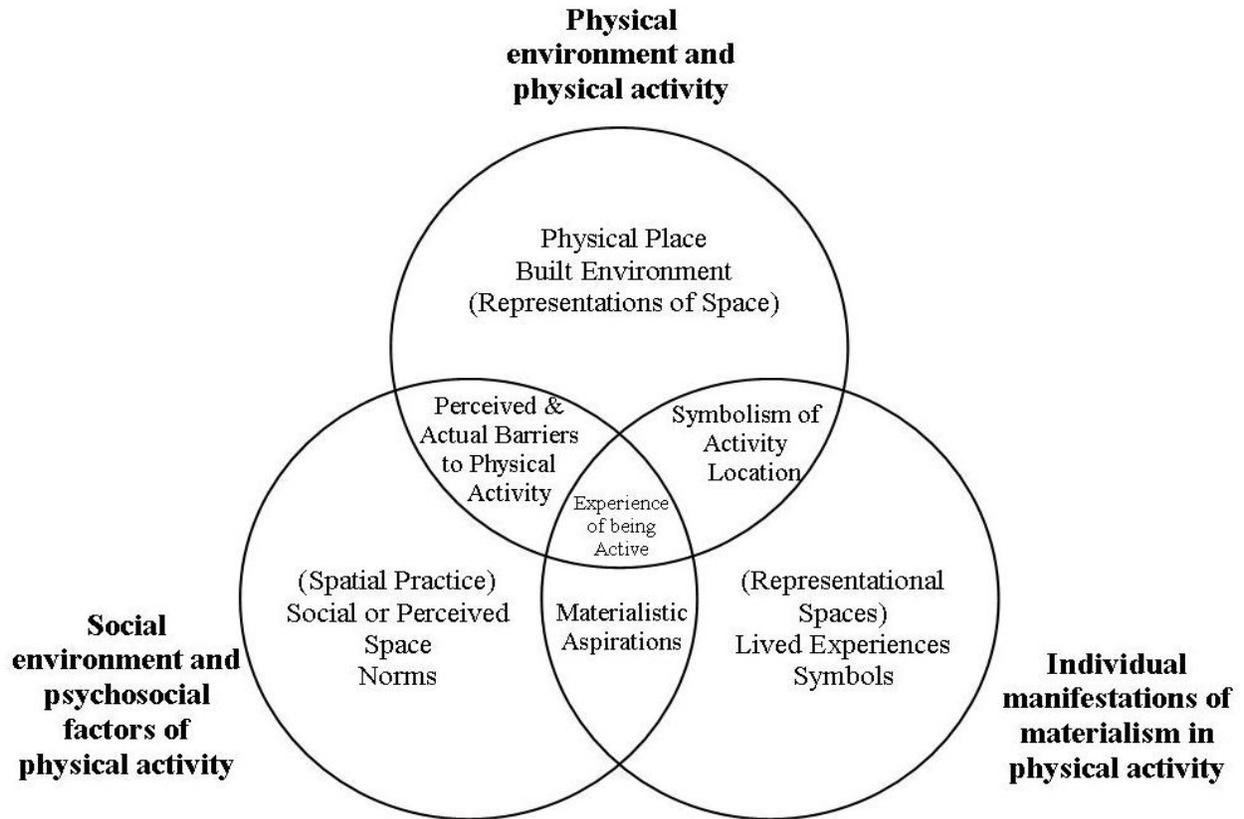
And finally, Chatzisarantis and Hagger (2007) found that importance ratings of life aspirations mediated the relationship between participation in sports and psychological well-being. Attainment ratings of life aspirations were not found to have a mediating effect. Further, individuals participating in recreational sports were more likely to prefer intrinsic values and have better ratings of psychological well being. The authors suggested that recreational sport is an avenue for expressing ones goals and values through participation (Chatzisarantis & Hagger, 2007). These findings appear to be congruent with the previously discussed topics of image and social identity.

#### The Confluence of Physical Activity and Materialism

This chapter establishes the body of literature regarding the impact of the physical (built) environment as a facilitator and barrier of physical activity as well as social environmental and psychosocial variables' relationship to physical activity. Both bodies of knowledge lend a solid foundation for a more inclusive description of the interaction of physical place, social space, and physical activity.

Lefebvre (2001) utilized a triad to provide a more inclusive description of the production of space. The components of the triad include spatial practice (social or perceived space), representations of space (conceived or built environments and spaces), and representational spaces (lived experience, embodied space, and the symbols associated with it). These constructs are dynamic and cannot, in the purest sense, be individuated from one another. The present study uses the idea of this triad to investigate the interaction between the physical environment, social environment, and materialism in physical activity as illustrated in the Venn diagram (Figure 2).

Figure 2 demonstrates the conceptualization of the interaction between the physical environment, social environment, and the manifestations of materialism as they appear in physical activity based on Lefebvre's triad and the authors understanding of the physical activity literature. The top circle represents the physical environment where physical activity takes place. The physical environment overlaps with the symbolic representations of materialism to form the symbolism of the activity location (why and how locations are selected, and what they mean). Physical environment also overlaps with social environments leaving a space that represents the barriers and facilitators (both real and perceived) of physical activity. Social space and symbols of materialism overlap, creating a space that represents the aspirations for materialism, a space influenced by culture and norms and also how one aspires to symbolically represent oneself. Finally, the very center area of the diagram, an area influenced by all of the three larger circles, is experience of being active. Each person participating in physical activity has an experience of it (be it positive or negative) that adds to their cumulative experience with physical activity participation. The dynamic interaction of materialism, social norms, and location as shown in Figure 2 is discussed further in chapter 5.



*Figure 2.* The dynamic interaction of the physical environment, social environment, and the manifestations of materialism as they appear in physical activity.

## CHAPTER 3

### METHODOLOGY

Data for this dissertation was collected from students at a large public university in the southeastern United States. The methodology used in this dissertation employs both quantitative and qualitative means of understanding the influence of materialistic values on physical activity participation, location, and experience. The quantitative survey instruments were used to establish value orientation as well as physical activity participation level into four categories: extrinsic values of those physically active, extrinsic values of those not physically active, intrinsic values of those physically active, intrinsic values of those not physically active. The quantitative survey instruments are discussed in further detail later in this chapter. The qualitative portion of this dissertation involves the use of focus groups to provide a deeper understanding of materialistic values and physical activity by conducting focus groups that are homogeneous in their values orientation and activity level. This methodology section details the rationale for the study design, development of the qualitative survey instrument, sample selection, development of the qualitative focus group guide, as well as a timeline.

#### Approval from Institutional Review Board

A proposal was approved by the Institutional Review Board (IRB) at the University of Alabama (UA). The approved IRB paperwork is provided (Appendix A).

#### Identifying and Sampling Participants

After IRB approval, the quantitative instruments were piloted with a small group of health education graduate students that did not participate in the study. The instrument was

piloted for readability, comprehension, face validity, and to more closely estimate the amount of time for completion. Once pilot feedback information was received and changes to the instrument approved by the committee and the IRB, the study was published to the online source in its final form.

### Quantitative Methods

Several instruments were implemented in the quantitative portion of this dissertation: the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985); The Global Physical Activity Questionnaire (World Health Organization; Armstrong & Bull, 2006); The Aspiration Index (Kasser & Ryan, 1996; Schmuck, Kasser, & Ryan, 2000), General Self-Efficacy (Chen, Gully, & Eden, 2001), Self-Efficacy of Exercise (Marcus, Selby, Niaura, & Rossi, 1992), a measure of physical and mental health taken from the Behavioral Risk Factor Surveillance System, Social Support for Exercise (Prochaska, Rodgers, & Sallis, 2002), several items developed to measure theoretical constructs of the Integrated Behavior Model using the instructions from Fishbein, Triandis et al. (2001), and finally a few items newly developed to measure perceived financial responsibility.

The Satisfaction With Life Scale (SWLS) was developed to provide a global measure of life satisfaction (Diener et al., 1985). The scale was developed by one of the leading researchers in the field of subjective well-being. The scale has been validated with college student populations and found to have acceptable psychometric properties such as high internal consistency and temporal reliability. It has a low correlation score (.02, Marlowe-Crowne measure) for social desirability responses. Additionally, the SWLS has been shown to highly correlate with other measures of subjective well-being (Diener et al., 1985). The measurement of subjective well-being has not only been connected to materialism, it has also been used as an

outcome variable in studies of physical activity (McAuley et al., 2000; McAuley et al., 2006). By including life satisfaction to represent the attitude construct it was reversing the direction of the relationship as it has been studied with physical activity and materialism. Physical activity and materialism are usually considered the predicting variables, and SWL the outcome. However, given the relationship with both variables it was essential that SWL was included in some analyses.

The Global Physical Activity Questionnaire (GPAQ) was developed by the World Health Organization (WHO) for physical activity surveillance across the globe (Armstrong & Bull, 2006). One specific attribute of the instrument that separates it from other physical activity instruments is that it measures the domain of activity (work, self-transportation, and recreation) as well as sedentary behaviors. The GPAQ was used to assess self-reported moderate and vigorous physical activity during a typical week. The instrument was derived from the International Physical Activity Questionnaire (IPAQ) short and long forms (Trinh, Nguyen, Dibley, Phongsavan, & Bauman, 2008). The GPAQ permits domain-specific MET minutes to be calculated (Abu-Omar & Rutten, 2008; Bauman & Craig, 2005) using the values from the Compendium of Physical Activities (Ainsworth et al., 1993). The metabolic equivalent (MET) is frequently used to assist in the determination of intensity of physical activity. A MET is a widely utilized method for expressing energy cost of various physical activities as a multiple of the resting metabolic rate (Byrne et al., 2005) and is discussed in more detail in chapter 2.

GPAQ test-retest reliability resulted in an acceptable correlation of  $r = 0.67 - 0.81$ . Concurrent validity when compared with the IPAQ resulted in good correlation scores for total physical activity ( $r = 0.54$ ) and sedentary behavior questions ( $r = 0.65$ ) (Armstrong & Bull, 2006). Haskell et al. (2007) established that when combining moderate and vigorous activity to

come up with a weekly MET minute total the minimum goal should be within the range of 450 MET minutes to 750 MET minutes per week. Additionally, some information is available as to what domains the activity is occurring in.

The materialism instrument used in this study was the Aspiration Index (Kasser & Ryan, 1996; Schmuck, Kasser, & Ryan, 2000). The original version of the Aspiration Index was developed in 1992 (Kasser & Ryan, 1993) and a newer version of the Aspiration Index can be found in Grouzet et al. (2005). Though there is a newer version of the Aspiration Index, the present study uses the 1996 version which has been used previously on the college student population (Kasser & Ryan, 1996; Schmuck, Kasser, & Ryan, 2000). The newest version of the Aspiration Index has 11 subscales, some of which are not particularly salient to the study at hand (e.g., hedonism, safety; Grouzet et al., 2005), and given the need to limit instrument size it was determined that the 1996 version was a better fit for this study. Subscales included in this instrument are self acceptance (growth), affiliation (relatedness), community feeling (helpfulness), physical fitness (health), financial success (money), attractive appearance (image), and social recognition (fame/popularity) (Kasser & Ryan, 1996; Schmuck, Kasser, & Ryan, 2000).

The scale used to measure general, or global, self-efficacy was the New General Self-Efficacy scale (Chen, Gully, & Eden, 2001). This version of a generalized self-efficacy scale demonstrated higher levels of content validity than previous available versions, however, the authors question if it was deficient in measuring the entire breadth of the domain of self-efficacy (Chen, Gully, & Eden, 2001). For this reason, it was paired with an instrument used to specifically measure the self-efficacy of physical activity. Reliability scores for internal

consistency were ( $\alpha = .86$  and  $.90$ ), and test-retest scores show that the instrument was moderately stable ( $r = .67$ ).

The scale selected to measure self-efficacy as it relates to physical activity was the Self-Efficacy of Exercise (Marcus et al., 1992). This instrument has one general prompt question: “I am confident I can participate in regular exercise when:” which was followed by five items such as “when I am tired,” and so on (Marcus et al., 1992). The present study was not interested in the measurement of exercise self-efficacy but rather physical activity self-efficacy, and therefore physical activity was substituted for exercise in the prompt question. The substitution of the term *physical activity* for exercise has previously been used in research by Umstattd et al. (Umstattd, Saunders, Wilcox, Valois, & Dowda, 2006; Umstattd, Wilcox, Valois, & Dowda, 2008). Self-efficacy has been shown to be one of the most consistent correlates of physical activity (Troost et al., 2002), and therefore it was essential that it be included in this study.

Several different approaches for measuring physical and mental health were considered. With instrument size limitations, and considering the licensure and measurement properties of the available instruments, it was concluded that the most parsimonious instrument that was the best fit was to select four questions from the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System Survey (BRFSS) questionnaire (2008). The questions selected (1.1, 2.1, 2.2, 2.3) are general questions regarding health status and health-related quality of life (CDC, 2008d). The same four BRFSS health status questions have been used previously (Booth et al., 2000) to establish a relationship between recommended activity levels and health related quality of life (D. W. Brown et al., 2003).

The scale selected to measure social support was the Physical Activity Social Support (PASS; Eyster et al., 1999). Social support is one of the few interpersonal, social factors that has

been shown to have consistent success correlating with physical activity (Prochaska et al., 2002; Trost et al., 2002). A review of related literature suggests that persons with low friend or family support for activity were 23%-55% less likely to reach recommended physical activity levels than those that had high levels of support to be active (Trost et al., 2002). Because this study seeks to be able to control for as many correlates of physical activity as possible, the measure of social support was included in the questionnaire. The social support construct was included as a part of injunctive norms.

Several of the remaining items of the survey were necessitated by the use of the integrated behavior model (IBM). It is clear that much of the new IBM is heavily derivative of the theory of planned behavior (TPB). Glanz, Rimer, and Viswanath (2008) recommended the use of the IBM, as it includes the TPB constructs in addition to influential constructs from other theories. IBM constructs not included as complete scales were formulated in keeping with Fishbein, Triandis et al. (2001) and the use of individual questions from other studies of physical activity research. They are as follows: PCB (Dzewaltowski et al., 1990; Giles-Corti & Donovan, 2003), attitude (Dzewaltowski et al., 1990; Giles-Corti & Donovan, 2003; Jackson et al., 2003), intention to perform behavior (Giles-Corti & Donovan, 2002a; 2003; Jackson et al., 2003), frequency of past attempts and behavioral skills (Giles-Corti & Donovan, 2003), self-identity and personal norms (Jackson, Smith, & Conner, 2003), barriers to physical activity (D. M. Williams et al., 2005), outcome values/outcome expectancies (D. M. Williams et al., 2005), and finally car ownership (Giles-Corti & Donovan, 2002b). Fishbein, Triandis et al. (2001) gave very detailed information on how to formulate questions for a survey in accordance with the IBM theory. The directions and sample questions were examined closely to ensure that the questions asked were within the parameters of the IBM theory.

The final component of the quantitative portion of the study was an attempt to measure the perceived financial responsibility and contribution of students in their own expenses. College student fiduciary responsibility is difficult to measure, and as such much of the literature on socioeconomic status and other economically related data has been derived from parental income. Thereby previous studies have used indirect measurement techniques rather than attempting to directly assess the extent to which students perceive they contribute financially to their expenses. These questions were newly developed for use with this study to represent common expenses encountered by college students such as tuition/fees, rent, other school expenses, food, gas, clothing, auto and renter's insurance, medical insurance, and entertainment. Additionally, follow-up questions were asked pertaining to their perception of spending as it related to lifestyle and their present and summer employment status as well as employment type. Following, Table 1 includes a summary of all of the instruments used in this study, the constructs they represented, as well as the number of items they included.

Table 1

*Summary of Survey Instruments*

Scale	Constructs	Items
Demographic Information*		12
Health Status (BRFSS)	Attitude/Perceived Health	4
Perceived Behavioral Control	Perceived Behavioral Control	3
Attitude Toward Trying Physical Activity	Experiential Attitude	3
Frequency of Past Attempts	Habit	1
Behavioral Skills Used in Last Month	Knowledge & Skills for Performance	1
Intention	Intention	1
Self Identity & Personal Norms*	Experiential Attitude/Descriptive Norms	8
Global Physical Activity Questionnaire*	Outcome Behavior	18
Aspirations Index*	Descriptive Norm	42
New General Self-Efficacy*	Self-Efficacy (General)	8
Self-Efficacy of Physical Activity*	Self-Efficacy (Domain Specific)	5
Determination to be Active	Intention	3
Barriers to Physical Activity*	Environmental Constraints	3
Physical Activity Social Support	Injunctive Norm	5
Outcome Expectancies	Outcome Values & Expectancies	6
Others' Expectations for Physical Activity	Injunctive Norm/Motivation to Comply	4
Social Modeling of Physical Activity*	Descriptive Norm/Motivation to Comply	4
Perceived Financial Responsibility*		15
	<i>Total Items</i>	<i>146</i>

\*Used for analysis in present study.

### *Quantitative Data Collection Procedures*

Following the approval of the IRB and dissertation committee members, the questionnaire was posted to the online source. The instructors of HHE 270 Personal Health and other large lecture courses within the College of Human and Environmental Sciences were contacted to solicit their assistance with the dissemination of the link. During the last week in January and the first week in February (January 26<sup>th</sup> – February 8<sup>th</sup>, 2008) the questionnaire was disseminated via the cooperating course. Campus wide identification (CWID) numbers were submitted with the questionnaires to ensure that no student completed the questionnaire more than once. The projected participation of this study was approximately 250 persons completing the questionnaire. All persons with student status were eligible to participate.

### *Quantitative Data Cleaning and Variable Recoding Protocols*

Prior to the initiation of any cleaning procedures, the data indicated a total sample size of  $n = 679$ . This number reflects all data lines that were initiated regardless of whether they were repeat submissions or had acknowledged the initial waiver page and subsequently exited the survey. The data file was saved in its original form and then resaved as another file for editing access in order to preserve an unaltered version of the dataset.

Data of participants who submitted more than one entry were cleaned using the following protocols: Data was downloaded into Excel and SPSS formats. Excel data were sorted by last name, first name, and CWID and then visually scanned for repeated names. Repeat cases were then highlighted. A list was printed containing only submission number and all names. SPSS data was sorted by “Identify Duplicate Cases.” Forty nine ( $n = 49$ ) duplicate cases were moved to the top of the file. Among duplicate cases are those that contained no information (entirely blank). There were 14 cases where the same respondent had submitted duplicate surveys

(response identifying numbers were 569, 633, 636, 655, 695, 715, 737, 756, 777, 800, 803, 822, 841, 847). All duplicate cases that contained data were then inspected. Preference in duplicates was given to the most complete data reported and earliest submission number. The SPSS function did not isolate all cases of repetition that had been located on the Excel sheet (additional cases had to be identified by scrolling through the data).

Participant age was recoded so as to retain all students that were 24 years of age or younger as of the first day of classes that semester. There were 58 students who were older than 24 years of age as of the first day of class. These students were retained in the dataset initially, however, once GPAQ and AI variables were cleaned and calculated (as discussed later in this chapter) an independent samples *t* test demonstrated that those over 24 were different in their activity and values from those of the target audience. Therefore, participants over the age of 24 were removed from the data set.

A summary SWLS was computed by adding the scores of the five related questions. Questions were scored from 1-7, and therefore the summary SWLS score had a possible range of 5 to 35, as per Diener et al. (1985). The mean SWLS score ( $n = 613$ ) was 26.58, and the histogram was slightly negatively skewed (-1.218); kurtosis was within a normal range (1.834).

The Aspiration Index was recoded and calculated as per the directions in Schmuck et al. (2000). All questions were recoded so that scores reflected a 1-7 range. Questions were rated by participants on both importance and likelihood; only importance scores were considered for this study. First, raw importance subscale scores were calculated by averaging the item scores for each of the seven subscales. An inquiry was sent to Dr. Kasser regarding singular missing values that create a missing subscale score when calculated in SPSS. Dr. Kasser indicated that as long as only one value was missing, it would be acceptable to average the score of the remaining

items to attain a valid subscale score (T. Kasser, personal communication, February 23, 2009). Items for each subscale were exported to Excel for examination. Any subscale missing more than one value was marked. Using the average function, new subscale scores were created. Subscale values where more than one value was missing were returned to missing variables as indicated by (.) in the data set. These new subscale scores were then imported back into SPSS in a column adjacent to the previous calculations for comparison. The new values matched the old ones except in the old cases where there was a missing value. The inclusion of scores that had previously been eliminated from analysis due to a missing value increased the number of participants from 471 to 554. Second, an average total importance score was calculated by creating an average score of importance combining all seven subscale raw scores. Third, mean corrected relative importance scores for each of the seven subscales was then calculated by subtracting the average total importance score from the raw subscale score. Fourth, summary intrinsic and extrinsic orientation scores were calculated by taking the average of the various intrinsic and extrinsic subscales. Lastly, a relative intrinsic orientation score was calculated by subtracting the summary extrinsic aspiration score from the summary intrinsic orientation score.

GPAQ data were cleaned as per the published protocols (Armstrong & Bull, 2006). The data points contained in each domain were examined for inconsistencies. The following protocols were employed. If the participant answered *no* to the initial prompt and followed with nonsensical scores (days = 1, hours = 1, minutes = 1), then the initial *no* was accepted and the subsequent responses within that domain were changed to zero. If the participant responded *no* to the initial prompt but had complete day/hour/minute data, then the initial response was changed to *yes*. Day/hour/minute variables following a *no* response were manually changed from missing to 0 so that they would be retained in the analysis. Responses that were initially *yes* but contained

incomplete data were changed to *no* and followed with zeros. Finally, missing data that were missing across the entire domain retained the missing data marker. Minutes of activity for each domain were calculated, and all domain minutes summed. Participants reporting more than 20 hours of average activity, or more than 24 hours of activity and sedentary time combined, were given a missing total METminute value so that they would not be included in the activity analyses. Domain METminute values were calculated by multiplying the reported average number of days of domain activity by domain minutes of activity by the assigned MET value (domain-days\*domain-minutes\*METvalue). According to the GPAQ guidelines, the assigned MET value for moderate activity is 4, and for vigorous activity it is 8. Sedentary domain totals were calculated similarly ([hours\*60]+minutes). Domain totals were calculated by adding the moderate activity totals to the vigorous activity totals of each domain. A total METminutes value was created by adding all of the domain METminute values. The Total METmins score was outside the normal ranges for both skewness (4.93) and kurtosis (39.16) and was therefore transformed by use of the square root as seen in Wilcox, Dowda, et al. (2006).

The New General Self-Efficacy Scale (NGSE; Chen et al., 2001) was recoded to correct the scale to read as a 7 point Likert scale with values ranging from 1 to 7. The eight items of the scale were then averaged to reach one final NGSE score. Similarly, a modified version of the Self-Efficacy for Physical Activity Scale (Umstatted et al., 2006; Umstatted et al.,2008) was calculated by correcting the scoring scale and creating one average score as per Marcus et al. (1992).

The Physical Activity Social Support (PASS) scale was calculated as per Eyler et al. (1999). Responses were dichotomized (0 or 1) and summed, which resulted in a singular scale score with a range of 0 to 5. Friend social support and family social support of physical activity

scores were also calculated. The PASS scale was divided into tertiles of support: low support (0-1), medium support (2-3), or high support (4-5) (Eyler et al., 1999).

Social norm and social modeling scales were calculated following the instructions given by Fishbein, Triandis et al. (2001). All related items were 7-item scales. The normative pressure was recoded to a scale ranging from -3 (*definitely should not*) to 3 (*definitely should*). There were two social norms, and two social modeling questions; each of the previous questions was followed by a motivation to comply question scored from 1 (*definitely don't want to be like*) to 7 (*definitely want to be like*). Perceived normative pressure and social modeling summary construct scores were calculated by summing the scores achieved by multiplying the initial response by the matching motivation to comply score.

As shown in Figure 3, respondents to the questionnaire were categorized into four subgroups for potential participation in follow-up focus groups. Quintile categories were established from the calculation of relative intrinsic orientation scores with each participant being located along a spectrum ranging from strong external orientation to strong internal orientation. Similarly, participants were also categorized into quintiles according to their accumulated METminutes of physical activity.

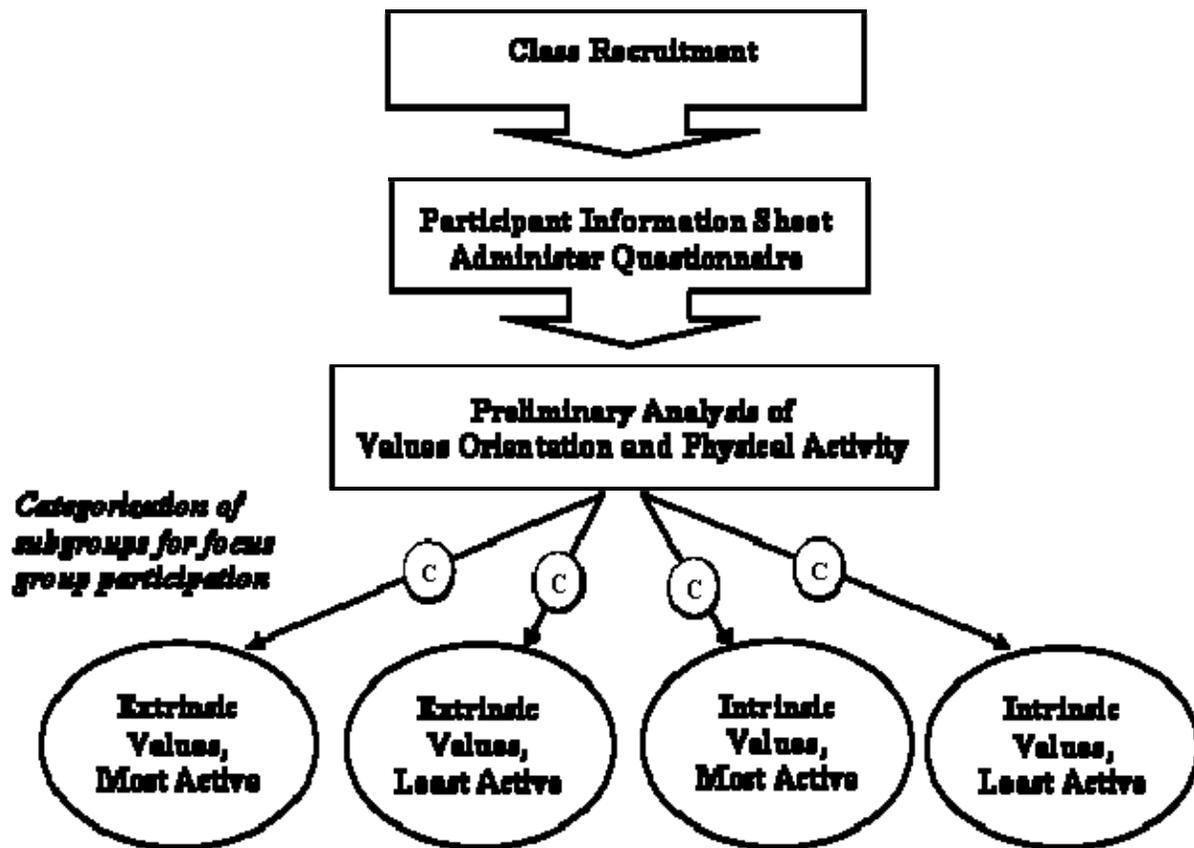


Figure 3. Study design diagram.

### Qualitative Methods

The driving idea for using focus groups in research was that group discourse can help participants explore their own beliefs and understanding of a given topic in a spontaneous and dynamic environment that would be more difficult to create in an individual interview setting (Kitzinger, 1995; McLafferty, 2004; Morgan & Krueger, 1998; Stevens, 1996). Focus groups can facilitate candid conversations about topics that might otherwise be too private or stigmatized. When group members discuss their own experiences they legitimize the similar feelings or experiences of other group members (Stevens, 1996). The group settings can provide a wider array of responses and details (Kidd & Parshall, 2000), gain insight into previously unexamined

or not thoroughly understood topics (Morgan & Krueger, 1998), encourage reflection and self-awareness among participants, as well as gain large amounts of data regarding a topic without knowing the precise questions that need to be asked (Morgan & Krueger, 1998).

Many social science disciplines rely heavily on focus groups (Smithson, 2000) to establish behavioral, social, and environmental context “norms” (Kitzinger, 1995; Morgan & Krueger, 1998). Although quantitative or epidemiologic research can establish trends and relationships between factors, often they do not do an adequate job of explaining or creating insight into attitudes and beliefs about the meanings or causations of those relationships (MacDougall & Fudge, 2001, McLafferty, 2004; Morgan & Krueger, 1998).

As the body of literature regarding physical activity and physical activity measurement has grown, it has led to understanding that physical activity is determined not only by an individual’s genetics and characteristics, but also by a dynamic interaction with factors like the social and physical environments (Sallis, J., Owen, N., & Fisher, E., 2008).

The study seeks to gain a better understanding of how personal values (materialistic aspirations) interact with subjective and personal norms and the physical environment to influence physical activity participation, location, and the experience of being active. In order to investigate these potential relationships, a more clear understanding must be developed of how materialism was demonstrated and perceived during physical activity as well as the relative importance placed on that variable by college students.

Although the study represents an initial query into a relationship that has not yet been thoroughly explored, occasionally inquiries do exist that can be tangentially related. One such study demonstrated a relationship between desire for money and desire for food (Briers et al., 2006). Many persons believe that more material wealth or object accumulation will increase their

happiness. However, the substantial body of literature presented in chapter 2 suggests that persons with high materialism aspirations are actually less happy, more dissatisfied with their lives, and have lower rates of mental well-being than those who are less materialistic (Burroughs & Rindfleisch, 2002).

Although there appears to be an ever-growing and substantiated body of literature regarding materialism and its relationship with psychosocial well-being, relatively little is understood about how those two variables interact within the bigger context of life values (Burroughs & Rindfleisch, 2002) and sociocultural determinants of health (Eckersley, 2001). Specifically, little is understood about the impact of materialism as it relates to physical health and participation in physical activity.

In order to address the aforementioned lack of depth in understanding of these variables, a multilevel approach was utilized that was both relational and descriptive. As previously described, the completion of a quantitative measure allows for a relational analysis of the variables as well as the categorization of participants for focus group work. The focus groups are then the dominant source of a more descriptive form of data. The findings from this study have shed light on why and how materialistic values are related to physical activity as discussed in chapters 4 and 5.

The methodology was based on a very basic understanding of the works of anthropologist Clifford Geertz and his well known idea of “thick description.” Geertz’s approach attempts not only to explain human behavior but also the context in which it occurs (Geertz, 1973). The study hopes to gain a rich description of whether and how personal values such as materialism influence physical activity, location of activity, and experience during activity. To date, no inquiry has attempted to describe this potential relationship, although it has often been

anecdotally discussed. The investigation of the potential relationships between these variables could contain important descriptors that can help us to more clearly frame the lens through which we consider physical activity and physical activity environments.

### *Qualitative Data Collection Procedures*

The present study used an initial quantitative assessment to assist in the categorization of participants based on their physical activity participation and materialistic orientation as discussed previously. Some discussion has taken place regarding how such segmentation should take place. Specifically, whether to use “naturally occurring” groups or networks versus drawing groups together for research purposes, although both practices are acceptable means of recruitment (Kitzinger, 1995), each carries with it associated strengths and weaknesses.

MacDougall and Fudge (2001) used existing networks to explore an Australian population with low physical activity participation. They defended their recruitment from existing groups and networks by stating that they were certain about the desirable characteristics or experiences they were wishing to explore. Utilizing existing groups permitted the participants to “self select” membership. Specific experiences were sought, but the research team did not want to recruit by labeling these experience (e.g., “lonely or isolated people”) because of the potential for social stigma; and finally using existing groups facilitated the continuance of communication with participants and study replication. MacDougall and Fudge’s (2001) defense of study methodology lends support to the approach taken by the present study. For the purposes of the present study, using an initial quantitative measure, participants were drawn together as a group of peers homogeneous on the topic of materialistic values as well as physical activity status without having to publicly recruit and label a given group as “materialistic exercisers,” and so on.

The attempt to create relatively homogeneous groups is a widely used practice (MacDougall & Fudge, 2001; Smithson 2000). So much so, it is often not discussed directly as an aim in the description of recruitment. It is widely understood that homogeneity in group composition is one approach to proactively address dominant voices within the group (i.e., the more similar a group is the less likely a divergent opinion would occur and subsequently be silenced or ignored; Smithson, 2000). Likewise, having similar group members increases the potential for understanding normative attitudes held by a group and allows for comparison to other groups (Smithson, 2000). The desire for homogeneous focus groups is present within physical activity research as well.

Segmenting exercise groups by activity level allows for between comparisons as well as intragroup homogeneity, which, in turn, allows for focus on the topic at hand instead of the divergence of behaviors and attitudes about physical activity within the group. Hohepa, Schofield, and Kolt (2006) utilized focus groups segmented by a measure of socioeconomic status, race, and physical activity while researching how Australian high school students felt about physical activity. Wilcox, Der Ananian, et al. (2006) used a similar approach in the investigation of physical activity experiences of arthritis sufferers. The study delineated groups according to exercise status, socioeconomic status, and race. An additional study of physical activity and arthritis by the same research group used focus groups categorized as the previous study with the addition of a third group for insufficiently active adults: those who were active but not meeting the recommendation levels of the “exercisers” (Wilcox, Der Ananian, et al., 2006).

McLafferty (2004), citing several sources, recommended the intentional consideration of the number of groups conducted. Although divergent opinions on this topic exist, the emerging consensus is to achieve satiation but avoid redundancy. Additionally, it is recommended to use

more than one group for any given subpopulation. Wilcox, Der Ananian, et al. (2006) utilized this method during the investigation of physical activity and arthritis by utilizing two focus groups for each of the aforementioned physical activity categories. Further, McLafferty discussed the lack of agreement on the group size for each focus group. Recommendations for group size range from 4-6 to 15-20. The present study was hoping to recruit 6-8 participants for each group, understanding that smaller groups allow for more interaction, whereas larger groups provide more diversity of thought.

As such, all persons with student status were eligible to participate in completing the questionnaire; however, only participants that completed the questionnaire in full and remained in the dataset after the described cleaning protocols were eligible for participation in focus groups. Focus groups were drawn from categorized quintiles of METminutes of activity and relative intrinsic orientation to target those participants from the most disparate groupings (e.g., those from the highest activity quintile with those from the most materialistic quintile formed the active/extrinsic group). Focus group recruitment proved to be a challenge. Although significant effort was invested on recruiting a minimum of 8 persons for each group, individuals' schedule availability did not always permit this. Morgan and Krueger (1998) provided some insight into this dilemma in his reference set regarding focus groups. Although 6-10 participants is seen as the optimal range, Morgan and Krueger (1998) also made the case for occasions where smaller groups would be more appropriate. Scheduling difficulties and small participant pools were both mentioned as potential reasons to warrant smaller groups. Additionally, an example was given of a focus group conducted with only three participants, and it was stated that the group yielded exceptional data for the study. Smaller group size can also be found within the physical activity literature, usually indirectly, for example Bauer, Yang, and Austin (2004) stated that their

average focus group size was four participants; whereas Rimmer, Riley, Wang, Rauworth, and Jurkowski (2004) did not clearly state actual participation rates but rather stated that they had recruited four to six participants for each group. Similarly, Hesketh, Waters, Green, Salmon, and Williams (2005) also utilized small groups ranging from 3-6 children.

A focus group guide was developed with the assistance of committee members. The focus group guide was piloted with a small number of graduate students for clarity and content. A final version of the focus group guide was then discussed again with committee members. The guide was used in each of the eight focus groups conducted.

### *Qualitative Data Analysis*

Focus group research is never without complexity. Duggleby (2005) suggested that analyzing the three levels of data derived from focus group activities (individual, group, and group interaction) is a complex task. Group interaction data is often omitted from analysis and exploration in publications using focus group methods. The present study used only group interaction data that illuminated the emerging themes of group and individual results. A more in-depth analysis of group interaction and dynamics would be a possibility for review at a later date. The dominant purpose of the focus groups is to more deeply understand if and how materialistic values are related to physical activity participation, location, and experience. These items are investigated through discourse exploring materialistic manifestations during activity, perceived norms of materialism, and perceived activity environments.

As stated previously, the quantitative scores were used to originate the lists for focus group participants. METmin and Aspiration Index scores were recoded into new variables according to quintiles. The 5 x 5 design allowed the strongest responses for the categories to be utilized: the four corners of a cross tabulation matrix, in other words the most active and inactive

people with the most extrinsic (materialistic) and intrinsic (nonmaterialistic) orientations of the sample. Once groupings were established, the lists were then double checked to ensure that persons were within the traditional student age range of 18-24 years (U.S. Department of Education, 2007). Groups 1 and 5 were drawn from the summary list comprised of inactive, extrinsic participants (recruiting pool  $n = 20$ ). Similarly, Groups 2 and 6 were comprised of inactive, intrinsic oriented participants (recruiting pool  $n = 20$ ); Groups 3 and 7 were comprised of active, extrinsic oriented participants (recruiting pool  $n = 25$ ); and Groups 4 and 8 were comprised of active, intrinsic oriented participants (recruiting pool  $n = 13$ ). Because the small cell size and difficulty getting responses were limitations of focus group recruitment, the second group from each category utilized an expanded parameter for recruitment. Participants were sorted in Microsoft Excel by activity quintile and the Aspiration Index as a continuous variable. By using this approach, the activity level was equivalent (e.g., most active category), and the persons contacted had the highest materialism scores in the 4<sup>th</sup> quintile, meaning they were within the closest 10 participants of the next materialism grouping.

All members of each grouping were contacted initially by email explaining the time frame and requesting their schedules. Phone calls were initiated immediately as well, with each participant being contacted at least once. In most cases, participants received multiple calls to connect directly with the person rather than voicemail. Participants were offered dinner and a \$5 gift card for their participation. Persons who were nonresponsive after five phone attempts or indicated that they were not available to participate were not contacted again. Phone calls proved to be the most effective means of contacting people in order to get them at their varied academic and work locations. Meeting times were set once eight or more student schedules permitted one common meeting time. An initial email announcing the time was then sent to the participants that

indicated that they would participate, a follow-up email was sent the night before the group meeting, and a phone call the morning of the meeting day helped to remind students of the time and location of the meeting.

In spite of the efforts to retain agreeing participants for focus group participation there was some attrition between their agreement to participate and the meeting time. Some students emailed with various conflicts, and others simply did not show up. Actual focus group participation was as follows: Group 1 = 5, Group 2 = 6, Group 3 = 3, Group 4 = 6, Group 5 = 4, Group 6 = 3, Group 7 = 2, Group 8 = 3. The average group size was 4 participants. The active, extrinsic orientation grouping was very difficult to schedule. Although that grouping was one of the larger groups initially ( $n = 25$ ), many were athletes and either too busy or disinterested in participation. Of the preliminary contacts, this group required by far the most attempts to reach them (3-5), were the least responsive, and were the least reliable, demonstrated by the fact that this grouping yielded the lowest participation numbers of all the focus groups.

The audio files from the focus groups were transcribed verbatim, with all eight transcripts verified by a graduate student trained in qualitative work. The analysis was guided by grounded theory techniques established by Strauss and Corbin (1990) and Creswell (2007) and balanced with the literature available in the respective fields. Open and axial coding were utilized to initially analyze data. There was movement between the quantitative and qualitative portions of analysis, allowing for a continual checking of both sources for congruence and understanding. Based on several iterations of coding, a coding tree was developed to assist in analysis but also in coding verification. A 25% check of the author's coding was performed by a graduate student with qualitative training. Following, the coded data was examined for differences or similarities that occurred between groups and in comparison to the literature. What arose out of this

investigation was a more “thick description” of the experience of physical activity and how materialistic values might contribute to participation in activity and in its experience.

### Research Question Assumptions

The following research questions were utilized in the investigation of the relationship between physical activity and materialism. In a general sense, these questions were based on a series of assumptions: that a relationship between materialism and activity exists (ontological assumption), that it can be known (epistemological assumption), and that it can be understood through the methods described here (methodological assumption).

Research Question 1: Do materialistic values impact participation in physical activity?

This question was addressed by quantitative means. Preliminary and investigative analyses were conducted so as to satisfy both the need to understand the quantitative relationship between materialism, physical activity, and other variables known to be related based on previously discussed literature, as well as the need to develop categorical groupings for the development of focus groups. The relative intrinsic orientation and METminute scores were used to determine categorical status for focus groups. The findings of the quantitative analyses are described and discussed in chapter 4.

*Assumptions of RQ 1:* With the global increase of consumption ideologies, it was assumed that materialistic values may be a dominant values force among college students and would influence physical activity in some manner.

Research Question 2: Do materialistic values influence the selection of physical activity location?

This question was addressed qualitatively by investigating how, when, where, and why participants choose to be or not be active. Each group represents a relatively homogeneous group

in reference to relative intrinsic orientation and activity status. Substantive qualitative investigation helped to clarify what and how various factors influence physical activity location.

*Assumptions of RQ 2:* It was assumed that materialistic values would influence how, when, where, and why students choose to be physically active. For example, students who are more concerned with image (external values orientation) would participate in activities that increase the chances of being seen by others while being active.

Research Question 3: Do materialistic values influence the individual's experience of physical activity?

Research Question 3 was addressed both quantitatively and qualitatively. This question was meant to address participants' own feelings and awareness while they are being active and how aware they are of the perceptions of others. This question builds on the information gathered through the previous questions in an attempt to describe in a more meaningful way how people simultaneously experience the environment, norms, and personal values.

*Assumptions of RQ 3:* This question assumed that materialistic values manifest themselves in tangible and experiential ways, such that values influence an individual's subjective experience of physical activity. This presumption was based on Lefebvre's (2001) conceptualization of the interaction and confluence of representational spaces, spatial practice, and representations of space, which was adapted for this study as shown in the Venn diagram previously included.

Research Question 4: To what extent, if at all, are materialistic values and physical activity related to social norms?

Research Question 4 was addressed through both quantitative and qualitative means. Quantitatively, the relationship between materialism and physical activity was tested through

linear regression. Additionally, focus groups were conducted about whether, how, and to what extent, perceived social norms influence physical activity participation, location, and experience. Again, this question draws on the information from the previous questions but specifically focuses on social normative influences on activity.

*Assumptions of RQ 4:* Social norm constructs have been inconsistently operationalized in physical activity research, thereby creating a bevy of inconsistent results. It was presumed that injunctive and descriptive norms influence materialistic orientations as well as physical activity participation. Therefore, social norms should play an important influential role in the relationship between materialism and physical activity.

Research Question 5: Are materialistic values a barrier and/or facilitator of physical activity?

Research Question 5 was addressed through quantitative analysis as well as qualitative methods. Barriers were categorized as external, internal, and personal as per D. M. Williams, Anderson, and Winett (2005). External barriers are those things like lack of access to facilities, transportation, or money that might keep a person from being active. Personal barriers include lack of time or social support, injury or sickness, and fear of injury that might keep a person from being active. Lastly, internal barriers were described as lack of motivation, desire, or feeling self-conscious that might keep a person from being physically active.

*Assumptions of RQ 5:* It was presumed a lack of image related consumer goods (those without technology gadgets or brand names) may function as a hindrance to participation in activity through peer injunctive and descriptive norms (beliefs about others' expectations, and social modeling).

## CHAPTER 4

### RESULTS

#### Introduction

The purpose of this study was to gain a better understanding of how materialistic values interact with the social and physical environments to influence physical activity participation, location, and the experience of being active. In order to investigate these potential relationships, a more clear understanding must be developed of how materialism was demonstrated and perceived during physical activity as well as the relative importance placed on that variable by college students. All quantitative analyses for this study were performed on Statistical Package for the Social Sciences (SPSS) version 16.0.

#### Sample Population

Table 2 shows the demographics of the sample. A total of 127 males (26.1%), 357 females (73.3%), and 3 individuals who did not indicate their sex comprised this sample ( $n = 487$ ) of 18- to 24-year-old students at a large university in the southeastern United States. The sample was predominantly Caucasian (82.3%), with few participants of African American (14.2%) or other (3.5%) racial heritage. The majority of the students were in-state residents (70.2%) and reported living on (34.9%) or within 2 miles (45.7%) of campus. Nearly all were single (98.4%) and did not have children (99.0%). Students were recruited from within a College of Human Environmental Sciences. All course instructors of record within the college were contacted regarding making the survey available to their students and the possibility of offering extra credit (not to exceed 2% of the total value of the class) if they were willing to do so.

Instructors of seven courses encouraged their students to take the survey without offering the incentive of extra credit, and those of 39 courses offered it with the incentive. Although there was likely some co-enrollment across courses, using enrollment figures for participating courses there were a potential for 1,755 students to complete the questionnaire. The final dataset used for these analyses had a sample size of 487, at minimum a 27.7% response rate.

Table 2

<i>Sample Demographics</i>		
Characteristic	<i>N</i>	%
Sex		
Male	127	26.2
Female	357	73.8
Race		
Caucasian	401	82.3
African American	69	14.2
Multi-Racial	7	1.4
Asian	6	1.2
Hispanic / Latino	2	.4
Other	2	.4
Age		
18	47	9.6
19	117	24.0
20	108	22.2
21	93	19.1
22	68	14.0
23	37	7.6
24	13	2.7
missing	4	.8
Residency		
In State	342	70.2
Out of State	138	28.3
International	7	1.4
Housing Location		
On Campus	169	34.9
Adjacent ( $\leq$ 2 miles)	221	45.7
Off Campus ( $>$ 2 miles)	94	19.4
Marital Status		
Single	478	98.4
Married	7	1.4
Divorced / Separated	1	.2

Financially, most students reported no financial contribution in the areas of tuition and fees (65.1%), rent or dorm expenses (61.8%), automobile or renter's insurance (78.4%), or medical insurance (83.0%; Table 3). The vast majority (92%) reported having a car regularly used to commute or run errands. Fifty-eight percent reported not having a job at the time of the survey, with an additional 11.1% working less than 10 hours per week compared to 21.6%, and 7.0% who reported no summer employment or working less than 10 hours per week in the summer respectively (Table 4). Participants described their lifestyle and ability to buy nonessential items as being able to buy or receiving things they wanted once or twice per month (31.7%), once a week (26.1%), a couple times per week (19.9%), almost whenever they want (16.6%), and whenever they want (3.9%), whereas only 1.7% reported having difficulty affording their basic needs such as food, shelter, and utilities.

As discussed previously, most financial measures applied to students are indirect. This attempt at direct measurement carries with it the inherent flaws of self-report and perceived data rather than more objective measures. Similarly, questions regarding employment tend toward generalizations of the sample population. However, both perceived financial contribution and employment status give the researcher a better understanding of the sample population lifestyle and expectation, therefore they are important demographic descriptors for a study seeking to understand materialistic values.

Table 3

*Student Perceived Financial Contribution to Life Expenses*

Expense	Perceived % of Financial Contribution to Life Expenses										
	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %	100 %
Insurance: Medical											
<i>n</i> = 478	404	4	7	1	2	20	1	0	6	5	28
% sample	84.5	0.8	1.5	0.2	0.4	4.2	0.2	0.0	1.3	1.0	5.9
Insurance: Auto/Renter											
<i>n</i> = 476	382	3	7	4	6	24	1	4	7	5	33
% sample	80.3	0.6	1.5	0.8	1.3	5.0	0.2	0.8	1.5	1.1	6.9
Tuition & Fees											
<i>n</i> = 480	317	16	14	12	5	24	2	6	10	7	67
% sample	66.0	3.3	2.9	2.5	1.0	5.0	0.4	1.2	2.1	1.5	14.0
Rent or Dorm											
<i>n</i> = 479	301	12	12	12	6	30	3	4	7	8	84
% sample	62.8	2.5	2.5	2.5	1.3	6.3	0.6	0.8	1.5	1.7	17.5
Other School Expenses											
<i>n</i> = 479	208	23	26	17	16	43	8	10	20	10	98
% sample	43.4	4.8	5.4	3.5	3.3	9.0	1.7	2.1	4.2	2.1	20.5
Vehicle / Gas											
<i>n</i> = 475	187	10	13	11	20	56	9	15	20	13	121
% sample	39.4	2.1	2.7	2.3	4.2	11.8	1.9	3.2	4.2	2.7	25.5
Food											
<i>n</i> = 479	139	25	30	22	18	57	14	17	17	22	118
% sample	29.0	5.2	6.3	4.6	3.8	11.9	2.9	3.5	3.5	4.6	24.6
Clothing											
<i>n</i> = 479	104	21	25	19	21	64	17	24	24	20	140
% sample	21.7	4.4	5.2	4.0	4.4	13.4	3.5	5.0	5.0	4.2	29.2
Entertainment											
<i>n</i> = 478	80	14	14	10	10	42	8	19	36	42	203
% sample	16.7	2.9	2.9	2.1	2.1	8.8	1.7	4.0	7.5	8.8	42.5

Table 4

*Present and Summer Employment Status*

Work Schedule	<u>Present Employment</u>		<u>Summer Employment</u>	
	<i>n</i> = 478	%	<i>n</i> = 479	%
Do not have a job	286	59.8	105	21.9
Work < 10 hours/week	54	11.3	34	7.1
Work 11–20 hours/week	83	17.4	67	14.0
Work 21–30 hours/week	35	7.3	99	20.7
Work 31–40 hours/week	9	1.9	100	20.9
Work > 40 hours/week	11	2.3	74	15.4

## Research Questions

Research Question 1: Do materialistic values impact participation in physical activity?

This question was addressed through quantitative means. Initial quantitative analysis was necessary to establish and quantitatively describe the parameters of the relationship between materialistic values and physical activity. The quantitative findings are valuable in their own right; however they also served as the foundation for the categorization of participants for focus group (qualitative) participation.

Table 5 demonstrates an initial inquiry into how materialism relates to the other variables of interest. Physical activity literature, as discussed previously, has established relationships between physical activity and the other independent variables included in this study with the exception of materialism. This study represents the first time that materialism has been linked to physical activity behavior. Therefore, relative intrinsic orientation (summary construct for materialistic values, and an independent variable) as well as the materialism subscales have been

included for the purposes of establishing initial connections with the more established variables surrounding physical activity.

The correlation matrix demonstrates the various relationships between physical activity (total METminutes transformed), minutes sedentary (total minutes of sedentary behavior per day), life satisfaction (LS), general self-efficacy (GSE), physical activity self-efficacy (SEPA), physical activity social support (PASS) and the Aspirations Index (AI; Kasser & Ryan, 1996) summary score (relative intrinsic orientation) and the various subscales of the intrinsic (self acceptance, affiliation, community feeling, and fitness) and extrinsic (financial success, attractive appearance, and social recognition) values measurements.

Table 5

*Pearson Correlation Coefficients Aspiration Index and Subscales with Physical Activity and Related Variables*

		Aspiration Index (Kasser & Ryan, 1996)							
		Relative Intrinsic Orientation	AI: Intrinsic Mean Corrected Relative Importance Subscales				AI: Extrinsic Mean Corrected Relative Importance Subscales		
			Self Accept.	Affil.	Comm. Feeling	Fitness	Fin. Success	Attractive Appear	Social Recogn.
Physical Activity	<i>r</i>	-.100*	-.092*	-.145**	-.082	.011	-.001	-.005	.198**
	sig.	.027	.043	.001	.071	.803	.977	.917	< .001
Minutes Sedentary Per Day	<i>r</i>	.213**	.216**	.236**	.139**	.071	-.022	-.168**	-.240**
	sig.	< .001	< .001	< .001	.002	.121	.634	< .001	< .001
LS	<i>r</i>	.221**	.192**	.205**	.105*	.198**	-.177**	-.106*	-.193**
	sig.	< .001	< .001	< .001	.021	< .001	< .001	.020	< .001
GSE	<i>r</i>	.011	.074	-.066	-.024	.053	.017	-.065	.025
	sig.	.812	.106	.153	.602	.252	.715	.160	.594
SEPA	<i>r</i>	.050	.070	-.042	-.025	.167**	-.086	-.081	.043
	sig.	.272	.126	.356	.582	< .001	.060	.077	.354
PASS	<i>r</i>	-.078	-.038	-.014	-.076	-.115*	.043	.078	.047
	sig.	.090	.405	.768	.100	.012	.358	.093	.305

\* Correlation is significant and the 0.05 level (2 tailed).

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

Although the relative magnitude of the significant correlations shown in Table 5 are not particularly strong, the subscales were included because their relationships are directionally consistent across subscales and variables. For example, the fitness subscale was positively associated with life satisfaction ( $r = .198, p < .001$ ) and physical activity self-efficacy ( $r = .167, p < .001$ ); similarly physical activity was negatively associated with the intrinsic values of self-acceptance ( $r = -.092, p = .043$ ) and affiliation ( $r = -.145, p = .001$ ), but positively associated with the extrinsic subscale of social recognition ( $r = .198, p < .001$ ). Conversely, sedentary behavior was positively associated with less materialistic values like self-acceptance ( $r = .216, p < .001$ ) and affiliation ( $r = .236, p < .001$ ) but negatively associated with more materialistic values such as attractive appearance ( $r = -.168, p < .001$ ) and social recognition ( $r = -.240, p < .001$ ). Although sedentary behavior is discussed later in terms of potential for mirroring results (time being sedentary can not also be time being active), it is included in the majority of analyses because it is not always mutually exclusive with activity and because it has begun to develop its own body of literature linking in to health outcomes.

Table 6

*Pearson Correlation Coefficients for Physical Activity, Materialism, Sedentary Behavior, Life Satisfaction, and Self-Efficacy*

		Relative Intrinsic Orientation	Physical Activity	Minutes Sedentary Per Day	LS	GSE	SEPA	PASS
Relative Intrinsic Orientation	<i>r</i> sig.	-						
Physical Activity	<i>r</i> sig.	-.100*	-					
Minutes Sedentary Per Day	<i>r</i> sig.	.213**	-.317**	-				
LS	<i>r</i> sig.	.221**	-.007	-.097*	-			
GSE	<i>r</i> sig.	.011	.105*	-.130**	.339**	-		
SEPA	<i>r</i> sig.	.050	.335**	-.284**	.177**	.268**	-	
PASS	<i>r</i> sig.	-.078	.120**	-.206**	.161**	.136**	.167**	-

\* Correlation is significant and the 0.05 level (2 tailed).

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

The Pearson correlation coefficients indicate several statistically significant relationships between materialism, physical activity, and sedentary behaviors. Participants who were less materialistic (more intrinsically oriented) were significantly less active ( $r = -.100, p = .027$ ), more sedentary ( $r = -.213, p < .001$ ), and had higher life satisfaction scores ( $r = .221, p < .001$ ). Increased level of physical activity was, as expected, negatively associated with minutes of sedentary behavior ( $r = -.317, p < .001$ ), and positively associated with measures of self-efficacy (GSE  $r = .105, p = .022$ ; SEPA  $r = .335, p < .001$ ) and social support ( $r = .120, p = .009$ ). The

strongest of these relationships was that of physical activity and the physical activity specific self-efficacy scale: The correlation was above .3, which indicates a moderate strength correlation. Participants who spent more time being sedentary were less satisfied with their lives ( $r = -.097, p = .034$ ), had lower self-efficacy scores (NGSE  $r = -.130, p = .005$ ; SEPA  $r = -.284, p < .001$ ) and had lower social support ( $r = -.206, p < .001$ ). Finally, satisfaction with life was positively correlated with self-efficacy (GSE  $r = .339, p < .001$ , a moderate strength correlation; SEPA  $r = .177, p < .001$ ) and social support.

In an exploratory multiple regression all of the variables from Table 6 were entered into the model ( $n = 445$ ), which was found to be significant ( $p < .001$ ), with the specific constructs of sedentary minutes ( $p < .001$ ) and self-efficacy for physical activity ( $p = .001$ ). The model explained 17% of the variance. The volume of variables increased the complexity of the model and was not in the best interest of parsimony. In Table 6, LS did not have a significant relationship with physical activity (METminutes transformed, dependent variable) and the physical activity specific measurement (SEPA) had a much stronger association ( $r = .335, p < .001$ ) with the dependent variable than the GSE ( $r = .105, p = .022$ ), therefore LS and GSE were removed from the model in the interest of colinearity and parsimony.

A subsequent stepwise regression was conducted to ascertain the relative importance of the included variables (METminutes transformed as dependent variable, relative intrinsic orientation, minutes sedentary per day, PASS, and SEPA;  $n = 461$ ). The analysis predicted two steps that were both significant ( $p < .001$ ); the strongest predictor given in the first step was minutes of sedentary behavior per day ( $R^2 = .102$ ). The second step, by including SEPA, increased the  $R^2$  to .157, explaining roughly 16% of the variance. Because relative intrinsic orientation and sedentary behavior had a significant correlation ( $r = .213, p = .001$ ) and to avoid

the potential for mirror images of time (time being sedentary can not also be time active), sedentary behavior was removed from the model and an additional stepwise regression ( $n = 463$ ) was conducted with the variables physical activity (METminutes transformed, dependent variable), relative intrinsic orientation, PASS, and SEPA. This analysis also returned a two-step model where both models were significant ( $p < .001$ ). The strongest predictor in the model was SEPA ( $R^2 = .102$ ) followed by relative intrinsic orientation ( $R^2 = .113$ , variant inflation factor = 1.003). Although the variance explained drops to 11% with the second analysis, for the reasons previously explained (mirroring and colinearity) this model was the one selected as most demonstrative of the relationships at hand.

Before a discussion regarding these research questions can continue, some manner of definition of approach must take place. There is an inherent overlap of the topics under examination here. For example, location could be viewed as literal built environment, the value placed on that location, the normative behavior expected in or associated with that location, and the affective experience of that location. Therein lies the challenge of this research. It is the author's belief that the environment, values, norms, and experience are dynamic and interconnected in a way that makes individuating each portion both impossible and yet necessary to thoroughly understand them.

For the purposes of this investigation location was described as places that participants went and characteristics that made them prone to be in that location, have a given perception of distance or negotiate their built environment in the way that they did. A more complete discussion of location is given in response to the second research question. Participant experience of physical activity was described through ways in which participants declared their self-identity (statements like I am, I believe, I think; Hamilton & White, 2008) and the level of

self-awareness or self-consciousness they experienced while being active. The experience of activity is addressed in response to the third research question. Finally, social norms were defined through participants discussing perceptions of what their peers think and do (Fishbein, Triandis et al., 2001). The elaboration on social norms can be found in response to Research Question 4. All of the aforementioned guidelines were a result of the amalgamation of literature and conceptualized as the Venn diagram given as Figure 2. Having these general guidelines and definitions established should hopefully make these results more clear to the reader.

Research Question 2: Do materialistic values influence the selection of physical activity location?

This question was addressed qualitatively by investigating how, when, where, and why participants choose to be or not be active. Each group represents a relatively homogeneous group in reference to relative intrinsic orientation and activity status. Substantive qualitative investigation helped to clarify which and how various factors influence physical activity location. Focus groups were conducted based on four categorical groupings: (1) inactive, extrinsic values, (2) inactive, intrinsic values, (3) active, extrinsic values, and (4) active, intrinsic values.

Between-group differences emerged through the qualitative analysis. Differences regarding type of activity, location, and competitiveness were seen between the contrasting materialistic orientations (extrinsic versus intrinsic). Differences between active and inactive categories were seen through the obvious differences in levels of activity, the desire or acceptability of self-transportation, and perceptions of distance. The inactive group (both extrinsic and intrinsic orientation) could name activities (and corresponding locations) they had

previously enjoyed, or enjoy periodically, but were less able to list activities in which they were regularly involved.

Extrinsic participants (active and inactive) indicated that they preferred or participated in traditional gym and sport-based activities predominantly at campus recreation facilities. Many of these traditional activities are often more goal oriented or competitive in nature, a characteristic that was found within both active and inactive participants with extrinsic orientations. The inactive, extrinsic group seem less eager to compete, but no less competitive.

“P5: It seems like it is kinda competitive at the rec.

P5 & P3: Yeah

P2: Yeah especially with the guys.

P4: Yeah like everybody’s trying to ...

P5: Sorry (to P1) but really ... you gotta lift those weights...

M: Do you feel that way? (To P1 who is male participant)

P1: Well I mean ... I mean I know it’s true.

P4: Cuz like if your intentions are like to work out for 30 minutes but then you see 3 other girls that are there for like 45 minutes and they are going and it’s like your adrenaline gets going so you are like I need to stay on longer because they are staying on longer and then it’s like a competition—it’s like I need to stay on. So then you lose.”

And continuing later with:

“P5: see now I like to go alone because even if I go with somebody because whenever I go with somebody I’m always trying to beat them – secretly of course.

[laughter]

M: do you think they notice?

P5: you know I don't know I always make sure I point out like I lost the most calories and I got the high time, I make sure I point it out but I don't think they notice."

Whereas the active, extrinsic group seems to seek competition out.

"Something with sports involved. Go pick up a game of football—two hand touch or something like that. I mean I am playing intramural softball right now."

"But uh like the rec fields are the best thing ever. You can just go out there and start a football game. I am so competitive. I am competitive. I got like little man syndrome bad. And so like that is why I want to go to the rec and just work out so hard and then I'm going to go play football and be the best. I'm not the best, but I want to be. I think that is awesome. That is one of the things I like doing during the week is being competitive."

Extrinsic orientation carries with it a high level of awareness of self and others, which is discussed later in response to Research Question 3. An inherent part of activity in a traditional location (environment) is the aspect of "being seen" or "seeing others." This is a factor that separates perceptions of active and inactive persons with extrinsic orientations. Inactive, extrinsic participants acknowledged it, but appeared to be uncomfortable in some instances choosing alternate locations (aquatics center, or moving to the back row of machines). Active, extrinsic persons were much more open to the idea of seeing and being seen, at least tolerating it and in some cases embracing it as something to look forward to.

"I've met a lot of good people in there so and that is why I keep going back because I like meeting people. I will do anything where I can meet people. You meet so many people at the rec man. I have never been in the aquatics center because I have heard

people say that—well the rec’s so packed I’m going to the aquatics center. So automatically I’m thinking well that place isn’t packed why would I go?”

Taking the importance of location one step further, extrinsic participants sometimes attach group identity to location, such as “P3: like I guess my group of friends. Like a lot of people go play on the quad. My group wouldn’t go play on the quad. M: So who is playing on the quad? P3: people that have dogs and like to play Frisbee.”

Intrinsically oriented participants in this sample were more likely to express their enjoyment of nontraditional activities. Although, in general, the inactive group was unapologetically disinterested in being active: “I don’t feel like doing any type of physical activity... I don’t really think about it until I took your survey [laughter] and this health class.” The active intrinsic group seemed to have a generally active lifestyle and yet possess an awareness of the need to be regularly active. They were regular users of the gym but also sought out alternate methods for activity that focused more on noncompetitive types and locations for activities they could enjoy with friends.

“P3: It’s not the same I mean I like kicking a ball around or throwing a Frisbee but like none of this intense keeping score ... like no there’s only – you have 2 and we have 1. It’s just like, I don’t need that

P1: exactly. Just kinda playing around and being active. Being active getting your blood pressure up a little bit makes you feel so much better. It makes me feel so much better about myself.

P2: yeah it does

P3: me too. I like when it gets warm we usually take a volleyball out to the pool. I like go swimming and that is fun.”

The greatest differences in the perceptions of distances were between active and inactive participants. Inactive participants saw campus distances as extreme (“It would take all day to get in to campus” from perimeter soccer) and prohibitive to self transportation.

“P1: I would probably walk to class, sometimes I do walk back from Doster to my car [Coleman lot] but usually I have a whole bunch of stuff from my major so like I’m carrying this huge bag and all this other stuff. It gets so heavy walking so far.

P2: I would never do that [laughs]

P3: yeah [agreeing]

P2: I would NEVER do that, No I would never do that.

P3: that’s when I would get in my car [laughing]

P2: I would never walk that far. I wouldn’t not if I didn’t have to

M: you would get on a bus?

P2: yes! Yes I would.”

Additionally, it would appear that distance is a factor in both scheduling classes (“I kinda planned mine to be in this area. Add to my laziness. [laughter] cuz I was just taking electives so I was like oh what is on this one little road that I can take”) and how courses are rated (“M: so you have a music class? Do you like it? P2: mmmm. It’s okay. It’s a little bit of a walk but yeah.”).

Active participants saw distance as less of an issue, although active, extrinsic participants regularly drove their vehicle to go workout on campus. Active, intrinsic participants however, were more likely to walk or run to the gym but acknowledged often their friends weren’t willing to join them in that approach.

“P2: they don’t want to drive to the rec or you know lazy stuff

P3: and running is out of the question.

P2: yeah

P3: it's too far. It's too far.

P2: or walking. I always ask my friend do you want to walk to the rec and they're like no just drive. Ok I mean you are just going to go walk when you get there or run

P3: yeah it's true"

Similar to the differences found in perceived distances, the major differences in transportation preference (negotiating the built environment, moving from location to location) were between active and inactive participants. Inactive participants seemed to be split on bus use for short travel, although several references were made to taking the bus from the main administration building to the main library and then walking to the student center for lunch. Active participants were more likely to walk for self-transportation to and from classes, and generally less likely to use the bus, but there was some evidence that this too could be based on distance from parking to destination (specifying how close their parking spot was). Again, active, extrinsic persons regularly drove themselves to the gym, whereas active, intrinsic participants were split on this issue and seemed to enjoy engaging in some self-transportation ("I've always liked to walk"). In a general sense, although there were some differences between extrinsic and intrinsic groups regarding activity location preferences and motivations, some of those differences were overshadowed by differing activity status. Between-group differences can be summed up by the following table (Table 7).

Table 7

*Group Preferences for Physical Activity Location, Perceptions of Distance, and Transportation Preference*

	Inactive	Active
	<p><i>Activity Location &amp; Type</i>                      Traditional (gym and sport based)                      Some nontraditional activity                      Low regular participation level</p>	<p><i>Activity Location &amp; Type</i>                      Traditional (gym, sport, outdoorsman)                      Competitive based                      Regular participation in activity</p>
Extrinsic	<p><i>Perception of Distance</i>                      Self transport only for short distances                      Distance is prohibitive</p>	<p><i>Perception of Distance</i>                      Close parking makes campus walkable</p>
	<p><i>Transportation Preference</i>                      Split bus use &amp; walk for self-transport                      Drive self on campus</p>	<p><i>Transportation Preference</i>                      Mostly self-transport, low bus use                      Drive to workout</p>
	<p><i>Activity Location &amp; Type</i>                      Some traditional (sport) participation                      Low participation desire                      Some nontraditional interests</p>	<p><i>Activity Location &amp; Type</i>                      Some traditional (gym &amp; sport)                      Nontraditional/Active lifestyle                      Regular non-competitive activity</p>
Intrinsic	<p><i>Perception of Distance</i>                      Campus distances are extreme                      Distance is prohibitive</p>	<p><i>Perception of Distance</i>                      Campus distances are moderate                      Aware peers find distance prohibitive</p>
	<p><i>Transportation Preference</i>                      Split bus use &amp; walk for self-transport                      Drive self on campus</p>	<p><i>Transportation Preference</i>                      Walk for self-transport                      Drive self sometimes/with friends</p>

Research Question 3: Do materialistic values influence the individual’s experience of physical activity?

Research Question 3 was addressed both quantitatively and qualitatively. This question was meant to address participants’ own feelings and awareness while they were being active, how aware they were of the perceptions of others. This question builds on the information

gathered through the previous questions in an attempt to describe in a more meaningful way how people simultaneously experience the environment, norms, and personal values.

*Quantitative Analysis.* Table 8 shows correlation coefficients for variables related to self-awareness and self-standard as they relate to the primary variables of materialism, sedentary behavior, and physical activity. Relative intrinsic orientation (least materialistic) was previously shown as positively associated with sedentary behavior and negatively associated with activity. Whereas participants with more materialistic orientations were more likely to see themselves as keeping up with trends, being fashionable, and keeping up with technology ( $r = -.284, p < .001$ ), this self-standard of materialism was negatively associated with being sedentary ( $r = -.144, p = .002$ ) and positively associated with social support ( $r = .142, p = .002$ ) and self-standard for fitness ( $r = .207, p < .001$ ). The strongest correlations present were those of self-standard for fitness. Participants who said their self-identity was a regularly active, fit, and healthy person were less likely to be sedentary ( $r = -.391, p < .001$ ), had higher physical activity specific self-efficacy ( $r = .619, p < .001$ ), and were more likely to be physically active ( $r = .445, p < .001$ ) and have social support ( $r = .264, p < .001$ ). Exploratory regression analysis was conducted to get a clearer understanding of the relationships of all of the constructs included in Table 8.

Table 8

*Pearson Correlation Coefficients for Materialism, Sedentary Behavior, Physical Activity, Self-Efficacy of Physical Activity, Social Support, and Self-Standards*

		Relative Intrinsic Orientation	Minutes Sedentary Per Day	Physical Activity	SEPA	PASS	Self- Standard Fitness	Self - Standard Materialism
Relative Intrinsic Orientation	<i>r</i> sig.	-						
Minutes Sedentary Per Day	<i>r</i> sig.	.213** < .001	-					
Physical Activity	<i>r</i> sig.	-.100* .027	-.317** < .001	-				
SEPA	<i>r</i> sig.	.050 .272	-.284** < .001	.335** < .001	-			
PASS	<i>r</i> sig.	-.078 .090	-.206** < .001	.120** .009	.167** < .001	-		
Self- Standard Fitness	<i>r</i> sig.	-.023 .662	-.391** < .001	.445** < .001	.619** < .001	.264** < .001	-	
Self- Standard Materialism	<i>r</i> sig.	-.284** < .001	-.144** .002	-.026 .572	.096* .038	.142** .002	.207** < .001	-

\* Correlation is significant and the 0.05 level (2 tailed).

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

All of the constructs in Table 8 were entered into a regression analysis (enter method), which found that relative intrinsic orientation ( $p = .011$ ), sedentary minutes ( $p < .001$ ), self-standard for fitness ( $p < .001$ ), and self-standard for materialism ( $p < .001$ ) were significant. Social support and self-efficacy of physical activity were not significant. The model explained 25% of the variance. Self-efficacy was positively associated with physical activity in the established literature, however there is an ongoing need to understand the extent of and paths through which that relationship occurs, and therefore further investigation was warranted.

All of the same variables were entered into a stepwise regression analysis. The initial analysis produced the following four steps ( $p < .001$ ) self-standard for fitness, sedentary minutes, self-standard for materialism, and relative intrinsic orientation respectively and explained 24.8% of the variance. Next, a stepwise analysis was conducted after minutes sedentary was removed for parsimony and to reduce the potential for mirroring as discussed. This model had three steps (each significant,  $p < .001$ ) self-standard for fitness, self-standard for materialism, and relative intrinsic orientation, and explained 21.6% of the variance. Self-standard for fitness and self-efficacy as shown in Table 8 were highly correlated ( $r = .619$ ,  $p < .001$ ), in order to assess self-efficacy in the model self-standard was removed. This model also produced 3 steps (each significant,  $p < .001$ ) that included self-efficacy, relative intrinsic orientation, and self-standard for materialism, but the variance explained was cut almost in half ( $R^2 = .120$ ). Therefore it was concluded that in this analysis self-standard for fitness was a better fit for the model. Consequently, self-efficacy was removed and self-standard for fitness was re-entered into the model (each significant,  $p < .001$ ) finding that self-standard for fitness, self-standard for materialism, and relative intrinsic orientation explained 21.6% of the variance.

*Qualitative Analysis.* In keeping with quantitative findings, a key emergent theme from the qualitative work was the importance of how participants perceived themselves, as materialistic or as active. A second emergent theme was participants' level of self-awareness or self-consciousness. In Research Question 2 the predominant group differences were found in the activity category, whereas there are more marked differences by materialistic orientation in this analysis.

Extrinsic orientation appears to place importance on appearance, specifically skinniness or physical attractiveness, as a key factor in health and as a major motivator for physical activity.

Both activity categories that were extrinsic saw themselves as essentially healthy and active at some level. However, when it came to appearance the inactive group acknowledged where they thought they fell behind.

“P5: like I have never worked out to be healthy. I have always worked out to be skinny cuz I wanted to.

M: So does that make it harder for people to maintain?

P5: Yes. Because once I saw that I wasn't getting any skinnier I quit.

P3: Once you hit that plateau it's like you are done. [yeah agreements]

P1: A lot of people expect changes to just to happen really quick.

P5: It's like a point where it just won't go down.

P2: Right and it doesn't happen.

P1: It's a slow process.

P5: It's too slow.

P2: That's the reason why I can't stick to it because I am a very impatient person [agreements-mmmhmm].

P3: Especially when it comes to weight loss.

P2: Right, and I like to see instantaneous changes, and you just can't do that. At all. It's gonna take months [laughter agreements].

P5: At least for a week you can.

P3: It's like you want surgery results in a week without the surgery.”

Inactive, extrinsic participants were aware that these desires were unrealistic, but their response instead of sticking with activity was to quit; being skinny is their only reason to work out and it takes too long or is unattainable.

Other inactive extrinsic traits include the need to feel or be seen as productive in spite of inactivity: “I can’t just lay around and not do anything. I mean I know I’m gonna set out this certain time for me to nap but I’m not going to sleep all day. Like I don’t want to feel like I’m not doing anything. I want to feel like I’ve gotten something done”; competition “Cuz girls, I see girls on the treadmill that are clearly competing with each other they just don’t know it. [laughter]”; and feeling self-conscious or judged.

“P5: But I don’t go now because I feel really self conscious ... I’m like really in there working out and so it just unnerves me a little so I just avoid it. Like if I could get a trainer and go in one of those little private rooms or something I’d do it but it’s too much money. [agreement]

P4: But um I hated going to the rec because like she said so many people making you self-conscious.

P3: Yeah, so many people just staring at you”

Judgment also comes in the form of perceived gender roles and boundaries

“P3: I like lifting weights but I really just don’t want to be surrounded by a thousand guys lifting weights.

P2: Yeah.

M: Why is that?

P4: They have like cliques.

P2: I wouldn’t say they have a sexist thing, but they’re like ‘oh she doesn’t know what she’s doin’ you know.’

M: You feel like you are getting judged a little bit. Do you think they feel that way about coming upstairs into the cardio area?

P4: I don't know because I have a friend that he's kinda like a big brother to me... but he easily goes and gets on the treadmill and runs like gladly.

P3: I think there are a lot more males upstairs than there are females downstairs.”

Active, extrinsic orientation has a similar focus on appearance as a primary indicator of health and reason for engaging in physical activity.

“I know girls—I don't know if guys like recognize this—but like ‘o my god, I'm just so fat’ and they are like a stick. They are skinny and then they are like ‘I need to go to the gym. I need to watch what I eat’. I'm like you aren't fat but yeah you do need to go to the gym and you do need to watch what you eat because one day you know you gonna have to stay healthy.”

In reality, the reference here was about staying skinny, not healthy.

Extrinsic, active persons, as in the discussion of physical activity location, place an emphasis on being seen or known either directly (“I always try to make a point to see all my friends. Like just in case something ever happened I wouldn't want them to bail on me.”) or indirectly through acquaintances (“I don't think she has a lot of friends, like outside, like she hasn't introduced me to anybody let's put it that way” and “she is like the more wild one who introduced me to a lot of people”). Although these comments don't directly speak to experience of physical activity, it is reasonable to assume that values are carried into other facets of life including activity. As mentioned earlier, location can be chosen as a method of being seen, and if being seen is a priority it influences the experience of activity as it heightens one's awareness of being watched: “When I first started back at the rec in January I was uncomfortable because I was like huge bigger so I was ‘oh golly I'm bigger’ so I was uncomfortable for a little while until I dropped 20 pounds.”

“When I was at the rec today, this morning, I noticed this girl she was like really overweight and she was on an elliptical and all the girls around here were like really thin and stuff and I could just tell... like kinda like ...she was on there for like 5 minutes and she just got off and then just walked away.”

The active, extrinsic group also tended to have highly critical and judgmental attitudes.

“Like the girls that are just like on the elliptical , and this is so funny to me, but they are like going so hard and I want to be like what level do you have it on because I now put it on like 8 or 9 and I’m like going at a good pace but it’s hard and these girls are just like going and they are like so like flimsy looking because there’s no resistance towards it at all. I just want to laugh at them. I’m like, you look like an idiot. Oh there’s this one guy, I’ve seen him a couple times when I’ve been up there he’s really skinny blonde headed guy and he just pounds the elliptical. He’s just going going going going and he just looks like so weird. I’m just like, do you look at yourself? Like? You just look so funny. You hate to laugh at him and you are sitting there and he looks sooo funny.”

This type of interaction was repeated throughout the focus groups for the active, extrinsic group and extended to diet as well:

“P1: I will say I am somewhat judgmental with people and weight, I can’t help it.

P2: Everybody is.

P1: I don’t mean to sound mean but it’s like ... okay... I think it’s different if like I see you eating a hamburger versus somebody who weighs 350 pounds eating a hamburger. It’s like you don’t really need to be eating that.

P2: Uh have y’all ever seen super size me? When he’s like ... whatever ... when is it going to finally sink in to our society that people shouldn’t eat stuff like this? I mean

we have no problem telling cigarette smokers, ‘Hey put down the cancer stick, ashy,’ but when can we tell people, ‘hey fatty put down the hamburger.’ I mean that’s the same thing.

P1: You are right. You are right. And you don’t think of it ... I’ve never thought of it that way but it’s true.”

Diet was also a form of introduction to guilt, which served as a major motivator for activity. Guilt was represented on a broad spectrum ranging from something as simple as a participant reaching to the candy bowl for a Hershey’s kiss only to be reminded by another participant of the calories and that it would necessitate a trip to the gym to work it off, to spin class “that is for when you are feeling really guilty” and leaving reminder messages for oneself

“P1: Yeah on my Mac computer, there is like stickies on there and it’s like little post-it notes that pop up and I’m like ‘ \_ don’t spend money’ ‘ \_ go to the rec today’ ‘ \_ you’ve got spring break.’

P2: I do that on my alarm. Like for if I need to wake up and go work out I’ll, you can name your alarm so whenever it is going off there is a message on the screen. I’ll put like ‘you didn’t work out last night.’”

In light of this group’s acuity for dispensing judgment, there was some evidence that they don’t perceive activity as being for everyone. That, perhaps, a bit of that judgment has to do with making themselves feel better for being active and knowing how to be active. Exclusion or possessive attitudes during activity may be a deterrent that inactive groups pick up on, which makes the traditional fitness setting more uncomfortable for people that have low self-efficacy. This exclusive attitude was exemplified in many ways, here is one example:

“I can’t stand people. I have low patience, no patience pretty much at all and I can’t stand when there is somebody walking in the runner lane. You just want to push them over the rail. It’s just like get out of my way.”

Even a group that was possessive of their right to an environment was not immune to feeling unwelcome when it comes to crossing gender boundaries

“There’s all guys down there, and I feel weird going down there and doing weights even though I really, like with volleyball in HS, I did, I squatted, benched and did all that. But I am not about to go down there and start benching in front of like 20 guys.”

Although active, intrinsic participants were aware of active, extrinsic culture (judgment, exclusion, competition, guilt) and would acknowledge its presence, they were clear that it was not how they felt or wanted to feel while being active. Active, intrinsic participants were regularly physically active because they wanted to, for example, “keep up with the health issue,” and “it is a big stress reliever for me, it makes me feel good about myself,” rather than to be or stay skinny. This group also incorporated a much more broad interpretation of what it means to be healthy. “I think for me to be healthy I have to have human interaction. I have to be able to vent and keep up with my friends and just kind of have to have time to relax and I have to get my sleep or else I’m grouchy,” to which another participant added, “I think it’s a maturity issue too. The older you get the more respect you have for your body, yourself, and your personal image.” In this instance personal image was a reflection of not participating in unwise behavior rather than an aesthetic-based image reference.

Active, intrinsic participants were regularly active and took physical activity as a broad spectrum of things rather than solely going to the gym to exercise. They tended to look at activity more inclusively rather than exclusively

“I mean one of the most fun nights I've had we had a bunch of my friends when I was still cheerleading and we just went out to the quad dressed in all black and we played like manhunt at night just running around the quad, it was a lot of fun. You know one time after it rained—it rained like a whole lot. And there were mud puddles all over the quad. We went out there and played football. We got back and took pictures everybody all covered in mud. So. I mean you don't need much. Just get some friends together and see what happens”

Inactive, intrinsic people may prove to be the toughest group to reach with physical activity interventions. They are unapologetically inactive, self-proclaimed unhealthy, and for the most part unmotivated to change. Inactive, intrinsic participants proved themselves knowledgeable and able to list healthy behaviors, but when asked if they performed those behaviors the response for both groups was a resounding *No*. Besides “not remembering the last time they were active,” they are generally not interested in being active as evidenced by the following comments: “P2: Some people try to stay away from the rec, people who aren't as active and just have no desire to work out or hate working out. P3: That's me. I walked all last semester so I'm tired of walking,” and “I think I'm probably lazier than most.” Unlike their extrinsic counterparts however, intrinsic participants tried to refrain from being judgmental about health behaviors. “I'm pretty unhealthy when it comes to eating so I can't really judge.”

Although not generally prone to thinking about health and largely unmotivated to change that status, inactive intrinsic participants were surprisingly aware of their health and fitness levels. When asked what they noticed the last time they were active they responded as follows:

“You notice how possibly out of shape you are [agreement from others, yeah definitely] like once you realize you are about to tap out after two laps around. I didn’t know I was this ... you know you didn’t know you were that out of shape so it’s just one thing you realize.”

Like the other inactive group there was some discomfort with crowded situations. “I didn’t like it, it was too packed. I don’t know if it was the time of day I went but I mean it was like everybody—like everybody who went to school here was in there it felt like.” But these participants seemed to value close personal relationships as important to being healthy. Participants referred to those relationships as “solid” and as a source of confidence. It may be those connections that make this group less penetrable to the pull of social norms and expectations

“M: what about when you see people out walking or jogging? Do you feel like you should be out walking or jogging?”

P2: No [laughing].

P3: Not at all.

P2: No.

P3: It’s more like, that’s nice [laughing].

P1: It does me. I feel like I should be out there doing that but I’m not. I’m driving in my car going to get lunch.”

It was the final remark that gives insight into a possible exception in this group. In this case, P1 was the only overweight person at that focus group. She was also the only person that expresses guilt about not being active. It is possible that the greater pressures of social norms trump the security that many of the participants in this group express about their social networks.

Table 9

*Group Differences in the Experience of Physical Activity and General Health*

	Inactive	Active
Extrinsic	<i>Self Identity, Awareness, and Self-Consciousness</i> Appearance = health Productive Social comparison/competition Not about health Activity types are gendered Aware of being judged	<i>Self Identity, Awareness, and Self-Consciousness</i> Appearance = health Being seen and known Acceptance seeking Judgmental/critical of self and others Active and exclusive/competitive Guilt as motivation
	<i>Self Identity, Awareness, and Self-Consciousness</i> Lazy, but content with friends Not healthy, not apologizing Avoid “image driven” situations Aware of being out of shape Mostly guilt free	<i>Self Identity, Awareness, and Self-Consciousness</i> Health is all encompassing Being active feels good Personal image rather than physical Embodied holistic approach to health Activity and inclusion

Table 9 provides a summary of each group’s general disposition regarding the experience of physical activity and more generally health. As posited by the logic model at the end of chapter 2, as each question was responded to the dynamic interaction of the environment, norms, and values in creating a lived experience of activity became more clear. A more in-depth discussion of norms follows addressing the next research question.

Research Question 4: To what extent, if at all, are materialistic values and physical activity related to social norms?

Research Question 4 was investigated through both quantitative and qualitative means. Social norms were significantly associated with physical activity, but not relative intrinsic orientation in quantitative analysis. Univariate regression analysis revealed that perceived injunctive norm pressure (injunctive norms and motivation to comply) was significantly related to physical activity (METminutes transformed) ( $p < .001$ ) explaining 2.7% of the variance. Similarly, perceived descriptive norm pressure (social modeling norms and motivation to comply) was significantly related to physical activity ( $p = .001$ ), explaining 2.2% of the variance. These two items, however, were correlated ( $r = .535, p < .001$ ), meaning when both variables were introduced into multiple regression there was multicollinearity, and the addition of a second, similar variable did not alter the significance ( $p = .001$ ) or improve the variance explained ( $R^2 = .028$ ) by the model. Although both types of norms were found to be significant predictors of physical activity, the instrument used to individually measure descriptive and injunctive norms was not sensitive enough to capture them as independent from one another. It could also be that participants are not able or do not differentiate between the two types of norms.

*Qualitative Analysis.* In the qualitative analysis of social norms as they relate to materialism and activity, some topics previously discussed re-emerge to be viewed through a different lens. Each group is discussed individually, and as with the other responses, a summary table is provided at the conclusion of the discussion.

Inactive, extrinsic participants quickly identified that *the strip* and *drinking* were synonymous terms as were *alcohol* and “*frat boys*.” “It’s like you can hear them talking about it in class. It’s like so who has 25 cent beers or who has dollar beers tonight. So it’s like you kinda associate them with where the beer’s gonna be.” The bars, however, were described as being largely separated by Greek bars and mixed bars, with a side note that African Americans are less

likely to go to a bar and more likely to go to a house party. This separation was explained as tradition and “just how it is.”

In terms of activity locations, “I would say it’s more the athletic people or people that are trying to lose weight or be more physically fit use the quad a lot for that type of activity.” The quad was seen as an active person’s domain, and this group perceives that a major reason to be active is to lose weight.

When asked about what health looks like or how they could tell someone was healthy the inactive, extrinsic participants responded with the following:

“P5: They are like carrying carrots in a Ziploc bag [laughter by all] and then they have like 3 bottles of water and make you feel uncomfortable eating pizza.

P3: Yeah just a handful of nonsalted almonds.

P5: Yeah. And then they are like ‘would you like some carrots?’ ‘No’ [laughter].

M: Okay. So other people—what you see other people doing, you see them eating, then you feel very self-conscious about it if they are eating healthy?

P5: Yes. Cuz I feel like ...especially if they awfully little. Then I feel like, man, maybe I should be eating healthy too. But I keep eating my pizza, cuz it was \$3 so I gotta finish it. [laughter]”

Again this shows the extrinsic group participants’ awareness of physical appearance in relation to health, and potentially that in some groups social modeling can be perceived as judgment or guilt inducement. The norm that if someone was thin they have no need to be active was identified, and unquestioned, within this group, and here was combined with the importance of being seen in given locations:

“She didn’t want to work out but she was skinny so she really didn’t need to work out. But she basically went you know just to be seen. She’d go in there like she was saying with her hair down, make up, lip gloss, heels, mini skirt just trying to be seen.” Appearance was also given as an important element of and motivation for many people that choose to exercise in traditional fitness environments:

“P4: Cute outfit. [agreement and laughter]. I know some people lay out their clothes to go to the rec. I mean like are you seriously like trying to find an outfit for the rec. ‘But there are cute guys there.’ Oh ok, but are you trying to work out. So like I know people will get their tights and they just really get an outfit together... jewelry like what the heck are you doing with jewelry at the rec.

P3: Making sure their makeup looks good.

P5: Earrings and mascara.

P4: Yes. So some people go for a show. So I think some people the outfit is important [agreement].”

Additional comments were, “I just notice a lot of skinny people. More than anything yeah. I notice a lot of small people. I can’t stand that,” and the following:

“P5: I think a lot of people now don’t work out to be healthy they work out just to be there.

P3: It’s an image. Definitely an image.

P1: It helps your attractiveness.

P5: (interjects) That is the only reason why I work out.

P1: Which can make things in life a little easier.

M: So you equate attractiveness to success?

P4: Hmmm

P1: No I just know that studies show that more attractive people get promoted faster, get better jobs, people treat them a lot better, I mean it's just how the world is."

Awareness of appearance and conformity (they all "looked alike, dressed alike") seems to be a strong norm for this group. Although they are quick to say these beliefs are not their norm, their discussion often belies that assertion: "Like I always have to be aware of what's around me and what's going on [to be sure] I'm in my place."

Because physical activity was seen as largely something to be undertaken in order to be seen, to result in weight loss, and only worth the amount of time relative to improvements in appearance, it was no wonder that this group expects distraction from activity to be the norm. Music was seen as an essential asset to distract one from thinking about time. Similarly, social support for was seen as an accessory to pass time and increase visibility, much less for encouragement in the pursuit of health. Activity was a means to an end, to be endured and hopefully gotten over with as quickly as possible.

Active, extrinsic participants were quickly able to stereotype behavioral norms of locations, for example Black Power Hour in the student center for the African American Greek groups. The student center was also thought to be a hang out for International Students. Finally, bars were segmented by social groupings (which was an indirect way of saying people self-locate by appearance or manner of dress).

"They didn't tell us that we had to dress a certain way to be in the fraternity but we looked at the older guys in the fraternities and during your pledge-ship you are only allowed to dress one way. You have a uniform you are supposed to wear. And there is nothing wrong with that because I mean I think it's funny now. But you want to be able

to dress like the older guys so much and you can't. Because you think they look nice and things like that they wear khakis and stuff and you can't. And so when you get out you think now well I can, and you want to dress nice and stuff like that."

The idea that location, conformity, and "fit" by appearance or clothing style was the subject of extensive conversation not only in relation to social settings ("it feels like 90% of the kids here are Greek") but also activity settings: "There are some people you can just tell don't come in there a lot at all based on what they are wearing. Like I seen a guy come in and he had like a collared shirt like a polo shirt he was working out in. And I was just like 'don't do that.'" Other observations include the following: girls are always on elliptical machines, the hallway with mats for abdominal work smells like a tanning bed, African American men play basketball, generally the weight room is for men, "all the huge like body builder steroid Guido type guys get really close to the mirrors so that like they can look at themselves all the time," and the genders, specifically females, have an expected dress code:

"P1: Yeah, I mean you don't expect to see a girl wearing guy shorts or like longer shorts. You expect to see them wearing the Nike running shorts now. I mean that is kinda what you expect to see. Or the black tight pants. Tights. That every girl wears now. And you expect to see them in huge shirts. Huge t-shirts.

P2: Or like sweaters or something. You don't see a girl wearing under armor like flexing in front of the mirror. You don't see that"

The active, extrinsic group also discussed other appearance-driven norms like using exercise as a response to guilt and to maintain a thin appearance, and the prevalence of so-called drinkorexics:

“P2: I think a lot of people go to the rec to compensate for all of that drinking they do. Like man I have heard girls say man I’m gonna have to go be on the elliptical for like 2 hours tomorrow because they were drinking. I was thinking wow, that is so dumb.

P1: Girls that will skip two meals to drink.

P2: Oh yeah, that is stupid.

P1: That’s stupid.

P2: Cuz then you are like don’t have any food in your stomach and you are getting wasted fast. It’s bad.

P1: Yeah, and you get sick. And who knows what could happen. A lot of things could happen when you are doing that. Not eating and then going out and drinking. You can wind up somewhere you don’t want to be.”

The active, intrinsic participants’ perception of norms were generalized and less critical. They identified groups by location such as International students at the international study building, various majors by their locations on campus, younger students located at the student center, the colesium for the athletes, and they additionally added time of day in the assertion that during the day the partiers were still in bed while the active people (seen as mutually exclusive groups) were up and about getting things done and enjoying outside locations like the Quad, Riverwalk, the University Recreation Center, or the Arboretum. They perceive the campus as increasingly active:

“You know when I first started here there were a lot less people but there were also a lot less people jogging with regularity too. We could probably go out to the quad right now and there would probably be a lot of people jogging. And you just notice that

more now. So that seems to be, I don't know, you know as a result of the little [activity] trail thing.”

Additionally, active, intrinsic participants view activity as just one facet of a healthy lifestyle:

“When I hear somebody talk about healthy lifestyles it's more than just their physical health, it's their mental health and things like that. You know. Happy relationships. Healthy relationships and things like that. I think all those factors play a role in healthy lifestyles. I just think that when someone says something about healthy lifestyle that, not that everything is perfect not necessarily everything is good but you know everything is where it needs to be.”

They perceive themselves as striving for that norm, and that to some extent health is individually defined by what brings a genuine sense of satisfaction to that person. Active, intrinsic participants also felt that people needed little more than a lighthearted “kick in the pants” to begin activity and presumed some level of enjoyment was associated with people who are regularly active because “you see the same people, over and over again” being active, and one could tell they like it “by listening to them talk about it.” This was in sharp contrast to the active, extrinsic group participants, who seems to focus more on criticism, guilt, and conformity rather than the actual enjoyment of being active.

The final group was the inactive, intrinsic participants. Although this group was certainly aware enough to connect locations with types of people or stereotypes, they were across the board reticent to do so. Their connections came about indirectly and after much discussion. In general, they associated lunchtime at the student center with older male students trying to hit on the younger girls who are there, that the library was for more serious students, and probably most

astutely that not only are drinking establishments separated by groups, they are particularly bound to certain locations by their specific social network. When it comes to norms about conformity, they are active in their disregard for conformity, although they can easily discuss how it appears within activity in traditional settings like going to the gym:

“P1: I think girls care [P6 & P4 agreement—yeah] what they wear.

P6: It’s like [inaudible].

P4: Yeah. I care to an extent but I mean it’s not like I got to have a name brand something or other on. But it’s not like I’m gonna go up there with holes in my shirt or anything like that or a hole in my shorts.

M: So you think it’s kind of gendered?

P1: I mean I’m sure guys like to make sure what they are wearing is like alright. Actually I don’t know I can’t speak for guys. I just know about girls.

P4: I think most guys do care. I think most guys do care. But I just ... I don’t really care. I’m not going up there to look pretty.

M: Why do you think that they care?

P4: Materialistic.

P1: It’s a place to socialize and meet guys.”

When asked about the importance of apparel and accessories for activity, they responded as follows:

“P6: it’s a trend. I mean once you’ve seen it. Like majority of the girls on campus if they are all going to wear a Northface jacket or whatever, everybody has those.

P4: Yeah, probably on average yeah.

P1: The Nike shorts.

P6: Yeah the shorts everybody has those. The tennis shoes or you know the Ugg boots. It becomes the norm what the trend is. You know the average student is going to see that, so therefore the average student is going to have the same things going on.

P1: Same with working out, it's a trend.

P6: They be like, 'oh they have iPods when they go work out,' well you know maybe I should take my iPod to the gym. And it just becomes the thing you know that most people seem to do and I think that's how that kinda sparks up."

However they are clear that they have absolutely no desire to participate in any of those trends. Another trend they have no desire to participate in was that of the topic of activity as it relates to weight loss. The discussion of weight loss through exercise was a dominant theme for their extrinsic counterparts, but it would appear that students who are more intrinsically motivated find this discussion uncomfortable:

"P2: Yeah I feel like if everybody around you is motivated to go work out just to lose weight or something and I don't really feel like that pertains to me then I am just not gonna forget about why I need to go because every body is talking about going to lose weight. And then you start to think that is why you work out. But I mean you KNOW deep down inside that isn't why.

P3: Yeah I agree. It makes me uncomfortable too, to talk about. Yeah it makes me really uncomfortable when people talk about like how they need to go lose weight, because I just don't know what to say back to that because I don't and then they will come back with like, 'oh my god you don't work out and you are so skinny.' That makes me uncomfortable because I don't know what to say to that. Sorry. I don't know. The

whole working out and losing weight thing is something I don't want to be a part of.

[laughing] like that whole conversation. I don't like it.

P2: I know what you mean. And you are like. I don't know I feel like if you say something about working out and you are small somebody is gonna call you anorexic.

P3: I totally agree. Cuz even when I say somebody will bring something up about working out and I will just be like oh. I don't like working out. They will be like, 'oh you don't need to [snarkily].' I'll just be like, oh. They will be like, 'you don't need to lose any more weight,' and I will just be like, 'okay.' So then I associate you associate weight with working out. But I could be like, 'oh I just want some serious muscle on my legs.' But to them you are about to lose like 10 pounds if you bicycle for an hour.

P2: Yeah, I think a lot about what people say has to do with why people either work out or don't.

P3: Cuz even on the commercials they are like buy this to lose weight or this video to lose weight.

P2: They never say it's good for your cardio.

P3: Yeah yeah [laughing] work out to be healthy."

Although professing no interest in activity, this group was very aware of media portrayal and normative pressures surrounding physical activity. In spite of assuming that "90%" of working out for their peers was body image driven they, like their active, intrinsic counterparts, they did assume some level of enjoyment was gained from activity (again in contrast to the critical perspective of extrinsic orientation) because they couldn't imagine doing something that they didn't like with any regularity.

Table 10

*Summary of the Confluence of Social Norms, Materialism, and Activity*

	Inactive	Active
	Location and behavior	Location and behavior
Extrinsic	Appearance	Appearance
	Conformity—Tradition	Conformity—Image
	Location and behavior	Location and behavior
Intrinsic	Discomfort with image conformity	Health is individually defined
	Assumption of enjoyment	Assumption of enjoyment

Research Question 5: Are materialistic values a barrier and/or facilitator of physical activity?

Research Question 5 was addressed through both quantitative analysis as well as qualitative methods. Barriers were categorized as external, internal, and personal as per D. M. Williams et al. (2005). External barriers are those things like lack of access to facilities, transportation, or money that might keep a person from being active. Personal barriers include lack of time or social support, injury or sickness, and fear of injury that might keep a person from being active. Lastly, internal barriers were described as lack of motivation or desire, or feeling self-conscious that might keep a person from being physically active.

*Quantitative Analysis.* Each type of barrier was investigated via one-way ANOVA, initially using physical activity as the dependent variable, and then using materialism as the dependent variable. Assumptions of normality were satisfied through viewing skewness, kurtosis, histograms, and plots for each analysis. This analysis was done to familiarize the

researcher with potential differences between groups as might be seen in focus group data. The results of the ANOVA analyses can be found in Tables 11 and 12.

Table 11

*One-Way ANOVA for Physical Activity and Barriers to Physical Activity*

	<i>n</i>	<i>M</i>	<i>SD</i>	Sig.	<i>R</i> <sup>2</sup>	Linear Trend
<b>Internal Barriers</b>						
Never	71	89.373	42.258	<i>p</i> < .001	.071	<i>p</i> < .001
Almost Never	103	86.485	36.715			
Sometimes	198	73.394	33.672			
Almost Always	78	63.265	34.667			
Always	32	57.821	39.535			
<b>Personal Barriers</b>						
Never	71	79.670	43.028	<i>p</i> = .002	.035	<i>p</i> = .003
Almost Never	130	82.993	37.572			
Sometimes	199	75.418	35.367			
Almost Always	54	60.804	26.782			
Always	28	64.912	41.607			
<b>External Barriers</b>						
Never	189	73.385	38.784	<i>p</i> = .067	-	-
Almost Never	138	81.873	33.532			
Sometimes	124	73.100	35.510			
Almost Always	24	65.935	43.481			
Always	8	94.608	62.398			

Table 11 demonstrates the one-way ANOVA results exploring the relationship of barriers to physical activity to physical activity (dependent). Internal barriers such as lack of motivation or desire or feeling self-conscious had a statistically significant relationship (*p* < .001) and linear trend (*p* < .001) with physical activity, explaining approximately 7% of the variance. Personal barriers such as lack of time or social support, injury, sickness, or fear of injury also had a statistically significant relationship (*p* = .002) and linear trend (*p* = .003) with physical activity, explaining approximately 3.5% of the variance. External barriers such as lack of access to facilities, transportation, or money did not have a significant relationship with physical activity.

As seen in Figure 4, internal barriers (lack of motivation or desire, or feeling self-conscious) have a linear relationship with physical activity. Bonferroni multiple comparisons showed that respondents who answered that internal issues were “never” barriers to their physical activity were significantly more active than those who answered “sometimes” ( $p = .015$ ), “almost always” ( $p < .001$ ), and “always” ( $p = .001$ ). Similarly, those who answered internal issues were “almost never” a barrier to their physical activity were significantly more active than those who answered “sometimes” ( $p = .031$ ), “almost always” ( $p < .001$ ), and “always” ( $p = .001$ ). In general, the most active respondents were more likely to indicate that they never or almost never were prevented from being active by internal barriers. Conversely, the least active participants were the most likely to feel that their activity was impeded by internal barriers.

As Figure 5 demonstrates, personal barriers (lack of time or social support, injury or sickness, and fear of injury) were shown to have a linear relationship with physical activity participation, although this plot is less clear than the previous. Bonferroni multiple comparisons showed that participants who responded that personal barriers were “never” a barrier to physical activity were significantly more active than those who responded “almost always” ( $p = .047$ ). Similarly, participants who answered “almost never” were significantly more active than those who responded “almost always” ( $p = .002$ ). In general, similar to the previous plot, the most active respondents were more likely to indicate that they “never” or “almost never” faced personal barriers to physical activity. Conversely, the least active participants were the most likely to feel that their activity was impeded by personal barriers.

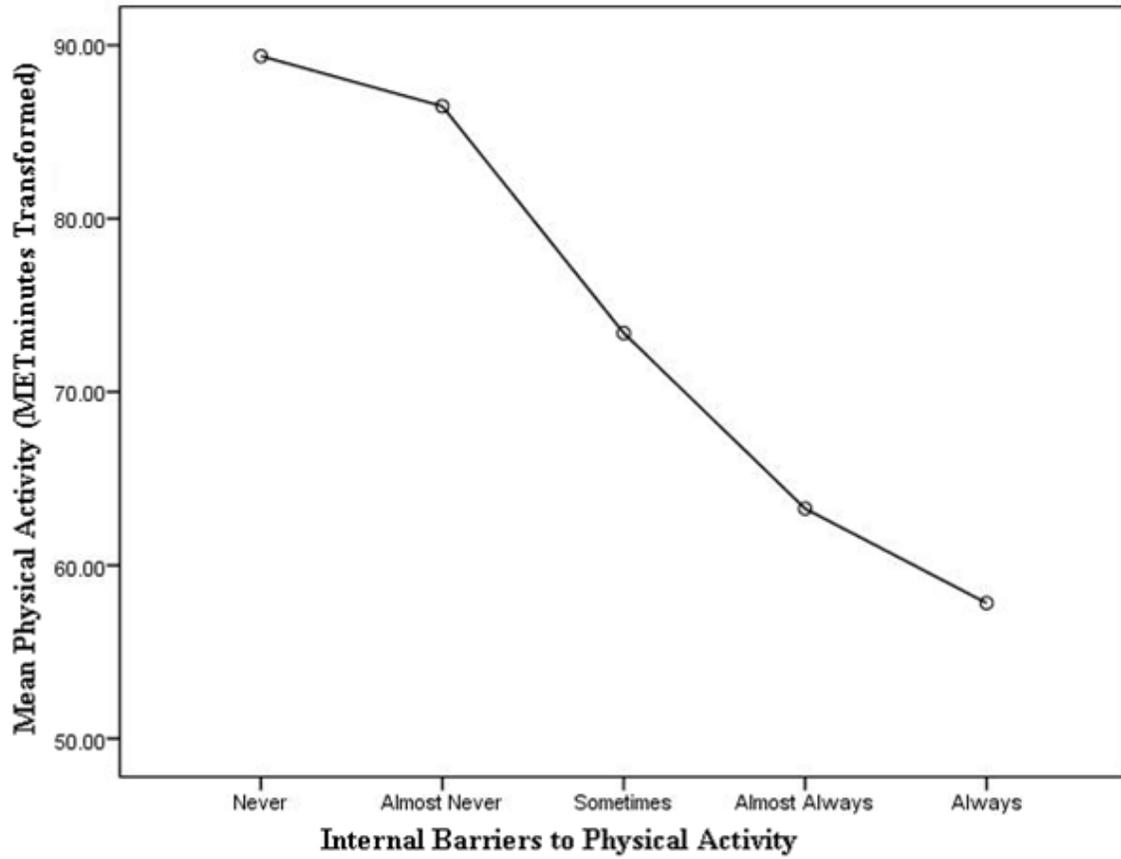


Figure 4. The relationship of internal barriers to physical activity.

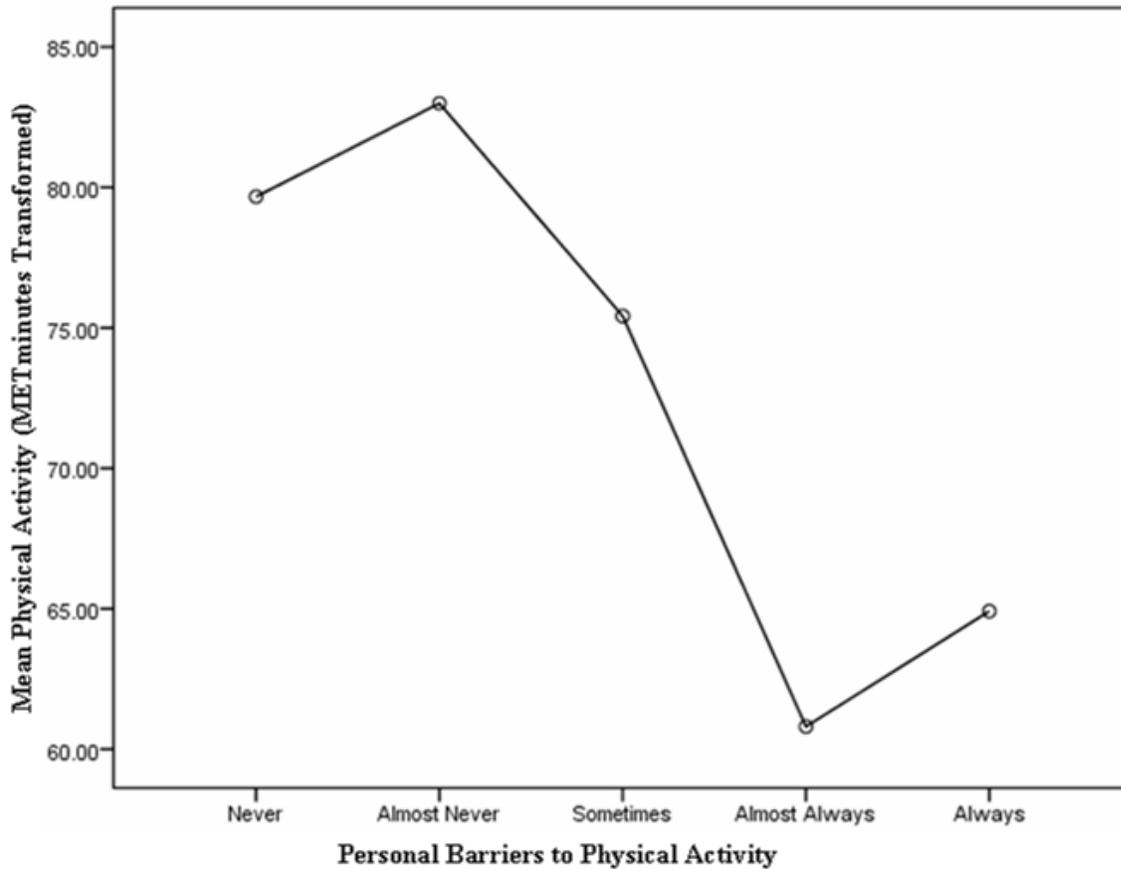


Figure 5. The relationship of personal barriers to physical activity.

Table 12 demonstrates the one-way ANOVA results exploring the relationship of barriers to physical activity and materialism (dependent). Neither internal barriers (lack of motivation or desire, or feeling self-conscious), nor personal barriers (lack of time or social support, injury, sickness, or fear of injury) had a statistically significant relationship with materialism. External barriers such as lack of access to facilities, transportation, or money had a statistically significant relationship ( $p < .001$ ), and linear trend ( $p < .001$ ) with materialism, explaining approximately 4% of the variance.

Table 12

*One-Way ANOVA for Materialism and Barriers to Physical Activity*

	<i>n</i>	<i>M</i>	<i>SD</i>	Sig.	<i>R</i> <sup>2</sup>	Linear Trend
Internal Barriers						
Never	71	1.701	1.019	<i>p</i> = .566	-	-
Almost Never	103	1.757	0.990			
Sometimes	197	1.918	1.109			
Almost Always	78	1.788	1.112			
Always	32	1.887	1.319			
Personal Barriers						
Never	71	1.806	1.170	<i>p</i> = .907	-	-
Almost Never	129	1.789	0.952			
Sometimes	199	1.829	1.073			
Almost Always	54	1.942	1.123			
Always	28	1.927	1.415			
External Barriers						
Never	189	1.952	1.126	<i>p</i> < .001	.041	<i>p</i> < .001
Almost Never	137	1.866	1.007			
Sometimes	124	1.741	1.016			
Almost Always	24	1.441	1.293			
Always	8	.422	0.545			

Figure 6 shows the means plot and linear trend for the relationship of external barriers and materialism. Bonferroni multiple comparisons showed that participants who indicated that they “always” faced barriers were significantly more materialistic than those who indicated that they “never” ( $p = .001$ ), “almost never” ( $p = .002$ ), or “sometimes” ( $p = .008$ ) faced external barriers to activity.

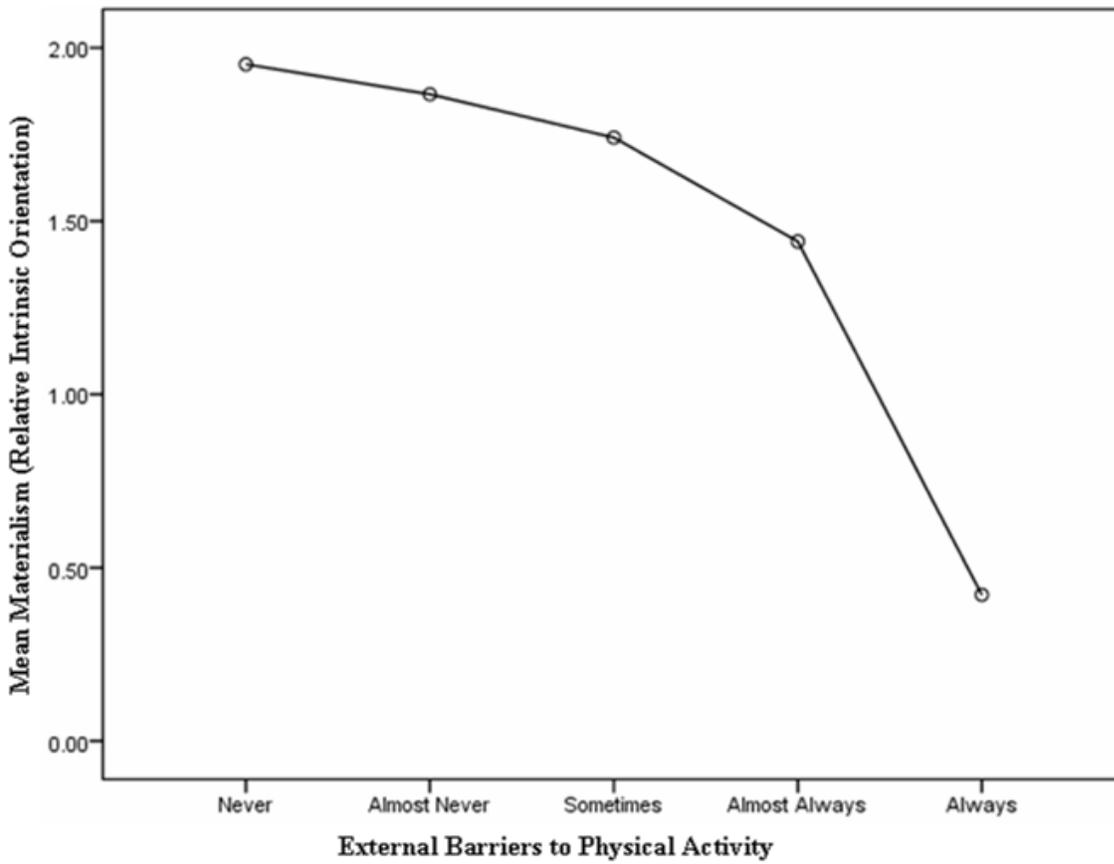


Figure 6: The relationship of external barriers to physical activity to materialism.

Lastly, three versions of Analysis of Covariance were run with physical activity (dependent variable), relative intrinsic orientation (covariate), and each type of barrier. The ANCOVA with external barriers was not found to be significant (relative intrinsic orientation,  $p < .001$ ; external barriers,  $p = .085$ ). The ANCOVA with internal barriers was significant (relative intrinsic orientation,  $p < .001$ ; internal barriers,  $p < .001$ ) and explained 8% of the variance. As with the ANOVA model given previously, Bonferroni multiple comparisons showed that respondents who answered internal issues were “never” barriers to their physical activity were significantly more active than those who answered “sometimes” ( $p = .021$ ), “almost always” ( $p < .001$ ), and “always” ( $p = .001$ ). Similarly, those who answered that internal issues were “almost never” a barrier to their physical activity were significantly more active than those who answered

“sometimes” ( $p = .039$ ), “almost always” ( $p < .001$ ), and “always” ( $p = .001$ ). In general, the most active respondents were more likely to indicate that they never or almost never faced internal barriers. Conversely, the least active participants were the most likely to feel that their activity was impeded by internal barriers.

The ANCOVA with personal barriers was significant (relative intrinsic orientation,  $p = .027$ ; personal barriers,  $p = .003$ ) and explained 4% of the variance. Bonferroni multiple comparisons indicated that persons who “never” faced personal barriers were significantly different from those who “almost always” faced barriers ( $p = .003$ ).

*Qualitative Analysis.* In the summary table (Table 13) at the end of this section, the reader may note that barriers and facilitators of activity were very similar across groups. When asked “what makes being active easy or more difficult,” each group’s participants responded not only in terms of themselves but also for the average student. Although these expressions of barriers and facilitators are similar, the experience of a given barrier or facilitator is likely not. For example, as found in the second section of this chapter (Research Question 2, regarding location), distance was more likely to be seen as prohibitive by inactive people. Inactive participants with perimeter parking passes felt as though they “have to take the bus” because it would “take all day to get in to campus,” whereas an active person may more easily choose self-transportation. And although an inactive person might list having to walk to class as a facilitator of activity, that did not mean they regularly engaged in that activity if it was avoidable (“I used to walk everywhere, but then the busses came and it was out the window”).

Furthermore, although weight loss seems to be a motivational factor (facilitator) for both active and inactive participants with extrinsic orientation, that item could also be listed as a barrier for persons who are already thin or those that have recently reached a weight loss goal;

they may feel no need to be active because they don't need to lose weight ("I had stopped for a while because I had lost weight and I was like 'I really don't have to work out anymore' and that messed me up"). And in the case of the previous question response the inactive, intrinsic orientation participants were uncomfortable with the activity–weight loss connection, and it functioned as a strong barrier. This is a potent reminder regarding health messages: What might work for some may also disenfranchise others. In this case, it is separating out a group of people who need to be targeted rather than turned off by the message of activity's importance to health.

Similarly, there was split discussion of the use or enjoyment of music. Interestingly, one of the dominant reasons for using music was to "make time go by faster" (disembodying the person from the experience of activity), and the most commonly presented counterpoint was that music was a negative distraction and kept them from focusing on what they were doing (specifically being able to focus on improving one's appearance: "Makes it so you can't focus"). The use of music to increase enjoyment of activity was mentioned but far less representative of the common thoughts about this topic. In this way, music could be both facilitator and a barrier by personal preference. There did not seem to be consensus by group about use of music preferences.

Generally speaking, all participants were able to identify barriers and facilitators to activity and more broadly to healthy behaviors. Inactive persons more readily expressed barriers and had more extensive lists of barriers, whereas active persons had an easier time finding and expressing facilitators to activity.

Table 13

*Barriers and Facilitators of Activity and Healthy Behavior*

	Inactive		Active	
	Barrier	Facilitator	Barrier	Facilitator
Extrinsic	<i>Internal</i> - Too tired - Procrastination - Not enough payoff for activity - Don't fit socially	+ Have to walk to class  + Safe campus  + Good weather	<i>Internal</i> - Too tired - Don't fit socially - Weight loss only, stop at goal	+Enjoy exercise  + Good weather  + Motivation
	<i>Personal</i> - Time - Schedule not conducive	+ Social Support	<i>Personal</i> - Peer pressure - Time	+ Self Discipline
	<i>External</i> - Safety - Healthy is expensive, not convenient - Distance/parking		<i>External</i> - University not supportive enough of activity - Healthy food not convenient -Safety	
Intrinsic	<i>Internal</i> - No motivation - Overweight are self-conscious, and weight focused - Procrastinate - Don't fit socially	+ Have to walk some to class  + Good weather  + Extensive social networks and social support	<i>Internal</i> - Appearance focused	+ Have to walk to class
	<i>Personal</i> No time	+ Free to students	<i>Personal</i> - Time -Peer Pressure	+ Facilities near  + Lots of machines
	<i>External</i> - Bus available - Healthy is expensive, not convenient - Safety - Cold weather - Emphasis on weight		<i>External</i> - Healthy food not convenient - Safety - Gym is crowded - Bad weather	+ Free for students  + Good weather  + Lots of group social support  + Feels good
				+ Lots of parks & resources for activity

## CHAPTER 5

### DISCUSSION

#### Introduction

The majority of American adults do not engage in enough physical activity to satisfy public health recommendations, in spite of clear and much publicized health benefits (Centers for Disease Control, 2008). More than 50% of adults in America are not sufficiently or regularly active enough to meet recommendation levels, and one quarter of adults can be categorized as sedentary. States in the southeastern region of the United States, specifically Alabama, Mississippi, and Louisiana, are among the least physically active states with only 41.7%, 39.6%, and 38.6%, respectively, of their adult populations meeting physical activity participation recommendations (Behavioral Risk Factor Surveillance System, 2007). However, the root of health and well-being is not simply the physical aspects of health. In the present study, physical activity has been treated as the dependent variable to be influenced by a variety of other factors to be discussed here.

In recent years, increased attention has been paid to social position, consumption, well-being and health (Carlisle et al., 2008). The contagion of conspicuous consumption (Shukla, 2008) only furthers the progression of inequalities in society, with broad implications for mental and physical health and well-being (Carlisle et al., 2008). Given the enormous societal pressure to consume, some individuals attempt to satisfy their identity needs through materialism (Dittmar et al., 2007), and many become ensnared in a debt cycle that brings stress and possibly devastation to their lives (Varman & Belk, 2008), resulting in the reduction of quality of life and

health. As the relationship between materialism and physical activity, which subsequently influences health, is more clearly understood there is the potential for understanding how materialistic values influence health outcomes across a lifespan.

The purpose of the study was to gain a better understanding of how materialistic values interact with the social and physical environments to influence physical activity participation, location, and the experience of being active. Although this study represents a relationship that had not yet been explored, the substantial body of literature presented suggests that persons with high materialistic aspirations are less happy, more dissatisfied with their lives, and have lower rates of mental well-being than those who are less materialistic (Burroughs & Rindfleisch, 2002). Although an ever-growing and substantiated body of literature regarding materialism and its relationship with psychosocial well-being exists, relatively little is understood about how those two variables interact within the bigger context of life values (Burroughs & Rindfleisch, 2002) and sociocultural determinants of health (Eckersley, 2001). This study has attempted to begin a discourse through both quantitative and qualitative means regarding materialistic values and how they interact with other physical and social environmental variables to influence subsequent health behaviors, specifically choices surrounding physical activity participation.

#### Sample Population

The sample population was comprised of predominantly Caucasian, single, female, university students who were between 18– 24 years of age. Most of these students were in-state residents (70.2%) who lived on (34.9%) or within 2 miles of (45.7%) campus. Additionally the majority of participants indicated that they were not responsible for any basic life expenses such as medical insurance (84.5%), auto insurance (80.3%), tuition (66.0%), or living expenses such

as rent or dorm costs (62.8%), and were not presently employed (59.8%) or did not expect to work in the summer months (21.9%).

Although perceived contributions to other expenses such as other school expenses, gas and vehicle costs, food, clothing, and entertainment varied across the sample, perceived contributions to basic expenses indicate that this was largely a population that lives as financial dependents of a guardian. The extent to which dependent status and degree of dependency influences values was not clearly understood and was not measured in the present study. Some research suggests that those with consistently high socioeconomic positions and upward mobility are more likely to have increased activity and fitness levels (Cleland, Ball, Magnussen, Dwyer, & Venn, 2009). However, some might propose that in terms of life satisfaction the perception of sufficiency (an inherently values-based perception) may be more important than the actual amount of financial resources, while acknowledging that actual financial resources do provide a buffer from potentially negative environmental life events (Cummins, 2000; Johnson & Krueger, 2006).

It was anticipated that perception of financial related values changes over time as an individual's understanding of and responsibility for their financial situation increases. The original sample included participants enrolled as students who were older than 24 years of age. A two-sample independent *t* test determined that those 24 years of age or older were different from the traditional college student in both their values (older group was less materialistic) and their physical activity levels (older participants were less active). Therefore, the sample was restricted to those between 18 and 24 years of age.

## Theory

As discussed in chapter 2, the present study utilized the IBM theoretical framework; specifically the constructs considered in the analysis were injunctive and descriptive norms, and self-efficacy. Perceived norm is the broad construct including both injunctive and descriptive norms as well as an individual's perception of social pressure to perform (or not perform) a given behavior. The IBM suggests that injunctive norm by itself is incomplete, because it does not allow for the influence of what the individual *sees* others doing. Descriptive norm includes modeling and social identity. In other words, the stronger an individual's perception of referent pressure and referent modeling is, the stronger the sense of pressure to comply (Montano & Kasprzyk, 2008). Norms are most directly addressed in response to Research Question 4: "To what extent if at all, are materialistic values and physical activity related to social norms?"

*Personal agency* is the IBM construct comprised of perceived control and self-efficacy. Perceived control is the amount of control individuals feel about their performance and is largely influenced by the strength of perceived facilitators or barriers within the environment that was addressed in response to Research Question 5. Self-efficacy was used in a manner consistent with Bandura's definition: an individual's level of confidence in his or her ability to successfully perform the behavior (Montano & Kasprzyk, 2008) and was addressed in several of the responses to the research questions. As indicated in chapter 2, the literature using this new theoretical model is sparse, the majority of which is related to condom use and HIV prevention techniques. The specific constructs used in analysis here are discussed in greater detail where appropriate in response to the research questions.

## Research Questions

Research Question 1: Do materialistic values impact participation in physical activity?

This question was addressed through quantitative means. Preliminary investigative analyses were conducted so as to satisfy both the need to understand the quantitative relationship between materialism, physical activity, and other variables known to be related based on previously discussed literature, as well as the need to develop categorical groupings for focus group recruitment. Relative intrinsic orientation and physical activity scores were used to determine categorical status for focus groups (active extrinsic, active intrinsic, inactive extrinsic, inactive intrinsic).

The Pearson correlation coefficients for the primary topic of physical activity, minutes sedentary per day, life satisfaction (LS), general self-efficacy (GSE), physical activity self-efficacy (SEPA), and physical activity social support (PASS) are given in Table 6. Generally, this study focused on the use of physical activity (METminutes transformed) as the dependent variable, and the other aforementioned additional variables as independent or predictive variables. It was essential, however, for Table 5 to be included because this study marks the first to investigate the potential relationships between materialism and physical activity and other constructs that are known through the literature to be associated with physical activity. As an opening inquiry it was important to gain understanding of how each materialism construct interacted with the various other constructs included in this study.

The results shown in Table 5 were consistent across subscales in the directions expected based on the literature (for example, SEPA was positively associated with the Aspiration Index [AI] fitness subscale). The key findings of this comparison are that relative intrinsic orientation was negatively associated with activity; that is to say the more materialistic (extrinsic)

participants were more active. Conversely, the more sedentary participants were less materialistic (intrinsic). Life satisfaction was positively associated with less materialistic orientation (all of the intrinsic subscales), whereas it was negatively associated with increased levels of materialism (all of the extrinsic subscales). That is to say, participants who were more satisfied with their lives prioritized interpersonal relatedness (intrinsic values), but were less physically active. Participants who were more physically active were also more materialistic and less satisfied with their lives.

General self-efficacy did not have any significant correlations with the other variables. Physical activity specific self-efficacy (SEPA) and physical activity specific social support (PASS) were only associated with the AI fitness subscale. As mentioned previously, the magnitude of these correlations were not strong but they were statistically significant and therefore warrant a closer investigation to understand how, why, and to what extent these constructs are associated.

The next step was to examine the relationships between the primary construct of physical activity and the other constructs of interest. As would be expected, physical activity had a moderately strong negative association with daily sedentary minutes. Although sedentary behavior has an acknowledged potential for mirroring results (time being sedentary can not also be time being active), it is not a perfectly clear relationship. Sedentariness and activity are not always mutually exclusive or determined, and sedentary behavior has developed its own body of literature linking it to health outcomes (Healy et al., 2008; Matthews et al., 2008; M. Nelson & Gordon-Larsen, 2006; Owen et al., 2009). Therefore, both activity and sedentariness are retained throughout the analyses and subsequent discussions. One example, from a large reference study, of their simultaneous retention is the Eurobarometer Study (Sjostrom, Oja, Hagstromer, Smith, &

Bauman, 2006). The authors asserted that “the prevalence of sedentariness across the countries was in general the mirror image of the prevalence of sufficient activity” (p. 294) however, the researchers continued to report values for both variables as they are not perfect mirror images of each other.

Physical activity was weakly associated with general self-efficacy and social support, and moderately with physical activity specific self-efficacy. These findings keep with the dominant body of literature that suggests general self-efficacy (Luszczynska, Scholz, & Schwarzer, 2005; Sarkisian, Prohaska, Wong, Hirsch, & Mangione, 2005) self-efficacy of physical activity (Anderson, Wojcick, Winett, & Williams, 2006; Doerksen, Umstatted, & McAuley, 2009; Trost et al., 2002; Umstatted et al. 2006; Umstatted et al., 2008; Wallace, Buckworth, Kirby, & Sherman, 2000) and the presence of social support (Ainsworth et al., 2003; Anderson, Wojcick, Winett, & Williams, 2006; Bauman et al., 2002; Brownson et al., 2001; Kim & Sobal, 2004) increase physical activity participation.

Regression analysis was then conducted to clarify the relationships further. Stepwise regression determined two models (physical activity as dependent variable, relative intrinsic orientation, minutes sedentary per day, PASS, and SEPA;  $n = 461$ ), which were both significant. The strongest predictor given in the first model was minutes of sedentary behavior per day. The second model included SEPA and increased the fit of the model. Because relative intrinsic orientation and sedentary behavior were significantly correlated, and to avoid the potential for mirror images of time (previously discussed), sedentary behavior was removed from the model and an additional stepwise regression ( $n = 463$ ) was conducted with physical activity (dependent variable), relative intrinsic orientation, PASS, and SEPA. This analysis also returned a two-step model where both models were significant. The strongest predictor in the model was physical

activity specific self-efficacy followed by relative intrinsic orientation. The fit of the model showed slight improvements in explanatory power. These findings demonstrate that self-efficacy of physical activity was an important predictor of physical activity level in congruence with findings established in the literature (Anderson et al., 2006; Doerksen et al., 2009; Trost et al., 2002; Umstatted et al. 2006; Umstatted et al., 2008; Wallace et al., 2000). A new finding was that materialism (relative intrinsic orientation) may also be a valuable construct to consider when trying to explain physical activity engagement.

The current study marks the first time the relationship between materialistic orientation and physical activity has been reported. The most similar published study conducted by Piko (2006) examined activity and health behaviors (smoking, drinking, drugs) against a health value scale with some similar constructs to the AI such as finances, social prestige, fitness, friendship, and career. This study found that those with a fitness orientation were more likely to be active, but the orientation did not predict adverse health behavior. Participants with a more social orientation (closest to intrinsic values) were less likely to smoke, drink or use drugs; and those with an achievement or career orientation (most like extrinsic values) were most likely to engage in risky health behavior (drinking, smoking, or drug use) potentially as a method of coping with associated increase in perceived stress (Piko, 2006).

Research Question 2: Do materialistic values influence the selection of physical activity location?

This research question was addressed qualitatively by investigating how, when, where, and why participants choose to be, or not to be, active. Each group represented a relatively homogeneous group in reference to relative materialistic orientation and activity status.

Substantive qualitative investigation helped to clarify what and how various factors influenced physical activity location.

Location accessibility, as a basic tenet, is a key to increasing rates of physical activity (Diez Roux, 2003; Tucker et al., 2009). In the current study, access was a constant for students, as all students presumably are free to utilize any campus open spaces as well as campus recreation facilities. These locations may be more or less convenient based on housing location or perceived distance, but again at a basic level all students have been afforded access. It is widely held that communities who provide access are more likely to engage their community members in activity (King, Stokols, Talen, Brassington, & Killingsworth, 2002), although this assertion is not without contradictory findings (Witten, Hiscock, Pearce, & Blakely, 2008).

Between-group differences emerged through the qualitative analysis. Differences regarding type of activity, and location context, were seen between the contrasting materialistic orientations (extrinsic versus intrinsic). Differences between active and inactive categories were seen through the requisite differences in levels of physical activity engagement, the desire or acceptability of self-transportation, and perceptions of distance.

#### *Differences by Materialistic Orientation: Location Type and Location Context*

Between group differences emerged among materialism categories. Differences in activity location type (traditional gym or sport locales versus nontraditional or nonsport oriented locations) and the location's subsequent context (performance based, competitive, and level of visibility of the environment) were observed. Extrinsic participants (active and inactive) indicated that they preferred or participated in traditional gym and sport-based activities predominantly at campus recreation facilities. The preference for traditional exercise environments (goal-oriented or competitive environments with potentially higher visibility) was

a characteristic found within both active and inactive participants with extrinsic orientations. Participants categorized as active and extrinsic had a preference for competition. The inactive, extrinsic group participants seemed less eager to compete, but no less competitive. Conversely, participants with intrinsic orientations indicated preference for more nontraditional location types, less or noncompetitive, and alternative locations for activity. Although the active intrinsic participants did use traditional locations for activity, they placed more emphasis on environments that they could use or enjoy with friends who were play oriented and noncompetitive in nature.

Another characteristic of location context was visibility. In the current study, participants with extrinsic orientations had the expectation of “being seen” in the activity location and often attached group identity to various locations (“my group would never be active on the quad”). Although both inactive and active extrinsic participants were aware of location as it pertains to social visibility, the inactive group was more likely to take steps to attenuate their visibility by selecting a more private location (moving to the back row of machines, or going to an alternative location). Other studies suggest that women with higher social physique anxiety are more likely to exercise in a more private location (Spink, 1992). Spink speculated that this may be a reflection of the attempt to prevent being “seen” or evaluated. Similarly, Sugiyama, Shiraki, and Ichimura (1994) found that personality characteristics regarding desire for visibility influenced practice location for golf athletes in a group practice setting. Given that the extrinsic group participants were vocal about being judgmental of peers (discussed further in Research Question 3), it was not entirely surprising that this awareness of visibility influences their behavior. Individual characteristics related activities are discussed in Research Question 3; however, pertinent to the question at hand was how locations associated with traditional activities may

have a climate or context that was more or less attractive to persons with different values orientations.

The literature regarding location preference by activity type and environmental context is not particularly clear. Ham, Kruger, and Tudor-Locke (2009) reported that although prevalence in all forms of physical activity is low, exercise is the most often reported activity type without regard to physical location of the exercise. Prichard and Tiggemann (2008) further suggested that regular activity in fitness center environments was more highly related to body image and eating disturbance than activity regularly performed outside of that environment. Ntoumanis and Biddle (1999) found that environments focused on skill mastery were most likely to encourage adaptive motivation, whereas performance-oriented environments were less adaptive, maladaptive, or created negative affective responses. These findings however were mitigated by their acknowledgment that little is known about the specific situational or personal variables that could moderate those relationships. The ambiguous findings and lack of literature suggest the importance of the present type of inquiry, where an attempt has been made to move beyond basic connections describing the built and physical environment and their association with activity, and move toward understanding the contextual environment the built environment can create.

Although the concept of environmental context is more clearly understood from an urban planning and architectural perspective, it has not been strongly connected in health related literature. One area where an attempt has been made to connect these disciplines through literature is active transport. Sallis, Frank, Saelens, and Kraft (2004) published a paper with the goal of connecting transportation and planning literature with health literature. Although the integration of research continues to improve our understanding, environmental context is

something not fully understood as of yet. This issue of active or self-transportation is, however, of interest in regard to differences found by activity level.

*Differences by Activity Level: Self-Transportation and the Perception of Distance*

Because groups were divided according to both materialistic orientation as well as activity level, it follows that differences between activity groupings would emerge. Qualitative findings support the accuracy of the method used for separating activity categories as there was a large discrepancy in activity between the groups. Active participants (both extrinsic and intrinsic) found it easy to report a variety of activities in which they participated, as well as the corresponding locations of activity. The inactive group (both extrinsic and intrinsic) could name activities (and corresponding locations) they had previously enjoyed, or enjoy periodically, but were less able to list activities in which they were regularly involved.

The largest differences (besides that actual activity level itself) between groups were found in attitudes toward self-transportation and the perception of campus distances. How students negotiated campus distances appeared, in the present study, to vary based on self-reported activity level. The inactive group perceived campus distances as largely prohibitive to active transportation (“It would take all day to get in to campus,” “I would never walk that far”), whereas active groups were more likely to walk especially for short distances (“I’ve always liked to walk”). Interestingly, active extrinsic participants although priding themselves on activity level often drove themselves to work out, which could possibly have some relationship to group identity, visibility, or reliance on material items, but those ideas are conjecture.

Self-transportation is known to contribute significantly to accumulated physical activity (Saelens et al., 2003). Research has reported that accuracy of distance perception, when considering both perceived and objective measurements of neighborhood attributes, is improved

in closer distances (Hoehner et al., 2005; Kirtland et al., 2003; Kweon, Ellis, Lee, & Rogers, 2006). Yet there is a lack of information regarding how individuals perceive distances differently based on individual characteristics or activity level. There is, however, a substantive amount of literature that helps shed light on distance as a facilitator or barrier of active transportation.

For example, some research has demonstrated that physical environments can shape activity through increased walking when there are increased proximal destinations (McCormack, et al., 2004), which thereby increases walking for self-transportation (Rodriguez, Khattak, & Evenson, 2006). This suggests that increase in self-transportation is particularly salient for distances of less than one mile (Handy, Boarnet, Ewing, & Killingsworth, 2002). A study of active commuting of school-aged adolescents (15-17 yrs of age) found males and those living in more densely populated areas to be more likely to actively commute (walk or bicycle). After controlling for gender and density, the study found a one-mile increase in commuting distance decreased the likelihood of active transportation by 71% (N. M. Nelson, Foley, O’Gorman, Moyna, & Woods, 2008). Further, some research suggested that each kilometer of active commuting was associated with a decrease in likelihood of obesity, whereas time spent car commuting is positively associated with the likelihood of obesity (Frank, Andresen, & Schmid, 2004). Destination proximity and self-transportation are key concepts in a campus environment where students have multiple destinations within a proximal radius. These findings lend evidence that location (type, perceived environments, and mode of transport) may be related to and explained by connections to materialistic orientation. This link could be approached proactively for intervention from both the planning and design standpoint as well as a social marketing campaign strategy in an attempt to shape both the physical environment and the social context therein.

Research Question 3: Do materialistic values influence the individual's experience of physical activity?

This research question was addressed through quantitative and qualitative means. The premise of the question was meant to address participants' own feelings, awareness, and self-consciousness or self-confidence while they were being active. This question builds on the information gathered through the previous questions in an attempt to describe in a more meaningful way how people simultaneously experience the environment, norms, and personal values.

Hamilton and White (2008) synthesized the literature to describe the difference between social identity and self-identity as a predictor of intention and physical activity behavior. Social identity is where an individual constructs context-specific group norms to connect themselves with a desired social group. Persons may learn to prefer a sport or activity that symbolizes their desired social identity (Sadalla, Linder, & Jenkins, 1988). Self-identity is the extent to which an individual feels a given behavior is a core value or part of "who they are" (Hamilton & White, 2008). Wetter et al. (2001) suggested that self-identity reaches beyond the self to shape the determinants of behavior and subsequently the behavior itself. Thereby, if behavior recommendations are not congruent with an individual's self-identity, environmental cues or interventions to create behavior change may be ineffective.

Self-identity (self-standard of fitness) was the strongest predictor of physical activity in the regression models presented in chapter 4. Self-identity along with self-standard of materialism and relative intrinsic orientation had the strongest explanatory power of the models produced for this question. An example from this study is seen when the intrinsic inactive group participants viewed themselves as lazy but content with their social networks. If the findings of

this study and the literature are accurate, this group would be the most difficult group to reach in an intervention. They see themselves as inactive, are aware of being out of shape, and feel little motivation to alter this status as their self-identity is more bound to social connections than any motivation to be active. The inactive, extrinsic group might be easier to reach because they experience some level of engagement or interest in activity regardless of the factors that motivate them.

In the current study, extrinsic participants had more commonalities across activity categories, than their intrinsic counterparts. Both extrinsic groups (active and inactive) saw themselves as generally healthy and active. They also associated healthy as being an acceptable weight and were very aware of social comparison, acceptance, and judgment. However, the interpretations of these values by (extrinsic) active versus inactive groups were different. For example, active extrinsic participants conveyed the idea of being active to improve appearance and attractiveness, with an air of exclusivity surrounding activity and specifically the gym environment (judgment of others exercising, “no tolerance for people”). The idea of exclusivity could be due to active versus inactive status, or it could also be associated with a long-standing body of literature regarding social class, social capital, and exclusion in sport and activity (Collins, 2004).

The inactive extrinsic participants had a similar set of values but were very aware of their “fit” within the gym environment (aware of being judged, “so many people staring at you”), as if they knew they were on the verge of being excluded, enough so that they seemed uncomfortable with the environment (“golly I’m bigger, so I was uncomfortable for a little while until I dropped 20 pounds”). These differences in perceptions of exclusive versus excluded support the findings that exclusion may impair self-regulation and thereby health behavior without the intervention of

positive factors (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Although social exclusion seemingly did not prevent active intrinsic participants from using the gym facility, when they talked about being active they were more likely to refer to being active with friends in alternate environments and in more inclusive contexts.

Self-identity of physical activity has both positive and negative attributes. Self-identity that includes beliefs about being an active or athletic person may increase participation in physical activity (K. Miller, Ogletree, & Welshimer, 2002), however, as Phoenix, Faulkner, and Sparkes (2005) asserted, it can also serve as an Achilles heel. Persons with strong athletic self-identities and perceptions of activity being exclusive may be less able to perceive their future self (older self) being able to maintain activity levels. Phoenix et al. (2005) suggested that this is particularly true for persons without strong intergenerational role models for activity. For extrinsic oriented persons, who are predominantly active for reasons related to improved appearance, this key may explain low levels of activity maintenance over time, even brief periods of time. This suggestion is congruent with findings from the present study where extrinsic, inactive participants desired “surgery results in a week’s time.” Motivation and subsequent maintenance of activity may be an area where participants in the active intrinsic group have an advantage. The active, intrinsic participants perceived activity to be about balance, health, enjoyment, and lifestyle, which is arguably a more conducive approach to activity across the lifespan.

Persons with materialistic self-identities did have higher ratings of self-efficacy. Self-identity of physical activity and self-efficacy of physical activity have both been shown to be associated with vigorous activity participation (K. Miller et al., 2002). Neumark-Sztainer, Story, Hannan, Tharp, and Rex (2003) found in their intervention study targeting adolescent females

that the three strongest associations with physical activity were time constraints (barrier), social support for physical activity, and self-perceptions (self-efficacy and self-worth). Those findings are in support of similar intervention findings that suggest that community participation approaches that increase self-efficacy and social support (specifically partner support) can increase physical activity of mothers with young children (Y. D. Miller, Trost, & Brown, 2002). Furthermore, an additional study indicated that self-efficacy predicted postintervention exercise intensity (Dawson & Brawley, 2000). The present study was cross-sectional in nature and can not address the predictive power of self-efficacy for future exercise, but based on what is known regarding the declination of activity as age increases, one wonders to what extent participation in activity by aesthetically motivated extrinsic participants is responsible for some of that decrease. That is to question, is the decrease in activity rates related to a change in values or the realization of the extrinsic population (who are more likely to be active in college) that surgery results are not achieved as readily as one ages?

Self-identity carries with it not only the potential for individuated perceptions regarding ethnic identity but also symbolic meanings associated with items or behaviors (Wetter et al., 2001). The findings in chapter 4 and discussed here are supportive of the conceptualization of the constructs as diagramed in Figure 2. The two bottom circles of the diagram show symbolic representations and norms, with their overlap representing aspirations. The conceptualization was borne out through the qualitative findings where active extrinsic participant self-identities were connected to the symbolism of materialistic locations (highly visible, exclusive). Quantitatively, materialistic self-identity was positively associated with being more materialistic, self-standard for fitness, social support, and physical activity self-efficacy.

Research Question 4: To what extent, if at all, are materialistic values and physical activity related to social norms?

Research Question 4 was investigated through both quantitative and qualitative means. Social norms were significantly associated with physical activity, but not relative intrinsic orientation in quantitative analysis. Although injunctive and descriptive norms were individually associated with physical activity, collinearity was present when entered together in a multiple linear regression. Qualitatively, many similar themes emerged from the previous question with an opportunity to view them through the lens of a group's norm rather than an individual's perception. Within the literature, a myriad of differences exists on the influence of norms on physical activity, some of which are discussed in chapter 2. Some suggest that the strength of normative influence on intentions for activity is significantly influenced by a fear of negative appraisal (or how much one cares what other people think of them; Latimer & Martin Ginis, 2005). It was possible that this attribute emerged as the desire for conformity within the groups with extrinsic orientation.

In terms of normative environmental contexts, locations were often associated with types of people and behaviors. This was particularly easy to depict for the extrinsically oriented participants. Although intrinsic-oriented participants were reticent to label people and places, the extrinsically oriented group had clear ideas of locations and requisite behaviors or stereotypes. These locations were comprised of many different types of activities common to college environments. Of interest here are the perspectives regarding activity. The student recreation center was named as where people go to work out, and to look good, whereas the Quad was mainly for people that are "athletic people or people who are trying to lose weight or be more physically fit."

Awareness of normative gender roles within activity locations was present among all groups, with the active intrinsic group appearing to be the most resilient to that, as well as other barriers. Traditionally, gym spaces have been considered inherently masculine locations (Leeds, Craig, & Liberti, 2007). In the present study, spaces perceived as particularly male were the weight area and the court areas of the gymnasium. Basketball spaces were associated with higher numbers of African American males. Spaces or locations seen as predominantly female were the upstairs cardio areas, hallway abdominal mats, and group exercise rooms.

As in the previous question, extrinsically oriented participants placed a high priority on weight loss and appearance as the major motivators for physical activity among their peers, fairly common characteristic of activity norms in American culture (Lindwall & Martin Ginis, 2006), and specifically among college age females (Kowalski, Crocker, & Kowalski, 2001). The topics of diet, weight loss, and activity are well chronicled in the literature (Curioni & Lourenco, 2005; French & Jefferey, 1994; Volek, VanHeest, & Forsythe, 2005) as are the anecdotal and research supported ideas regarding weight stigma and the negative impact bad experiences can have on exercise participation and adherence (Chambliss, Finley, & Blair, 2004; Vartanian & Shaprow, 2008), and that body shape related motives among women are associated with decreasing activity in adulthood (Segar, Spruijt-Metz, & Hoeksema, 2006). In the present study, attractive appearance and weight loss were motivational factors for both activity levels within extrinsic orientation, but they were not an emphases point for the intrinsic active group, and they were barriers to activity for intrinsic inactive participants. It appears that an over reliance on weight loss as a “one size fits all” attractor for activity excludes persons who feel the only reason people work out is for vanity and are uncomfortable with weight as a constant presence in social

conversations. Inactive participants of both orientations commented that many people say “you are skinny, you don’t need to work out.”

Extrinsic groups of both activity levels also placed importance on the idea of conformity to norms and social image. Extrinsic groups had a much more narrow view of what it was to be healthy and what people who are active looked like. Thereby there were unspoken criteria in which people either fit (conformed) or did not fit (subject to peer judgment). Where this narrow definition comes from is attributed to many sources, one of which is the media. One study suggested that although young girls know that media images or expectations are unrealistic, those expectations are still salient because the girl believes it matters to others (Milkie, 1999). This was reflected once again by the unrealistic “surgical expectations” of the inactive extrinsic groups who are so disenchanted by their own inability to reach that unrealistic goal they choose of not being active (weight loss was the primary motivation and goal of activity). Conversely, participants with intrinsic orientations felt that health and activity were more individually based and that norms for health were general guidelines and inclusive of other concepts like healthy relationships and happiness. There was one situational exception to this finding, however. In the cases where the participants were significantly overweight or obese they seemed to indicate more discomfort with their weight and expressed more of a focus on guilt about inactivity than did their other intrinsic peers. This could be a reflection of the dominant social norms regarding weight or the influence of personal experiences of stigma.

Social modeling was interpreted as guilt induction by inactive extrinsic participants. Guilt was another important activity motivation factor for participants with extrinsic orientation. Guilt increased when a person representing them was particularly thin or attractive. There is some evidence that activity social environment preference (exercising alone, with friends, or no

preference) may moderate social modeling by friends and activity levels in older women (Wilson & Spink, 2009). The influence of friends modeling was only related to increased activity for those who preferred to be active with others (Wilson & Spink, 2009). Extrinsic groups did not necessarily associate seeing others being active with enjoyment, whereas participants with intrinsic orientation made the assertion that activity was enjoyable for those that participate, based on the choice to repeat a given behavior. Although the quantitative findings regarding this research question are not as clear, the qualitative findings suggest that there are group normative differences by materialistic orientation and activity level.

Research Question 5: Are materialistic values a barrier and/or a facilitator of physical activity?

Research Question 5 was addressed through both quantitative analysis as well as qualitative methods. Barriers were categorized as external, internal, and personal as per D. M. Williams et al. (2005). External barriers are such things as lack of access to facilities, transportation, or money that might keep a person from being active. Personal barriers include lack of time or social support, injury or sickness, and fear of injury, which might keep a person from being active. Lastly, internal barriers were described as lack of motivation or desire, or feeling self-conscious, which might keep a person from being physically active.

There is a preponderance of information in the literature regarding barriers and facilitators to activity. That association was reflected in the findings with internal and personal barriers in the present study: Persons reporting fewer barriers were more active. Although the causation of that relationship can not be drawn, one advantage of this study was that all students shared a common environment; however, their perceptions of it differed. Within the literature there is not a clear consensus regarding whether perceived or actual environmental barriers have

more explanatory ability (Brownson et al., 2004). Evidence suggests that those facing fewer barriers to activity are more likely to engage in recommended levels of physical activity when compared to persons that face a greater number of barriers (Zlot, Librett, Buchner, & Schmid, 2006). In the present study, quantitative findings indicate internal barriers as the only type of barrier significantly related to physical activity.

Pertinent barriers to physical activity in this study include being too tired (Brownson et al., 2001), time constraints (Neumark-Sztainer et al., 2003; Zlot et al., 2006), bad or cold weather (Belanger, Gray-Donald, O'Loughlin, Paridis, & Hanley, 2009; Salmon et al., 2003), negative experiences, peer pressure, identity conflict, male dominance, competitive, social physique anxiety, low confidence or competence in skill, and crossing gender roles (appearing too masculine; Allender, Cowburn, & Foster, 2006), age (younger students exercised more than older students; Reed & Phillips, 2005). An additional barrier mentioned by several groups was the presence of alternate modes of transportation (busses). Similar to the proximal presence of elevators in an office building (Nicoll & Zimring, 2009), the presence of riding the bus as an option was a barrier to active transportation particularly for the inactive population.

Facilitators and motivators of physical activity that were relevant to this study include the following: good weather (Merrill, Shields, White, & Druce, 2005), body shape and weight management, social networks, social support, achievement, skill development, and enjoyment (Allender et al., 2006). The most notable difference in regard to this question was that the active intrinsic group was most able to list many facilitators to activity claiming excellent access to opportunities for activity (“Tuscaloosa is good about having parks,” “campus is becoming a lot more active”). Active participants from both materialistic groups were aware of barriers and

admitted being influenced by them on occasion, but had found positive ways of negotiating those barriers to maintain activity regardless of how or why they were motivated to be active.

### Implications

The current study supports the continued commitment to understanding the role of materialism in physical activity. Implications for better practices and future research include the continued examination of life satisfaction as it relates to physical activity and materialism, as well as an expanded understanding of the role of the physical environment, inclusive of contexts and identities, in creating active communities. Also, there is an expressed need to improve quantitative instruments for measuring norms and barriers or facilitators of physical activity. Further, the study reminds practitioners and researchers alike of the importance of a balanced approach to health (rather than an overemphasis on weight loss) and health messaging, and provides some modest suggestions for consideration in message tailoring. These items are discussed in more detail here.

Materialism has a well-established negative association with life satisfaction and well-being (Kasser & Ryan, 1993; Kasser & Sheldon, 2000; Srivastava et al., 2001). The literature indicates that there is supportive evidence for a positive association between physical activity and well-being (McAuley et al., 2000). The findings of the present study present a complex relationship, worthy of further investigation. Results provided in chapter 4 demonstrate that persons with less materialistic orientations (intrinsic) were more satisfied with life and less sedentary. However, life satisfaction was not correlated directly with physical activity. This could be explained by the relationship of physical activity and materialism: More materialistic persons were more active but also less satisfied with life, thereby ameliorating the expression of life satisfaction given by active intrinsic persons. This may indirectly suggest that one of the

most satisfied groups are active with intrinsic orientations. Again, these relationships deserve further examination to clarify their relationships; however, one potential implication is that active, intrinsic-oriented persons may be the best peer advocates for physical activity. Active, intrinsic persons value the health benefits of activity, prefer inclusive activities and contexts, and are less concerned with social conformity.

A substantive portion of this study was aimed at better understanding the dynamic interaction of the built environment (location), the social environment (norms and identities), and experience of activity as they related to materialism and physical activity. As previously asserted, there is an inherent overlap of the topics under examination. For example, location can be viewed as the literal built environment, the value placed on that location, the normative behavior expected in or associated with that location, and the affective experience of that location. Therein lays a major challenge of this research.

The preponderance of literature regarding physical activity and the built environment has sought to objectively measure tangible characteristics of a given space. However, this approach is lacking in the integration of how built characteristics shape individual and collective embodied experiences (not just subsequent behavior), and whether the sum experience of the built environment serves as a facilitator or barrier of physical activity. The difficulty of integrating these oft delineated areas becomes most apparent when discussing Research Question 2 (Do materialistic values influence the selection of physical activity location?) and Research Question 5 (Are materialistic values a barrier and/or facilitator of physical activity?). The discussion of location selection is inherently messy if trying to incorporate concepts beyond simple objective measurement. In the results of Research Question 5, external barriers fail to reach statistical significance during quantitative analysis (ANCOVA). However, qualitative findings indicate that

the physical environment either establishes, co-exists with, or reproduces a social environment that some groups find to be problematic.

Integrated approaches to the built environment have historically been embraced more by fields focused on planning and design but can be found in recent physical activity related literature (Frank, Saelens, Powell, & Chapman, 2007; Leyden, 2003). Sallis et al. (2006) included a call for research such as this, which can inform better design and subsequently assist in the creation of more active communities. Commensurately, it is the author's belief that the environment, values, norms and experience are dynamic and interconnected in a way that makes initial individuation and subsequent integration of each construct both impossible and yet necessary to thoroughly understand them. This dynamic relationship is conceptualized, as previously stated, in Figure 2. It is through this type of work that the call of Sallis et al. can be engaged and met. In order to do this, there must be a continued effort to understand the dynamic interaction of the topics at hand through continuing and related lines of research.

Similarly, campus environments need to continue in their commitment to develop activity friendly and endorsing environments. This happens through utilization of research such as what is presented here, as well as administrative oversight consciously focusing on creating walkable environments and engaging contexts through planning. It is important that planners reconsider for whom they are developing these spaces, as activity spaces are often planned for current users rather than potential users. Simultaneously, efforts to increase the social norm of active transportation and identity for both students and faculty alike would be beneficial. Remembering, that perceptions of distances may vary according to activity levels, some attempt to alter perceptions of distances as prohibitive for walking will need to be undertaken.

Health professionals working with college students should, similarly, consider the role of activity level and materialistic values orientation as they relate to social and self-identity of activity on campus. Between-group differences brought to light here should help to continue the elaboration on potential location contexts, symbolism of locations and activity type, and the presence of varying ethnic identities that may be present among their student populations. Further consideration should be given to the creation and publicity of alternate activity spaces that are programmed but occur outside of traditional fitness center contexts.

The present study serves as a reminder for health professionals that over reliance on the weight loss issue as a primary attractor for activity spaces may be doing more harm than good. Although a weight loss driven approach may attract some participants, it may also disenfranchise those who have a different body ideal, see activity as irrelevant because they are thin, or are conscientious of their inadequacy and desire to avoid judgment. The promotion of activity for immediate health-related outcomes that are not weight and image driven (stress reduction, enjoyment), the provision of alternate methods and locations for lifestyle driven activity, and possibly intergenerational images of successful activity maintenance may serve to encourage a college population to increase activity and consider activity as a maintainable portion of their lifestyle.

Finally, interventions aimed at increasing physical activity rates among college students should consider materialistic orientation for message tailoring. As mentioned previously, some subgroups, for example intrinsic inactive students, may be the most difficult groups to reach with physical activity interventions. The methods of reaching a group that is more socially oriented, uncomfortable with weight loss as a focus, generally don't care for fitness environments, and are

less interested in activity would vary substantially from those who enjoy activity in a competitive or highly visible environment.

### Limitations

There were a number of limitations that must be acknowledged regarding this study. First, the present study represents an initial foray into the possibility of an entirely new area, and as such, there was no established set of thoughts on how the variables should be considered. As such, further investigation is warranted to more completely understand the complex nature of the relationships between the variables at hand.

The second limitation is that the study relies on self-report data for both materialism as well as physical activity. Self-report data has well-documented limitations of recall bias and over reporting of activity (Wilbur et al., 2001). However, findings have not been so critical of the methodology (S. Adams et al., 2005) to suggest its removal from use as a measurement technique for free living physical activity.

The third limitation of the study is that convenience sampling was utilized, and the sample had a stronger representation of the female population; therefore the results lack generalizability to the greater U.S. college population. Although random sampling is a far preferable technique, the use of convenience sampling is not uncommon and especially for projects that are limited in budget or unfunded. A simple database search for physical activities use of convenience sampling yields a long list of recent studies that have used this technique, including many sighted previously in this paper (including but not limited to Umstatted et al., 2006 and Umstatted et al., 2008).

The fourth limitation is that theoretical limitations exist as the IBM has not yet been applied to physical activity behaviors beyond this study. However, as discussed in chapter 2, the

TPB has been used and continues to be used in similar investigations of physical activity (King et al., 2002). This limitation will be addressed by the eventual use of the data collected in the present study to add to the body of literature.

The fifth limitation refers to the process of MET expenditure in combination with duration of activity that creates MET minutes, which are the basis for the guidelines for physical activity (Haskell et al., 2007). This approach is not without concerns, however. Researchers acknowledge the possibility that MET values may overestimate the energy expenditure of the participant (Byrne et al., 2005). The original value of one MET was ascertained from the resting oxygen consumption ( $VO_2$  of 3.5ml per kg per minute) of a 40-year-old male weighing 70 kg. Research has shown support for questioning the exacting accuracy of MET values based on variables such as gender, age, and body composition (Byrne et al., 2005). Although the use of MET values is not without fault, it is still a dominant method used in self-report physical activity research.

The sixth limitation of the present study is in regard to the use of Total MET minutes of activity. The Total MET minute score was outside normal ranges for both skewness (4.93) and kurtosis (39.16) and was therefore transformed by use of the square root as seen in Wilcox, Dowda, et al. (2006). Although there are additional steps for normalization of physical activity data that can be undertaken, the present study took a conservative approach of using the least number of steps possible in an attempt to contain the potential impacts of limitation.

Finally, there are some indications for needed revision of quantitative instruments. The measurements used in the establishment of normative beliefs were unable to distinguish injunctive and descriptive norms or were not discrete enough for the participant to be able to differentiate between the two items (King et al., 2002). Although this finding is not without

acknowledgment in the literature, it is regrettable that a more sensitive measurement was not available to allow for more clear quantitative results. Similarly, the quantitative measurement of barriers to activity, and particularly external barriers, is not inclusive of a more integrated view of environmental context as previously discussed. Although both of these items can be considered limitations, they also provide opportunity for further work to improve the functionality of the instruments.

### Future Research

There are many opportunities for future research regarding this line of inquiry. First, further examination is warranted regarding specific materialism subscales and their interaction with physical activity. A more clear understanding is needed regarding subscales of materialism that might be key components for the college aged and college student populations. The constructs included in the analysis for Research Questions 2 and 3 need further analysis to clarify the relationships and the potential for mediation or moderation.

Additionally, self-efficacy is a construct needing further attention in future studies. In the present study, self-efficacy was highly correlated with self-standard for fitness and yet failed to explain half as much of the variance. The relationship between self-standard of fitness and self-efficacy, and the subsequent association to physical activity, warrants further exploration. Although self-efficacy's relationship to physical activity is well-documented, only a small amount of information ties it to materialism. To date, these two bodies of self-efficacy literature have not been connected, and an integration of this knowledge would be helpful for programming and intervention planning to increase physical activity. Also, a future transition to longitudinal research will provide a better gauge of how the relationship between materialistic values and activity change postcollege and across the lifespan.

As discussed previously, little integrative research is available regarding the contextual environments in which materialistic influences on physical activity take place, as well as how those contextual differences may form facilitators or barriers for different subpopulations. Anecdotally, the discussion of discomfort in traditional gym environments is often discussed among physical activity professionals, and yet this environment has evaded an integrated approach to examination and description. Related to the perception of physical environments are differences in the perception of distance that can be found between groups of varying activity levels. Again, this represents an area where little research is available. Although there are descriptions of distance parameters as they relate to increasing active transport, there is lack of clarity about how distance perceptions differ based on different individual or group characteristics. Both of these issues are especially pertinent in campus environments that are providing both physical locations for activity as well as attempting to increase active self-transportation and perceptions of walkability.

Theoretically, a more complete depiction of how the IBM performs in the physical activity setting is needed. Although similar constructs continue to appear in the literature through the TPB, again this is an area that calls for the aggregation of constructs commonly utilized in physical activity rather than segmenting of the literature through the use of older forms of the models. In terms of constructs for normative beliefs, the continuation of research is needed regarding the role of social and self-identity in physical activity as it relates simultaneously to materialism and physical activity. This would include the development of more sensitive and discreet measures for normative constructs (injunctive and descriptive).

Table 14, given following, provides a summary of the present study's findings. The table includes implications of those findings as well as areas that need further investigation.

Table 14

*Summary of Findings and Needs for Further Investigation*

RQ	M	Summary of Findings	Implications	Further Investigation
1. Do materialistic values impact participation in physical activity?	QT	Physical activity is associated with more materialistic values.	Materialism is related to physical activity, precise relationship is not clear.	Explore relationship of variables for mediation/moderation.
2. Do materialistic values influence the selection of physical activity location?	QL	Location type and context varied by materialism grouping. Perception of distance and transportation preference varied by activity level.	Location type and context influence experience of location, therefore need measurement.	Integration and further investigation of these findings as barriers/facilitators of physical activity.
3. Do materialistic values influence the individual's experience of physical activity?	QT	Self-standard for fitness, self-standard for materialism, and materialistic orientation were strongest predictors of physical activity.	Influence of materialism warrants clarification for translation to best practices.	Explore self-standard of fitness and self-efficacy relationship to each other and physical activity.
	QL	Extrinsic focus on competition, comparison, guilt, appearance, and exclusion. Intrinsic focus on inclusion, acceptance, and balance.	Confluence of location-experience suggest new approach to programming.	Explore further to inform programming, facility design, and message tailoring.
4. To what extent, if at all, are materialistic values and physical activity related to social norms?	QT	Norms are related to activity, however the instrument is not sensitive enough to differentiate between injunctive and descriptive norms.	Further research is needed to develop instruments.	Improve instruments for measurement of norms in physical activity.
	QL	Extrinsic quickly able to associate norms of locations, emphasize conformity, and appearance. Intrinsic reticent to assess norms of locations, discomfort with conformity, and assumption of enjoyment for repeated behaviors.	Message tailoring by materialistic orientation and activity level may be a more effective way to reach student populations.	Expand findings to inform knowledge of norms in physical activity literature. Assess extent to which groups are susceptible to norm altering messages.

*Table 14 Continued*

RQ	M	Summary of Findings	Implications	Further Investigation
5. Are materialistic values a barrier and/or facilitator of physical activity?	QT	Internal (lack of motivation, self-consciousness) and personal (lack of time, social support or sickness) were significant predictors of physical activity. External barriers (money, transportation) were not significant.	Further research is needed to clarify the definitions of and contexts experienced as barriers.	Improve measurement of barriers to include integration of location context and experience.
	QL	Barriers/ facilitators were similar across groups. Active participants more readily saw facilitators to activity than non-active group.	Messages may be able to heighten resource awareness/ decrease perceived barriers.	Explore barriers and perceptions of barriers susceptibility to alteration.

*Note.* M = methodology; QT = quantitative, QL = qualitative.

### Conclusions

The present study represents the first foray into understanding the nature of materialism’s influence on physical activity. The investigation was theoretically grounded and has much potential to yield insight for future research and, eventually, policy and intervention planning aimed at increasing physical activity. As expected with an initial exploratory study, some questions were answered, whereas others indicated the need for further exploration. Although there are questions to be further investigated, the present study was able to establish a basic understanding of the relationship between materialism and physical activity among a traditional aged college population. Materialistic values interact with physical activity and represent a complex set of relationships in regard to life satisfaction and well-being. Additionally, materialism was found to influence location selection for physical activity, experience of

activity, norms associated with activity, and may be indirectly related to the experience of barriers and facilitators of activity. The findings of this study suggest a line of inquiry that is timely, culturally relevant, and worthy of further investigation.

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APPENDIX A  
IRB APPROVAL

Office for Research  
Institutional Review Board for the  
Protection of Human Subjects

THE UNIVERSITY OF  
**ALABAMA**  
R E S E A R C H

February 13, 2009

Stephanie Baller  
Department of Health Science  
College of Human Environmental Sciences  
The University of Alabama

Re: IRB # 09-OR-005 (Revision) "An Investigation of Value Systems and Physical Activity"

Dear Ms. Baller:

The University of Alabama Institutional Review Board has reviewed the revision to your previously approved expedited protocol. The board has approved the change in your protocol.

Please remember that your approval period expires one year from the date of your original approval, January 8, 2009, not the date of this revision approval.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number.

Good luck with your research.

Sincerely,

Carlynn T. Myles, MSM, CIM  
Director & Research Compliance Officer  
Office for Research Compliance  
The University of Alabama



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