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An Investigation of the Quality and Quantity of Student Motivation in Physical Education

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AN INVESTIGATION OF THE QUALITY AND QUANTITY OF STUDENT
MOTIVATION IN PHYSICAL EDUCATION

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Science

in

The Department of Kinesiology

by
Trey Douglas Willoughby
B.S., Louisiana State University, 2012
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TABLE OF CONTENTS

ABSTRACT.....	iii
INTRODUCTION.....	1
METHODS.....	7
RESULTS.....	12
DISCUSSION.....	20
CONCLUSION.....	26
REFERENCES.....	29
APPENDIX.....	34
A. STUDENT SURVEY.....	34
B. IRB APPROVAL.....	40
VITA.....	41

ABSTRACT

Physical inactivity is a prevalent problem in the United States associated with numerous health risk factors. Over half the population fails to meet prescribed physical activity recommendations, suggesting that individuals become less active as they age. It is important to observe individuals in the Physical Education setting because it is an ideal environment to provide meaningful physical activity, while promoting lifetime physical activity. This research sought to understand motivational behaviors in high school adolescents, attempting to draw links between physical education, student satisfaction, and leisure-time physical activity. Three research questions were present: (1) What relationships do high school students perceive among the motivational climate, basic psychological need satisfaction, and the quality and quantity of motivation? (2) What does quantity of motivation and quality of motivation in PE add to the understanding of student satisfaction in PE? and (3) Is there a trans-contextual relationship between the quality and quantity of motivation in PE and leisure-time physical activity? The study was grounded in self-determination theory and achievement goal theory, while adding a “quantity of motivation” variable, a degree of motivational strength. Two secondary schools were observed, an all-male school and an all-female school, with cross-sectional analysis through questionnaires. Hierarchical multiple linear regression models sought to predict quality and quantity of motivation from perceptions of motivational climate and basic need satisfaction. Also, quality and quantity of motivation, including an interaction term, was used to predict domains of student satisfaction. Initial findings suggested that perceptions of mastery climates, competence and relatedness need support were significant predictors of quantity and quality of motivation. Quality of motivation was a

significant predictor of social, emotional, and fitness satisfaction in PE students, while quantity of motivation significantly predicted emotional and fitness satisfaction. The interaction term suggested that motivation quantity raised emotional satisfaction in students with low to average RAI levels with no variability at high RAI levels. These results suggest the importance of motivational quantity on various forms of satisfaction. Its inclusion in future research may discover more links between PE and motivational behavior, ultimately promoting more physical activity.

INTRODUCTION

Physical inactivity is a modifiable risk factor for various health conditions such as cardiovascular disease, hypertension, obesity, and Type II Diabetes (Roberts & Barnard, 2005; Warburton, Nicol, & Bredin, 2006; World Health Organization, 2002). Public health officials currently advise individuals to accumulate 150 minutes of weekly physical activity (Centers for Disease Control and Prevention, 2007), however it is estimated that approximately half of adults in the United States fail to meet this recommendation (World Health Organization, 2004). This deficit in physical activity is present in all age groups, but epidemiology research suggests that physical activity steadily decreases with age (Caspersen, Pereira, & Curran, 2000; Gordon-Larsen, McMurray, & Popkin, 2000).

The school setting is an ideal environment for impacting public health by promoting youth physical activity, which can influence lifelong health behaviors (Sallis & McKenzie, 1991; Pate et al., 1995). Lim and Wang (2009) report that physical education (PE) can promote students' physical activity. Public health advocates suggest PE classes should provide students with at least 30 minutes of physical activity during school. School-based physical activity has also been linked to a variety of positive outcomes such as school satisfaction, self-esteem, and achievement (Brown & Evans, 2002; Kirkcaldy, Shepherd, & Siefen, 2002; Nelson & Gordon-Larsen, 2006). In Gordon-Larsen et al.'s (2000) cross sectional analysis of high school adolescents, findings demonstrated that PE participation was a predictor of self-reported physical activity. While PE classes may provide an environment for students to engage in meaningful

activity, it can also influence students' attitudes toward physical activity outside of school.

Self-Determination Theory

Self-determination theory (SDT) proposes that individuals have innate psychological needs of autonomy, competence, and relatedness. Satisfaction of these needs determines one's placement along an intrinsic-extrinsic continuum of motivation, known as the perceived locus of causality (Deci & Ryan, 1985; Ryan & Deci, 2000). Ryan and Deci (2000) describe intrinsic motivation as the inherent desire to seek challenging tasks through exploring and learning. Extrinsic motivation is considered motivation that originates from external factors outside of the internal satisfaction and pleasure obtained from participating in a task (Standage, Duda, & Ntoumanis, 2003). Amotivation occurs when individuals possess neither intrinsic nor extrinsic motivation towards a task and demonstrate a general lack of intention to act (Seligman, 1975).

Within SDT, extrinsic motivation is divided into four differing types: external regulation, introjected regulation, identified regulation, and integrated regulation. External regulation involves motivation being regulated by external forces such as rewards and punishments and is the least self-determined form of extrinsic motivation (Ryan & Deci, 2002). Introjected regulation involves regulating the behavior, but only because of external factors like guilt or pride. These behaviors regulate internal ego-based feelings. Deci and Ryan (1995) suggest introjected regulation is associated with contingent self-esteem. Identified regulation is more autonomous and recognizes the action as important or beneficial to the individual to the point that it is considered their own (Ryan & Deci, 2000). Integrated regulation is the most autonomous form of extrinsic

motivation due to the fact that the behavior is fully assimilated into the individual's sense of self, but is still done to complete some outcome (Ryan & Deci, 2000).

The continuum of motivation, starting with the least self-determination, is: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. Movement along this continuum is determined by satisfaction of autonomy, competence, and relatedness. Autonomy refers to behavior originating from the self instead of an external force (Deci & Ryan, 1985). The need of competence is being effective at a task so that one will seek challenge and opportunity to show ability (Ryan & Deci, 2002). Finally, relatedness involves the feelings of connectedness and belonging with peers (Ryan, 1995).

Self-determination theorists posit that fulfillment of these three needs in a given context will promote more intrinsic motivation and self-determined behavior. These three needs provide a basis for categorizing contextual environments as either supporting or thwarting optimal human functioning, including self-determined behavior (Deci & Ryan, 2002). The motivational climate provided by teachers can have strong effects on the level of self-regulated behavior, intrinsic motivation, and autonomous behaviors (Nicholls, 1984; Dweck, 1992). Autonomous behavior is ideal in SDT, and so the perception that teachers facilitate an environment that supports students' basic psychological needs is crucial. Vallerand (1997, 2001) conceptualized a pattern that presents a sequence of social factors → psychological mediators → types of motivation → consequences. This model proposes that behavioral, affective, and cognitive consequences, or responses, are influenced by the individual's motivational state. These motivational states, which consist of Deci and Ryan's (1985) SDT, are products of their perceptions of psychological

mediators of autonomy, competence, and relatedness. Finally, the psychological needs are influenced by social factors, which Vallerand (1997, 2001) described as motivational climates. It is therefore helpful to include achievement goal theory in the present study to test this sequential model.

Achievement Goal Theory

Achievement goal theory (AGT; Nicholls, 1984) examines motivational climates and their effect on achievement related conceptions of ability. Nicholls (1984) describes two conceptions of ability in ATG with task and ego, which correspond to mastery and performance motivational climates respectively. Mastery, or task-involving, motivational climates support effort, learning, student choice, and self-improvement (Standage et al., 2003). Conversely, performance, or ego-involving, climates stress normative comparisons, interpersonal competition, and punishment for mistakes (Standage et al., 2003). Individuals who experience task climates are more likely to adopt a task goal orientation, which places heavy emphasis on self-improvement of skills and increasing competence (Standage & Treasure, 2002). Those individuals who have an ego goal orientation view ability is fixed and emphasize the importance of outperforming others (Standage & Treasure, 2002).

Research concentrating on the links between motivational climates and intrinsic motivation has consistently found positive associations with perceptions of a mastery climate. This relationship is explained by the emphasis on self-referenced competence, student choice, and cooperation, which correspond to competence, autonomy, and relatedness respectively (Cury et al., 1996; Goudas & Biddle, 1994; Papaioannou, 1994). Task climates are characterized by an emphasis on effort, learning, and improvement and

therefore, should enhance intrinsic motivation (Nicholls, 1989). Ryan and Deci (1989) state that both SDT and AGT advocate using feedback to foster intrinsic behaviors. Ego-involved behaviors, however, are recognized as inhibitors to autonomy and lead to lower levels of self-determined behavior (Deci & Ryan, 1995; Nicholls, 1989). While the relationships between motivational climates and self-determined motivation may be common in research, Deci and Ryan (2000) report that both SDT and ATG frameworks provide evidence for discerning an optimal learning environment. Specifically, both theories posit that environments with social comparisons, normative comparisons, and controlling rewards thwart intrinsic motivation. Environments with promotion of task-mastery and choice, however, foster intrinsic motivation. Because the motivational climate in PE classes provide observable means to satisfy psychological needs, AGT and SDT can be integrated in research in an effort to fully understand self-determination precursors and outcomes.

Fortier et al. (2011) provide evidence that motivation can be differentiated in terms of quality and quantity. Quality of motivation refers to one's locus of causality, which corresponds where an individual resides on the continuum of motivation (Markland & Tobin, 2004). Quantity of motivation is the amount of motivation an individual has towards a specific task (Fortier et al., 2011). In simple terms, quality of motivation focuses on the underlying motives for action whereas quantity of motivation focuses on the underlying drive for action. Quantity of motivation corresponds well with Bandura's (1989) Self-Efficacy Theory, which views motivation as a quantifiable measure and posits that individuals with higher levels of motivation will reach more optimal outcomes. Mouratidis, Vansteenkiste, Lens, and Sideridis (2008) state that

satisfaction of the three psychological needs is crucial to explaining both the quality and quantity of motivation facilitate movement along the SDT continuum.

A PE environment presents situations in which students take part in physical activity. AGT can provide a framework for examining motivational climates provided by the instructors through the promotion of task and ego involving climates. A greater understanding of motivational processes can be reached by investigating PE environments through an integrated AGT and SDT lens (Cury et al., 1996; Goudas & Biddle, 1994; Papaioannou, 1994).

The Present Study

Grounded in SDT and AGT, the purpose of this study is to investigate adolescents' motivation toward PE and leisure-time physical activity. Specifically, correlational data is used to address the following research questions:

- How do high school students in PE perceive relationships among the motivational climate, basic psychological need satisfactions, and the quality and quantity of motivation?
- To what extent does “quantity of motivation” and “quality of motivation” in PE add to the understanding of student satisfaction in PE?
- To what extent is there a trans-contextual relationship between the quality and quantity of motivation in PE and leisure-time physical activity?

METHODS

Participants

Participants of the study were 274 students from two private secondary schools in southeastern Louisiana (age range = 14-19 years). Students were enrolled in either an all-male school or an all-female school, with a total of 89 males and 185 females. Students were sampled from approximately five-to-six PE classes at each school.

Measures

Motivational climate. Perception of the motivational climate was measured with the task-involving and ego-involving climate subscales of the Motivational Climate in Physical Education Scale (MCPES; Soini et al., 2014). The task-involving climate subscale consists of five items such as “It is important to keep trying even though you make mistakes”. The ego-involving climate subscale consists of four items with an example such as “It is important for students to show that they are better in PE than others”. Responses were completed on a 5-point Likert scale anchored by 1 (strongly disagree) and 5 (strongly agree).

Basic psychological needs. The participants’ sense of autonomy in PE was measured with three items from previous SDT research (Quested & Duda, 2010; Sheldon, Elliot, Kim, & Kassner, 2001). A sample from this inventory is “In PE I am free to do things my own way”. Items were answered on a 5-point Likert scale ranging from 1 (disagree) to 5 (agree). Participants’ measures of perceived competence was assessed through McAuley, Duncan, and Tammen’s (1989) Intrinsic Motivation Inventory. The IMI is traditionally used for measuring levels of intrinsic motivation in a sporting or exercise context through by examining its function of four dimensions: perceived

competence, interest-enjoyment, pressure-tension, and effort-importance. Therefore, five items from the perceived competence domain were used in the current study such as “I think I am pretty good at PE”. Items were assessed on a 5-point Likert scale anchored with 1 (disagree) and 5 (agree). The participants’ feelings of relatedness were assessed through the Need for Relatedness Scale (Richer & Vallerand, 1998). The scale consists of five items such as “In PE I feel valued”. These items were answered on a 5-point Likert scale anchored at 1 (disagree) and 5 (agree).

Quality of motivation. The participants’ quality of motivation in their PE context was measured using the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2; Markland & Tobin, 2004). This scale was created to account for the lack of amotivation items in the original BREQ. Because the BREQ-2 was created to measure exercise behavior based on Deci and Ryan’s (1985, 1991) theory of extrinsic and intrinsic motivation, it was modified to measure motivational behaviors regarding participation in PE. The scale consists of 19 items with five subscales: intrinsic regulation, identified regulation, introjected regulation, external regulation, and amotivation. Examples items are “I don’t see why I should have to participate in PE” (amotivation), “I participate in PE because other people say I should” (external regulation), “I feel guilty when I don’t participate in PE” (introjected regulation), “I value the benefits of PE” (identified regulation), and “I participate in PE because it’s fun” (intrinsic regulation). Items are answered with a 5-point Likert scale starting with 0 (not true) and ending with 4 (very true). For each student, a relative autonomy index (RAI) will be calculated with the following formula (Markland, 2011): $RAI = \Sigma ([\text{amotivation} * -3] + [\text{external} * -2] +$

[introjected * -1] + [identified * 2] + [intrinsic * 3]). Higher RAI scores equate to higher quality of motivation (Fortier et al., 2011).

Quantity of motivation. The quantity of motivation in PE was measured using a 5-item percentile-graded measure used by Fortier and colleagues (2011) in previous research focusing on quality and quantity of motivation in regards to physical activity counseling. Participants were asked questions such as “During the next (1; 2; 3; 4; 5) weeks, I am confident that I can be fully motivated to participate in PE classes” and answered on a scale of 0% (not confident) to 100% (highly confident). There were 10% increments between scores (e.g., 0%, 10%, 20%, ...100%).

Satisfaction in PE. The participants’ level of satisfaction in PE was measured with a modified version of Cunningham’s (2007) Physical Activity Class Satisfaction Questionnaire (PACSQ). Subscales pertaining to social satisfaction, emotional satisfaction, and health-related fitness satisfaction were used. The scale asks the individual’s level of satisfaction in PE regarding “The chance I had to socialize with others” for social satisfaction, “My overall enjoyment of the class” for emotional satisfaction”, and “The physical workout I got during this class” regarding health-related fitness satisfaction. A 6-point Likert scale was anchored at 1 (not satisfied) and 6 (very satisfied).

Leisure-time physical activity. Leisure-time physical activity was measured via the Godin Leisure-Time Exercise Questionnaire (Godin & Shephard, 1997). This measure is focused on assessing how much of the participants’ leisure time is filled with various degrees of exercise. There were a total of four items. Participants were asked: “During a typical 7-day period, how many times on average do you do the following

kinds of exercise for more than 15 minutes during your free time” followed by strenuous, moderate, and mild exercise. The last item asked: “During a typical 7-day period, in your leisure time, how often do you engage in any regular activity long enough to work up a sweat?” with a checkbox for: Often, Sometimes, and Never/Rarely. Scores were calculated as METS from the following equation: Weekly leisure activity score = (9 x Strenuous) + (5 x Moderate) + (3 x Light).

Data Collection

Prior to data collection, the researcher obtained permission to conduct the study from the Institutional Review Board. Next, school principals and PE teachers from each school were contacted in order to seek permission to collect data at the schools. Once permission was granted by the principals and PE teachers, arrangements were made to visit PE classes. The first visit to classes consisted of explaining the purpose of the study to students and handing out parent permission slips. The researcher then revisited each PE class one-to-two weeks later to collect parent permission slips. At this time, the purpose of the study was explained again to students and student assent forms were obtained. The researcher distributed the questionnaire to the class and emphasized that they should answer honestly because there were no right or wrong answers. The students were encouraged to ask questions if they did not understand an item.

Data Analysis

Quantitative data analysis. The first step of quantitative data analysis was to examine missing data at the item level and make a determination about the procedures to replace missing data (Little, 2013). Next, frequency of item responses were investigated to ensure that all data had been entered in accordance to its scale. Internal consistency

estimates for each variable was tested (Cronbach, 1951). A series of descriptive statistic strategies were implemented including calculating means and standard deviations for each variable. Bivariate correlation estimates were also computed.

To address the first research aim, two simultaneous multiple linear regression models were used. Specifically, perceptions of a task climate, ego-involving climate, autonomy need satisfaction, competence need satisfaction, and relatedness need satisfaction were used as independent variables to predict quality of motivation (i.e., Relative Autonomy Index [RAI]; model 1) and quantity of motivation (i.e., model 2).

To address the second research aim, a hierarchical multiple linear regression model was used to predict students' satisfaction toward PE. In the first block of the model, both quality of motivation (i.e., RAI) and quantity of motivation will be added. Both variables were mean-centered. In other words, each student's individual score was subtracted from the grand-mean. This process created a deviation score for each student and rescaled the overall mean to 0 for easier interpretation (Cohen, Cohen, West, & Aiken, 2003). In the second block of the model, an interaction term of quality of motivation and quantity of motivation will be used to determine if low (-1 standard deviation), average (overall mean), and high (+1 standard deviation) quantities of motivation change the relationship between the quality of motivation and student satisfaction (Cohen et al., 2003). The same process was used to examine the third research aim predicting leisure-time physical activity.

RESULTS

Preliminary Data Analysis

Prior to the study, the scale used to measure quantity of motivation was piloted with students (N= 36) enrolled in a physical activity class at a large Southeastern university. Data analysis revealed that there was appropriate variability within the scores and that the measure was reliable and applicable for this study.

Initial screening revealed small amounts of missing data. Approximately 90% of the students provided complete data. There were a total of 28 cases with small amounts of missing data (i.e., 1-5 items missing out of a total of 62 items). Missing data analysis revealed 23 different patterns, suggesting no systematic biases. Therefore, the Expectation-Maximization algorithm was used to replace all missing data (Enders, 2010). Cronbach alpha coefficients were calculated for each all variables in the study to determine internal consistency. Descriptive results are provided in Table 1 and Table 2.

Table 1. Quality of Motivation Bivariate Correlation Matrix, Descriptive Statistics, and Cronbach Alpha Coefficients

Variable	1	2	3	4	5
1 IM	1.00				
2 ID	0.70	1.00			
3 IJ	0.38	0.52	1.00		
4 EX	-0.27	-0.13	0.13	1.00	
5 AM	-0.65	-0.60	-0.29	0.37	1.00
M	3.10	2.56	1.31	0.98	0.73
SD	0.89	0.90	0.97	0.88	0.95
Cronbach α	0.86	0.77	0.65	0.73	0.89
Min-Max	0 - 4.00	0 - 4.00	0 - 4.00	0 - 4.00	0 - 4.00

Note. IM = intrinsic motivation; ID = identified regulation; IJ = introjected Regulation; EX = external regulation; AM = amotivation; M= mean; SD = Standard deviation

Table 2. Bivariate Correlation Matrix, Descriptive Statistics, and Cronbach Alpha Coefficients

Variable	1	2	3	4	5	6	7	8	9	10	11
1 MC											
2 PC	0.13										
3 ANS	0.33	0.08									
4 CNS	0.35	0.44	0.20								
5 RNS	0.42	0.03	0.46	0.26							
6 RAI	0.54	0.26	0.30	0.54	0.47						
7 QM	0.61	0.23	0.30	0.41	0.45	0.64					
8 SS	0.26	0.08	0.27	0.28	0.58	0.40	0.33				
9 ES	0.47	0.14	0.31	0.41	0.65	0.64	0.53	0.73			
10 FS	0.41	-0.02	0.21	0.24	0.47	0.43	0.43	0.43	0.59		
11 LTPA	0.09	0.27	0.01	0.22	0.01	0.07	0.09	0.03	0.01	0.05	
M	4.26	2.76	3.19	3.98	3.82	8.92	71.90	4.83	4.37	4.37	45.05
SD	0.69	1.06	0.93	0.85	1.05	6.85	24.17	1.18	1.16	1.35	31.10
α	0.81	0.82	0.62	0.88	0.94	---	0.96	0.89	0.95	0.96	---
Min- Max	1-5	1-5	1-5	1-5	1-5	-20-20	0-100	1-6	1-6	1-6	0-170

Note. MC = perception of master climate; PC = perception of performance climate; ANS = autonomy need satisfaction; CNS = competence need satisfaction; RNS = relatedness need satisfaction; RAI = relative autonomy index; QM = quantity of motivation; SS = social satisfaction; ES = emotional satisfaction; FS = fitness satisfaction; LTPA = leisure time physical activity; M = mean; SD = standard deviation

Only two variables, autonomy need satisfaction (.62) and introjected regulation (.65), had Cronbach alpha coefficients below .70. In both cases, these variables consisted of a small number of items (i.e., 3).

Descriptive statistics for intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation are provided in Table 1. Scores ranged from a high of 3.10 (SD= .89) for intrinsic motivation to a low of .73 (SD= .95) for amotivation (range = 0 – 4.00). The general trend revealed that students reported a high quality of autonomous motivation. Mean scores for all other variables are reported in Table 2. Students reported stronger perceptions of a mastery climate than performance climate in their PE classes. The scores for autonomy, competence, and relatedness satisfactions were all above the mid-point of their respective five-point scales. The mean score for students' quantity of motivation was 71.90 (SD= 24.14; range = 0 – 100), while the quality of motivation (RAI) mean was 8.92 (SD= 6.85; range = -20 – 20). The mean scores for social, emotional, and fitness satisfaction in PE were all above the mid-points of their scales. The leisure-time PA activity scores average for the sample was 44.30 (SD= 26.32; range = 0 – 170).

Bivariate Correlation Estimates

Prior to calculating the RAI score, bivariate correlation estimates of intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation (see Table 1) were examined to determine if a simplex pattern was present (Otis, Grouzet, & Pelletier, 2005). In other words, the strongest positive correlations occurred between subtypes of motivation directly adjacent on the proposed SDT continuum (e.g., intrinsic motivation – identified regulation, $r = .70$). The magnitude of

correlations decreased or changed directions for subtypes of motivation that were nonadjacent (e.g., intrinsic motivation – external regulation, $r = -.27$). Because the simplex pattern was present, RAI scores were used as an overall measure of the quality of motivation toward PE for these students (Fortier et al., 2011).

A bivariate correlation matrix was calculated with RAI and all other study variables (see Table 2). Findings revealed a couple of noteworthy trends. First, the correlation between RAI and quantity of motivation was $r = .64$, suggesting moderately interrelated but unique constructs. Competence need satisfaction was the only variable to have a significant positive correlation with all study variables. Leisure-time PA was only weakly correlated to perceptions of a performance climate and competence need satisfaction, while all other associations were nonsignificant. These initial findings did not support the trans-contextual link between PE and leisure-time PA. The correlation with the strongest magnitude occurred between social and emotional satisfaction in PE ($r = .73$).

Hierarchical Multiple Linear Regression Models

A total of six hierarchical multiple linear regression models were used to answer the research questions formulated for this study. In the first set of regression analyses, perceptions of the motivational climate (Block 1) and basic psychological needs (Block 2) were used to predict students' quantity of motivation and quality of motivation as measured by RAI. These two models were associated with answering research question one. A total of three hierarchical multiple linear regression models were used to answer research question two. Specifically, quantity and quality of motivation as measured by RAI were mean centered (Block 1) and the quantity x quality product term (Block 2)

were used to predict students' social, emotional, and fitness-related satisfaction in PE. Finally, the same approach was used to investigate research question three. Quantity and quality of motivation (Block 1) and the quantity x quality product term (Block 2) were used to predict students' leisure-time PA.

Research Question One. Findings from the regression models predicting quantity and quality of motivation can be found in Table 3. Perceptions of a mastery climate in PE were a strong predictor of students' quantity ($\beta = .45$) and quality ($\beta = .31$) of motivation. Perceptions of a performance climate did not predict either quantity or quality of motivation. A total of 39% of the variance in students' quantity of motivation and 33% of students' quality of motivation was accounted for by perceptions of the motivational climate. Competence ($\beta = .16$) and relatedness ($\beta = .20$) need satisfactions were positive predictors of students' quantity of motivation, adding an additional 6% percent of explained variance. Competence ($\beta = .33$) and relatedness ($\beta = .23$) need satisfactions were also positive predictors of students' quality of motivation, adding an additional 15% percent of explained variance. Surprisingly, autonomy need satisfaction was not a significant predictor of students' quantity and quality of motivation. A total of 44% and 48% of the variance of students' quantity and quality of motivation were explained in the models.

Research Question Two. All three overall regression models predicting students' social, emotional, and fitness-related satisfaction in PE were significant (see Table 4). In the social satisfaction model, quality of motivation was the only significant predictor

Table 3. Hierarchical Regression Models Predicting Quantity and Quality of Motivation

Predictors	Quantity of Motivation				Quality of Motivation (RAI)			
	β	t-value	R ²	ΔR^2	β	t-value	R ²	ΔR^2
Block 1			.39	.39			.33	.33
MC	.45	8.61**			.31	6.08**		
PC	.08	1.62			.07	1.38		
Block 2			.44	.06			.48	.15
ANS	.02	0.42			.02	0.35		
CNS	.16	2.88**			.33	2.35**		
RNS	.20	3.71**			.23	4.41**		

Note. MC = perceptions of mastery climate; PC = perceptions of performance climate; ANS – autonomy need satisfaction; CNS = competence need satisfaction; RNS = relatedness need satisfaction

($\beta = .31$), accounting for 16% of the variance. The quantity x quality interaction term was not significant. In the emotional satisfaction model, both students' quantity ($\beta = .18$) and quality ($\beta = .45$) of motivation were significant predictors, accounting for 43% of the variance. The quantity x quality interaction term ($\beta = -.15$) was also a significant predictor of students' emotional satisfaction in PE, contributing an additional 3% of the variance. Figure 1 highlights the interaction term at low (-1 SD), average (M), and high (+1 SD) levels of the independent variable and moderator. The visual interpretation suggests that high quantities of motivation reduce the variability of students' emotional satisfaction typically observed across low, average, and high RAI scores (i.e., differences in the quality of motivation). In other words, students with a high quantity of motivation but low quality of motivation reported similar levels of emotional satisfaction in PE as students with both high quantity and high quality. Finally, in the fitness-related satisfaction model, both students' quantity ($\beta = .25$) and quality ($\beta = .26$) of motivation

Table 4. Hierarchical Regression Models Predicting Multidimensional Satisfaction in PE

Predictors	β	Social Satisfaction t-value	R ²	ΔR^2	β	Emotional Satisfaction t-value	R ²	ΔR^2	β	Fitness Satisfaction t-value	R ²	ΔR^2
Block 1			0.16	0.16			0.43	0.43			0.22	0.22
Quant	0.11	1.54			0.18	7.23			0.25	3.51		
Qual (RAI)	0.31	4.10			0.45	2.99			0.26	3.49		
Block 2			0.00	0.00			0.46	0.03			0.00	0.00
Quant x RAI	-0.03	0.43			-0.15	2.84			-0.03	0.42		

Note. Quant = Quantity of motivation; Qual (RAI) = Quality of motivation (relative autonomy index)

were significant predictors, accounting for 22% of the variance. The quantity x quality interaction term was not significant ($\beta = -.03$).

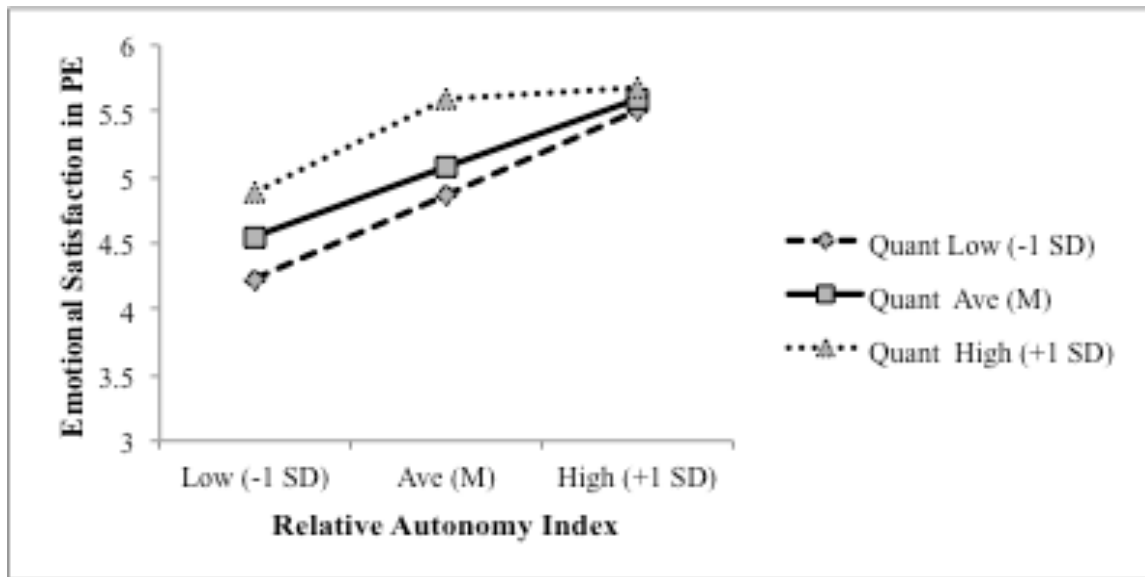


Figure 1. Emotional Satisfaction Interaction

Research Question Three. The overall model predicting students' leisure-time PA was not significant, $F(2, 265) = 1.34$, $p = .35$. Therefore, there appeared to be no trans-contextual links between students' motivation in PE and leisure-time PA.

DISCUSSION

The primary purpose of this study was to investigate the motivation of adolescents towards PE. Specifically, regression analyses were used to predict students' quality of motivation using a RAI and quantity of motivation based on perceptions of the motivational climate and psychological need satisfactions in PE. Additionally, students' quality and quantity of motivation were used to predict multidimensional satisfaction in PE and leisure-time physical activity. The unique contribution of this research was accounting for both the quantity and quality of adolescents' motivation (Fortier et al., 2011). It was hypothesized that the inclusion and combination of a quantity of motivation variable with the recognized quality of motivation variables would further clarify adolescents' satisfaction in PE and leisure-time physical activity behaviors.

The majority of the students reported high levels of autonomous motivation toward PE. The mean scores for introjected regulation, external regulation, and amotivation, often termed controlling motivation (Deci & Ryan, 2000), were below the mid-point of the five-point scale, which suggests that the overall motivational mindset of the students was more autonomous than controlling. The quantity of motivation score averaged approximately 70 (SD= 24) on the 100-point scale. This indicates that the majority of the students' were confident they could be motivated in PE in the upcoming classes.

The information derived from the bivariate correlation matrix largely supports pre-existing research involving SDT and AGT (see Table 2). Perceptions of mastery climates had moderate positive correlations with psychological need satisfactions, quality and quantity of motivation, and satisfaction in the emotional and fitness domain.

Additionally, the quality of motivation measure (RAI) had moderate to positive correlations with all psychological need satisfaction variables as well as emotional, social, and fitness satisfaction. Reflecting on these correlations supports the generally accepted outcome that mastery climates do in fact support need satisfaction and autonomous motivation, which in turn leads to greater levels of satisfaction (Cury et al., 1996, Goudas & Biddle, 1994; Papaioannou, 1994; Standage et al., 2003).

A surprising outcome was the pattern of relationships relating to leisure-time physical activity. Leisure-time physical activity correlations with other study variables, for the most part, were not statistically significant. There was a weak correlation between leisure-time physical activity and perceptions of performance climate and competence need satisfaction. It was concluded from this initial result that trans-contextual relationships between motivation and leisure-time physical activity were likely not present for these students.

Quantity of motivation had moderate positive correlations with perceptions of a mastery climate, autonomy, competence, and relatedness need satisfaction as well as social, emotional, and fitness satisfaction. Of most interest was the correlation between quantity of motivation and quality of motivation ($r = .64$). Specifically, this suggests that quality and quantity of motivation were not the same construct. Fortier et al. (2011) found in their study that quantity and quality motivation had a weak to moderate correlation ($r = .29$) and concluded that the inclusion of motivation quantity was effective, but was nonetheless distinct and conceptually different. The results from this study suggest a stronger relationship between quality and quantity of motivation for these students. It is unclear why a stronger relationship was obtained, but it is possible that is a reflection of

different developmental stages (i.e., adolescents vs. adults) or contexts (i.e., PE vs. physical activity counseling sessions).

In relation to the first research question, perceptions of a mastery climates was a significant predictor of both quality of motivation, as measured through RAI, and quantity of motivation, supporting findings from previous research (Vallerand, 2001; Standage et al., 2003). Quality and quantity of motivation were also shown to be significantly predicted by competence need satisfaction and relatedness need satisfaction. Autonomy need satisfaction was not a predictor of these dependent variables. Self-determination theorists posit that satisfaction of all three needs produces more internal motivation; therefore, the absence of autonomy need satisfaction from this relationship raises concern. Ntoumanis (2001) conducted a study with British adolescents and found similar low mean scores for the students. This was attributed to Britain's national curriculum, which provides few leadership opportunities for students and hypothesized that some PE teachers may not feel comfortable relinquishing control of their class. It is possible that this was the case for the students and teachers of this study. In other words, these teachers may have created highly structured environments that provided students with few choices. It is also possible that students were provided with choices in unstructured (e.g., roll out the ball) or meaningless (e.g., choice between boring content) ways, which consequently reduced feelings of autonomy.

The second research question focused on ability of quantity and quality of motivation, and their interaction, to predict social, emotional, and fitness-related satisfaction in PE. Overall, quality and quantity of motivation were significant predictors of all three satisfaction domains. Social satisfaction was the only domain in which

quantity of motivation was not a significant predictor. This may suggest that social satisfaction does not require a high quantity of motivation for it to exist. That is, students do not have to exert a high level of effort or engage in class activities to obtain social experiences that promote satisfaction. Overall, the results indicate that students with autonomous forms of motivation yield more positive satisfaction outcomes, which is a promising finding that largely supports previous research (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Deci, 2000).

One of the more interesting findings from this model was that of emotional satisfaction, in which all three predictors were significant. The findings, as shown in Figure 1, have low, average, high levels of RAI on the x-axis and level of emotional satisfaction on the y-axis. This illustration shows low, average, and high quantities of motivation across low (-1 SD), average (M), and high (+1 SD) levels of RAI. The result highlights variability in emotional satisfaction based on students' quantity of motivation at low and average RAI. At high RAI, however, there is little to no variability between the quantities of motivation. This finding demonstrates that the quantity of students' motivation was meaningful in predicting emotional satisfaction when quality levels were average or below average. Quantity of motivation was not relevant to emotional satisfaction for students with a high quality of motivation. Fortier et al. (2011) revealed that the interaction between quantity and quality of motivation yielded higher physical activity levels as compared to low to moderate self-determined motivation at the same quantity. Therefore, quantity and quality of motivation appear to have unique interactions in different contexts. This finding may indicate that if an individual enjoys PE without relying on external factors, high emotional satisfaction is independent of motivation

quantity. These findings are significant for the following reasons. First, it supports the idea that regardless of quantity, emotional satisfaction (i.e. enjoyment, fun) increases as one moves towards intrinsic motivation. (Deci & Ryan, 2002) Second, it highlights how quantity of motivation was a significant factor in regards to emotional satisfaction for students with average and below average RAI scores. Therefore, PE teachers who are able to promote a high quantity of motivation are likely able to generate increased levels of emotional satisfaction even when students are not autonomously motivated.

Unfortunately, the model used to predict leisure-time physical activity was not significant, which leads to the conclusion that trans-contextual links between motivation in PE and leisure-time physical activity were not supported. Adolescent years are a time when adult behaviors regarding health, including physical activity, are developed (Aaron, Storti, Robertson, Kriska, & LaPorte, 2002; Baranowski et al. 1997). Therefore, exploring the trans-contextual relationship between motivation in PE and of leisure-time physical activity was warranted. While the goal of PE can be varied, one consistent goal is that quality programs should promote physical, mental, emotional, and social growth so that students can pursue life-long physical activities (Al-Amari & Ziab, 2012; McGlynn, 1993; Fairclough, Stratton, & Baldwin, 2002). Perhaps the students could not draw connections between PE and leisure-time behaviors; that is to say, the students see leisure-time physical activity as unrelated to the content of their PE class. Additionally, students would likely have internalized motivation towards leisure-time physical activity since it is done at their own volition. If the student views PE class from a less internalized position (i.e. extrinsic motivation), then the connection to leisure-time physical activity could become unclear. The lack of support for a trans-contextual relationship suggests

that the overarching goals for these PE classes of promoting leisure-time physical activity were not being met.

CONCLUSION

Practical Implications

The present study echoes past research involving motivational responses in regards to PE and physical activity. The inclusion of motivation quantity was anticipated to provide further insight about adolescents' motivational engagement in a school setting. The findings of mastery climates correlating and predicting autonomous motivation and need satisfactions positively predicting RAI largely supports existing findings. The unique finding of this particular study was that of the interaction term of quantity and quality of motivation significantly predicting emotional satisfaction in PE.

The significant role that the quantity of motivation variable played contributes to understanding motivational behaviors. The finding that motivation quantity can positively influence emotional satisfaction in low to average levels of RAI (i.e. less autonomous motivation) is extremely noteworthy. Ryan and Deci's (2000) conception of motivation as a continuum leaves one subject to motivational behavior based on their locus of causality. The inclusion of quantity of motivation, however, can not necessarily change the quality of motivation, but improve the emotional outcomes associated with it. Additionally, further inclusion of this variable in research may uncover more impacts on other motivational or behavioral outcomes.

The results regarding motivation quantity on emotional satisfaction, as well as its correlations with need satisfaction, certainly support its inclusion in future SDT research. Quantity of motivation from an application standpoint, can certainly make a case for its inclusion in PE classes. As suggested by Fortier and colleagues (2011), focusing on increasing quantity of motivation first and then zoning in on the type of motivation may

be effective. PE teachers should strive to create environments that foster basic psychological needs in hopes to create mastery climates that will produce autonomous motivation. The methods they can take to increase motivation quantity remain more clouded, due to scarcity in research. Fortier et al (2011) found that physical activity counseling involving advising to participate in physical activity and goal setting helped to increase quantity of motivation in their participants. Such inclusion of goal identification, setting, and strategy in PE may increase student self-efficacy towards activity and promote higher levels of motivation quantity.

Limitations

A limitation of this study was that both schools were private and therefore may not be generalizable to public school settings. Additionally, the fact that each school was either all-male or all-female may have affected results. The presence of a co-ed environment may show to be of some significance when predicting motivational climates and outcomes. Regarding the subjects, lack of males ($n = 89$) in comparison to females ($n = 185$) was not ideal for this type of cross-sectional analysis. Ideally, the number of males and females would be approximately the same. It may also be beneficial to future research to include an analysis of male and female differences. Another limitation would be that this was a cross-sectional investigation and the students were only polled once, towards the latter half of the school year. That being said, the fact that the students were questioned during the second half of the school year may have affected the responses to Fortier and colleagues' (2011) measure of quantity of motivation. As one can imagine, an individual's motivational mindset may change when there is an entire school year left as compared to just a few weeks left after the impact of a school year has set in.

Conclusion

Ultimately, this study sought to investigate factors that could ultimately help the obesity epidemic found in the United States by looking at leisure-time physical activity predictors and other motivational relationships. This study can support self-determination theory in that results showed that need satisfaction does in fact contribute to more internalized motivation (Ryan & Deci, 2000, 2002; Deci & Ryan, 1995, 2000). The relationships between motivational climates and motivational outcomes were also supported from the results. This study unfortunately can not confirm any links between motivation and leisure-time physical activity, which was aimed to be a central outcome of focus. Standage, Duda, and Ntoumanis (2003) conclude from their data that students who were more self-determined reported greater intention to partake in leisure-time physical activity. Application of these results can help educators, particularly PE, understand the value of motivational climates on their students' emotional, social, and fitness satisfaction. Satisfying adolescent needs through proper mastery climates can hopefully contribute to higher volume of leisure-time physical activity from an increased satisfaction of physical activity.

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APPENDIX A STUDENT SURVEY

Classroom Teacher Name: _____

Student Age: _____ Gender: _____ Male _____ Female

Grade: _____ 9th _____ 10th
 _____ 11th _____ 12th

Ethnicity: _____ African American _____ Hispanic American
 _____ Caucasian _____ Asian/Pacific Islander
 _____ American Indian _____ Other

Motivational Climate

Circle on the numbers that best represents your feelings about PE	
1. It is important for me to try my best in PE.	(Disagree) 1 2 3 4 5 (Agree)
2. Learning new things makes me want to learn more.	(Disagree) 1 2 3 4 5 (Agree)
3. What's most important is that I progress every year in my own skills.	(Disagree) 1 2 3 4 5 (Agree)
4. It is important for me to try to improve my own skills.	(Disagree) 1 2 3 4 5 (Agree)
5. It is important to keep trying even though I make mistakes.	(Disagree) 1 2 3 4 5 (Agree)
6. It is important for me to show that I am better in PE than others.	(Disagree) 1 2 3 4 5 (Agree)
7. During PE, I compare my performance mainly to that of others.	(Disagree) 1 2 3 4 5 (Agree)
8. It is important for me to succeed better than others.	(Disagree) 1 2 3 4 5 (Agree)
9. During PE, I compete with other students on our performance.	(Disagree) 1 2 3 4 5 (Agree)

Basic Needs

Circle one of the numbers that represent your feelings about physical education (PE).							
1. I think I am pretty good in PE.	(Disagree)	1	2	3	4	5	(Agree)
2. I am satisfied with my performance in PE.	(Disagree)	1	2	3	4	5	(Agree)
3. I feel pretty competent in PE.	(Disagree)	1	2	3	4	5	(Agree)
4. I am skilled in PE.	(Disagree)	1	2	3	4	5	(Agree)
5. I am not very good at PE.	(Disagree)	1	2	3	4	5	(Agree)
6. In PE I feel that my choices are based on my interests and values	(Disagree)	1	2	3	4	5	(Agree)
7. In PE I am free to do things my own way.	(Disagree)	1	2	3	4	5	(Agree)
8. In PE the choices that I make express my true self / who I really am.	(Disagree)	1	2	3	4	5	(Agree)
9. In PE I feel supported.	(Disagree)	1	2	3	4	5	(Agree)
10. In PE I feel listened to.	(Disagree)	1	2	3	4	5	(Agree)
11. In PE I feel understood.	(Disagree)	1	2	3	4	5	(Agree)
12. In PE I feel valued.	(Disagree)	1	2	3	4	5	(Agree)
13. In PE I feel safe.	(Disagree)	1	2	3	4	5	(Agree)

Quality of Motivation

Please indicate to what extent each statement is true for you.					
	Not true	Sometimes true		Very true	
1. I participate in PE because other people say I should.	0	1	2	3	4
2. I feel guilty when I don't participate in PE.	0	1	2	3	4
3. I value the benefits of PE.	0	1	2	3	4
4. I participate in PE because it's fun.	0	1	2	3	4
5. I don't see why I should have to	0	1	2	3	4

participate in PE.					
6. I take part in PE because my friends/family/partner say I should.	0	1	2	3	4
7. I feel ashamed when I miss a PE lesson.	0	1	2	3	4
8. It's important to me to participate in PE regularly.	0	1	2	3	4
9. I can't see why I should bother participating in PE.	0	1	2	3	4
10. I enjoy my PE lessons.	0	1	2	3	4
11. I participate in PE because others will not be pleased with me if I don't.	0	1	2	3	4
12. I don't see the point in PE	0	1	2	3	4
13. I feel like a failure when I haven't done PE in a while.	0	1	2	3	4
14. I think it is important to make the effort to participate in PE regularly.	0	1	2	3	4
15. I find PE pleasurable.	0	1	2	3	4
16. I feel under pressure from my friends/family to participate in PE.	0	1	2	3	4
17. I get restless if I don't participate in PE regularly	0	1	2	3	4
18. I get pleasure and satisfaction from participating in PE.	0	1	2	3	4
19. I think PE is a waste of time.	0	1	2	3	4

Quantity of Motivation

Please remember to answer honestly and accurately. There are no right or wrong answers.

Mark your answer by circling a % of your confidence:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

NOT CONFIDENT MODERATELY CONFIDENT HIGHLY CONFIDENT

1. During the next week, I am confident that I can be fully motivated to participate in PE classes.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

2. During the next **2 weeks**, I am confident that I can be fully motivated to participate in PE classes.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

3. During the next **3 weeks**, I am confident that I can be fully motivated to participate in PE classes.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

4. During the next **4 weeks**, I am confident that I can be fully motivated to participate in PE classes.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

5. During the next **5 weeks**, I am confident that I can be fully motivated to participate in PE classes.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Satisfaction in PE

What is your level of satisfaction in PE for each statement below?							
1. The opportunity to learn new skills.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
2. The improvement in my skills.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
3. My ability to perform better.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
4. My improvement in performance.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
5. My opportunity to practice new skills.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
6. What I learned about sports and activities.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
7. How much I learned about game and sport strategies.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)
8. What I learned about basic physical skills.	(Not Satisfied)	1	2	3	4	5	6 (Very Satisfied)

9. The knowledge about the fundamentals that I learned.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
10. What I learned about basic concepts of sports and games.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
11. The chance I had to meet people.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
12. The interactions that I had with others in class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
13. The opportunity to talk to friends.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
14. My ability to communicate with others in class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
15. The chance I had to socialize with others.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
16. The social atmosphere of class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
17. My overall enjoyment of the class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
18. The amount of fun I had in class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
19. The positive experiences I had in class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
20. The good times I had in class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
21. The improvement of my health due to this class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
22. The physical workout I got during this class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
23. The improvement of fitness I experienced during this class.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
24. The classes contribution to my overall health.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)
25. The progress I made toward a healthier body.	(Not Satisfied) 1 2 3 4 5 6 (Very Satisfied)

Leisure-Time Physical Activity

Godin Leisure-Time Exercise Questionnaire

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

Times Per Week

**a) STRENUOUS EXERCISE
(HEART BEATS RAPIDLY) _____**

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

**b) MODERATE EXERCISE
(NOT EXHAUSTING) _____**

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

**c) MILD EXERCISE
(MINIMAL EFFORT) _____**

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

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

OFTEN

1. ☐

SOMETIMES

2. ☐

NEVER/RARELY

3. ☐

You are finished! Thank you for your participation.

APPENDIX B IRB APPROVAL

ACTION ON EXEMPTION APPROVAL REQUEST



TO: Alex Garn
Kinesiology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: March 3, 2015

RE: IRB# E9216

TITLE: Investigating Multidimensional Motivation in High School Physical Education

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

New Protocol/Modification/Continuation: New Protocol

Review Date: 3/2/2015

Approved X **Disapproved** _____

Approval Date: 3/2/2015 **Approval Expiration Date:** 3/1/2018

Exemption Category/Paragraph: 1; 2a

Signed Consent Waived?: No

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable): _____

Protocol Matches Scope of Work in Grant proposal: (if applicable) _____

By: Dennis Landin, Chairman 

**PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:**

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.

8. SPECIAL NOTE:

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>*

VITA

Trey Douglas Willoughby received his bachelor's degree from the Louisiana State University in 2012. Shortly after graduating, he returned to Louisiana State University under the School of Kinesiology graduate department. Trey will earn his Master of Science in Pedagogy and Psychological Sciences. He plans on entering the Health and Physical Education field upon graduation with eventual hopes to continue research on motivational variables in PE.