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Exploring Social Indicators of Situational Interest in Physical Education and Activity Classes: Integration of Interest and Self-Determination Theories

Joseph Opiri Otundo

Louisiana State University and Agricultural and Mechanical College

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EXPLORING SOCIAL INDICATORS OF SITUATIONAL INTEREST IN
PHYSICAL EDUCATION AND ACTIVITY CLASSES: INTEGRATION OF
INTEREST AND SELF-DETERMINATION THEORIES

A Dissertation

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
Doctor of Philosophy

in

The School of Kinesiology

by
Joseph Opiri Otundo
B. Ed., Kenyatta University, 1995
M. A., Southeastern Louisiana University, 2013
August 2017

This dissertation is dedicated to my dad Jairus (in memory) and my mom Phelesiah who taught me hard-work and value for education. Dad I wished you had lived longer to see this dream that you always wanted me to achieve.

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ABSTRACT

It is clearly documented that physically active lifestyles result in numerous health benefits. Unfortunately, a majority of individuals do not meet recommended physical activity (PA) guidelines. Physical education (PE) courses provide avenues for students to increase PA. Teachers and public health officials identify the importance of student motivation constructs such as interest in promoting PA behaviors and other healthy life habits. The purposes of this dissertation were to advance the measurement of situational interest by investigating social indicators derived from self-determination theory (SDT), and to test a theoretical model that integrates interest theory and SDT. Two quantitative studies were designed to meet this goal.

In the first study, using interest theory and SDT as frameworks, confirmatory factor analysis (CFA) tests were performed to determine if needs support from the SDT perspective were social indicators of situational interest. Relationships between middle school students' situational interest, needs support, engagement, disaffection, and personal interest toward PE were also explored. Findings did not support needs support as social indicators of situational interest; rather findings revealed that needs support was a related but unique factor of the PE learning environment. Situational interest demonstrated discriminant validity with personal interest and engagement by producing moderate positive relationships.

The aim of the second study was to test an integrated model of interest theory and SDT with college students enrolled in PA courses. Again, CFA findings indicated that situational interest and needs support were separate but related factors. Novelty and challenge indicators failed to properly load on the situational interest factor. Findings from structural equation modeling supported the integration of interest theory and SDT. Situational interest is a stronger

predictor of needs satisfaction compared to needs support. Results did not find direct relationship between situational interest and personal interest.

Overall, findings provide useful information about students' situational interest, personal interest, engagement, and disaffection in diverse PE and PA contexts. Also, the results provide evidence for the integration of interest theory and SDT. Finally, results can provide PE and PA teachers and researchers with strategies to structure learning environments that may promote student motivation and engagement, and reduce disaffection.

CHAPTER ONE: INTRODUCTION

Physical activity (PA) provides enormous benefits to human beings, including the development of healthy musculoskeletal tissues, cardiovascular efficiency, neuromuscular awareness, and maintenance of healthy body weight (World Health Organization [WHO], 2016). Despite the importance of PA, many people do not meet the recommended guidelines (Centers for Disease Control and Prevention [CDC], 2016; Pauline, 2013). Based on concerns related to physical inactivity, it is imperative to identify motivational strategies that can be employed to increase PA interest and engagement. PA interest, or a lack of it, may discriminate between individuals that meet PA guidelines and those who do not (Ullrich-French, Cox, & Bumpus, 2013). Interest theory and self-determination theory (SDT) are unique and relevant to this research because they are motivational theories that seek to explain reasons that facilitate or undermine PA engagement (Hidi, 2006; Ryan & Deci, 2000).

Interest is a psychological state that predisposes an individual to continuously engage in an activity (Hidi & Renninger, 2006; Mitchell, 1993). Further, it is a content-specific concept that is related to a topic, task, or activity. According to Hidi (2006), interest results from stimulus-person interaction. Whereas personal interest is deemed stable and dependent on past experiences and knowledge, situational interest is a temporary form of interest that is influenced by environmental factors (Sun, Chen, Ennis, Martin, & Shen, 2008). Scientists posit that the decision to either participate in or disengage from an activity is based on the previous interests and the appealing aspects of the activity (Chen & Zhu, 2005). Evidence shows that interest influences mental functioning, and selection, persistence, and preference of certain activities and tasks over others (Hidi, 2001).

Deci (1992) draws links between interest theory and SDT by articulating how environmental supports for one's autonomy, competence, and relatedness, considered basic needs in SDT, are potential social indicators of situational interest. Despite Deci's clear articulation, social indicators are not currently considered indicators of situational interest in the physical education (PE) context (Chen, Darst, & Pangrazi, 1999). In addition, Krapp (1999) posits that there is connection between personal interest, motivational orientations and needs satisfaction, as envisioned in SDT. While there is evidence supporting association between needs support, needs satisfaction, and motivational orientations, there is limited support for the integration of interest theory in SDT.

SDT is a theory of human motivation and personality that focuses on individuals' innate growth inclinations and needs (Ryan & Deci, 2000). SDT theorists seek to explain motivation factors behind choices that people make (Deci, 1992). Broadly, SDT suggests that there are three forms of motivational orientations: autonomous (internally regulated) motivation; controlled (externally regulated) motivation; and amotivation, which is absence of motivation, (Ryan & Deci, 2000). Also, scientists postulate that motivation operates on a continuum ranging from amotivation through controlled to autonomous motivation. The goal of SDT is for students to attain autonomous motivation (Deci, 1992; Standage, Gillison, Ntoumanis, & Treasure, 2012). Notably, SDT focuses on how social factors facilitate or undermine motivation. Therefore, depending on regulatory factors, a student operates anywhere along the continuum. Conditions that support a student's needs are said to foster the highest form of motivation (autonomous). Further, autonomous motivation is associated with persistence, creativity, and enhanced performance.

Even though there are connections between interest theory and SDT, greater clarity of these relationships needs investigation. The purpose of this dissertation is to advance the measurement of situational interest, and to develop and test an integrated theoretical model of interest theory and SDT. First study specifically explores the indicators of situational interest in PE settings, using confirmatory factor analysis (CFA). In the original situational interest scale (Chen et al., 1999), six items are consistently used as personal-task indicators.

Based on Deci's (1992) theorizing, autonomy support, competence support, and relatedness support are tested as social indicators of situational interest. Examination of indicators of situational interest contribute to the current theoretical and practical understanding of interest. Results from first extend current literature by examining the association between situational interest and needs support, besides investigating the association between situational interest, personal interest, engagement, and disaffection in PE settings. Second study examines the relationship between interest theory and SDT by exploring the structural relationships among the latent variables. Specifically, focuses on association among situational interest, needs support, needs satisfaction, motivational orientations, and personal interest.

Significance of the Inquiry

This research is imperative and needed because it attempts to address the gap that exists in situational interest literature because information on the contribution of social indicators is scanty. Results have implications for teachers, practitioners, and researchers. Secondly, this study provides empirical evidence to the integration of interest with SDT. The findings inform researchers and practitioners who desire to understand the connection between interest theory and SDT, and how the two can be applied to facilitate motivation in a PA setting.

CHAPTER TWO: SITUATIONAL INTEREST IN MIDDLE SCHOOL PHYSICAL EDUCATION: ARE THERE MEASUREMENT ADVANTAGES TO ADDING SOCIAL INDICATORS?

Interest is an important catalyst for behavioral engagement and learning (Linnenbrink-Garcia, Patall, & Messersmith, 2013; Mitchell, 1993). Interest is categorized into personal and situational. Personal interest is the disposition and preference for one activity, and tendency to reengage in that activity (Chen, Darst, & Pangrazi, 2001). Further, it is a stable construct that develops over time, is related to experience and knowledge, and is attached to personal value and feelings (Hidi & Renninger, 2006; Krapp, 2005; Linnenbrink-Garcia et al., 2013). Personal interest develops over time when an individual consistently interacts with specific activities in a specific environment and is interconnected to one's acquisition of knowledge and value systems. Situational interest is a temporary type of interest that is triggered by environmental stimuli and is specific to an activity and social environment (Ainley, Hidi, & Berndorff, 2002; Chen & Darst, 2001). Researchers consider situational interest a powerful educational construct because teachers have more control over it compared to personal interest (Hidi & Renninger, 2006). In other words, effective teaching strategies have the potential to evoke and sustain situational interest. For instance, evidence shows that social environments that encourage group work and psychological needs-support facilitates situational interest (Linnenbrink-Garcia, et al., 2013). In addition, situational interest is instrumental in motivating students, especially those with minimal prior knowledge or experience (Hidi & Harackiewicz, 2000).

Developmental Stages of Interest

Interest development is theorized as a four-phase process: (1) triggered situational interest; (2) maintained situational interest; (3) emerging personal interest; and (4) well-developed personal interest (Hidi & Renninger, 2006). Triggered interest marks the onset of

interest development and is usually, but not exclusively, externally supported. Further, it is caused by “catching” factors (Linnenbrink-Garcia et al., 2013; Mitchell, 1993). Catching factors are instructional tools that are effective in getting students’ interest. For example, group work and meaningfulness are important tools in development of situational interest. Whenever students attach value to any one task, they are likely to stay motivated. Conditions that support autonomy, competence, and relatedness may also trigger situational interest (Deci, 1992).

Long-term engagement, persistence, and self-regulation lead to maintained situational interest (Hidi & Renninger, 2006). Maintained situational interest entails concentrated attention and persistence in a task that extends over an extended period. Maintained situational interest is sustained by ‘holding’ factors such as value and feelings. A learning environment that supports personal involvement and emphasizes the relevance of task to students may help maintain personal interest. A learning environment may include personally involving activities such as group work. Maintained situational interest might either be or fail to be a precursor personal interest. As situational interest continues, there is more exposure to and engagement with an activity, that make interest no longer imposed on the students, but rather it becomes more personal and internally driven.

Emerging personal interest is the third phase of interest developments and it is characterized by stored knowledge, positive feelings, and sustained value. An emerging individual interest is self-generated, even though it might also be externally regulated. Students might require help from teachers and their peers to overcome challenges. Aspects of personal interest include desire to reengage in activities, self-regulation, problem-solving skills, and attachment of value to task (Renninger, 2000). In addition, students at this level begin to choose more difficult tasks, redefine and even surpass task demands.

Well-developed personal interest is the most developed form of interest. At this phase, individual interest is characterized by a relatively enduring predisposition to reengage with a specific task or content area (Hidi & Renninger, 2006). Students promote and control self-regulation, even though to some extent it might require external regulation. In addition, students often persist and overcome challenges.

Situational Interest Indicators

Structurally, situational interest is more multifaceted than personal interest. Scientists have suggested that situational interest in physical education (PE) settings has six dimensions related to person-task interactions; novelty, challenge, instant enjoyment, attention demand, exploration intention, and total interest (Chen, Darst, & Pangrazi, 1999; Sun, Chen, Ennis, Martin, & Shen, 2008). Novelty, the gap between the information which is known and information deficiency, motivates students' desire to learn novel ideas. Individuals want to engage in activities and tasks which bring current ideas or appear to be new. However, teachers are expected to design new concepts in a way that can help students to learn new tasks without getting discouraged (Linnenbrink-Garcia et al., 2013).

Students are motivated by tasks which offer challenges. Challenge is the level of difficulty of the task in relation to an individual's ability. Tasks ought to be designed in a way to offer ideal challenge, which imply being neither too easy nor too hard. Instant enjoyment is another indicator of situational interest. Students desire to engage in tasks that give them pleasure. Exploration intention drives the learner to search and discover new things and facilitates desire to reengage in the task or behavior. Lastly, attention demand is defined as the concentrated cognition and mental energy required in learning an activity.

Despite interest theory having been developed in the early 20th century, application to PE or physical activity (PA) contexts occurred in the late 1990's (Chen et al., 1999). Numerous studies have examined multi-dimensionality of situational interest in PE (Chen & Darst, 2002; Chen et al., 1999; Chen & Zhu, 2005; Sun et al., 2008). For instance, Chen et al. (1999) conducted a four-stage interactive study that examined multidimensional indicators of situational interest in PE classes among middle school students. By the end of the study, it was concluded that indicators of situational interest are novelty, instant enjoyment, challenge, exploration intention, and attention demand, all of which are personal. The factor solution revealed exploration intention and instant enjoyment accounted for the highest total variance (14.59% and 13.66%, respectively). These indicators accounted for 66% of the total variance, suggesting greater amounts of variance may be explained by additional indicators. To determine the relationships among indicators of situational interest in elementary children, Sun et al. (2008) conducted a two-sample, two-stage correlational confirmatory factor-analytical (CFA) research study in PE. The results indicated a good fit between indicators across two samples of elementary students. Results imply that situational interest in elementary and middle school PE students is measured by the same indicators.

Notwithstanding, Deci (1992) suggested that situational interest consists of both personal-task indicators and social indicators. Specifically, social indicators of situational interest were delineated as needs (autonomy, competence, and relatedness) support in self-determination theory ([SDT]; Deci & Ryan, 1985). Deci and Ryan (1985) theorize that feelings of autonomy, competence, and relatedness are nutriments to optimizing potential and well-being. Autonomy is defined as a sense of volition and entails having opportunities to make choices and experiencing non-controlling instructions (Ryan & Deci, 2000; Ryan, Rigby, & Przybylski, 2006).

Competence occurs when an individual experience the opportunity to express capacity and effective interaction with the social environment. Relatedness refers to feeling connected to others, being cared for, caring for others, and having a sense of belonging (Ryan & Deci, 2002).

Standage, Gillison, and Treasure (2007) point to needs support as the foundation for both extrinsic and intrinsic motivation. Research evidence shows that individuals experience more motivation when functioning in an environment that is need-supportive (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011). School environments that support students' needs motivate students to learn novel ideas and skills. For instance, Standage, Duda, and Ntoumanis (2005) found associations between exposures to autonomous environments and adaptive form of motivation in PE settings. Students adjust and move towards autonomous motivation when the social environment supports students' needs. For example, a study with high school girls revealed an association between perceived relatedness with behavioral and emotional engagement in PE (Shen, McCaughtry, Martin, Fahlman, & Garn, 2012). Overall, Shen and colleagues found both the teachers' and students' self-report relatedness predicted behavioral engagement, while relatedness to peers was the strongest predictor of emotional engagement.

Recent research in education has revealed that interest and engagement are closely intertwined (Skinner, Kindermann, & Furrer, 2008). Engagement is an "active, goal-directed, flexible, constructive, persistent, focused, emotionally positive interactions with the social and physical environment" (Skinner et al., 2008, p. 766). On the other hand, disaffection signifies absence of engagement, and it includes occurrence of behaviors and emotions that reflect maladaptive motivational states. While the behavioral component of disaffection is comprised of

passivity and withdrawal from participation in learning activities, the emotional component includes anxiety, frustration, and boredom in the classroom (Skinner & Belmont, 1993).

Investigation of engagement and disaffection constructs ought to be articulated and integrated into motivational theories, specifically, interest theory and SDT, because they play a vital role in explaining the quality of a student's academic commitments and actions towards learning (Skinner, Kindermann, Connell, & Wellborn, 2009). For instance, researchers have shown how engaged students persist in the learning process (Skinner et al., 2009), whereas disaffected students are passive and give up easily when faced with challenges (Skinner & Belmont, 1993). Further, Skinner et al. (2009) suggests that engagement should be viewed in terms of behavior and emotions since the assumption is that individual behaviors and emotions reflect a motivation to master the task and may therefore result in high-quality learning.

To sum up, social indicators may be important dimensions of situational interest (Deci, 1992), but research on social indicators in PE or PA settings remains nonexistent. Previous studies have made significant contributions to existing literature by demonstrating six personal-task indicators of situational interest (Chen et al., 1999; Deci, 1992; Sun et al., 2008; Ullrich-French, Cox, & Bumpus, 2013). However, failure to include social indicators when measuring situational interest in PE is a major limitation. Evidence also points to an association between engagement and situational interest, especially in educational settings (Linnenbrink-Garcia et al., 2013) providing justification to conduct a study on how situational interest relates to student engagement in PE.

Research Questions and Hypotheses

The aim of this study was to examine the potential benefit of adding social indicators to the situational interest construct. Specifically, needs support factors derived from the SDT

framework (i.e., autonomy support, competence support, and relatedness support) were tested as additional indicators of situational interest for middle school students enrolled in PE classes (see Figure 2.1). In other words, nine indicators of situational interest were to be tested in the proposed model.

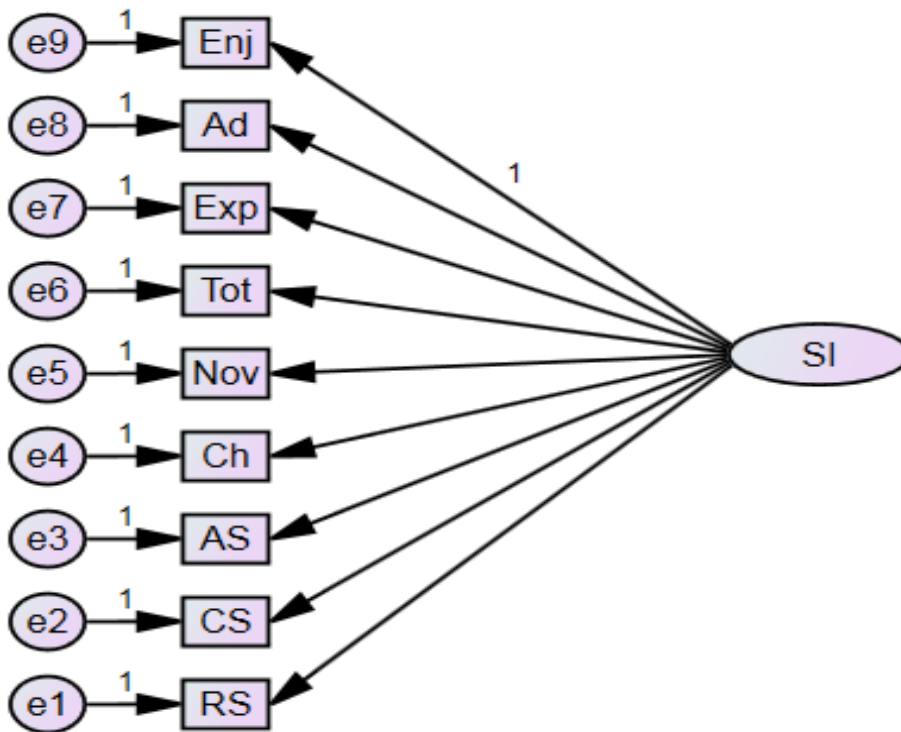


Figure 2.1: Proposed model testing person-task and needs support. Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational Interest; Nov = Novelty; Ch = Challenge; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest.

In addition, the relationships among situational interest, personal interest, engagement and disaffection were tested. The proposed model was to test the relationship between: situational interest and personal interest; situational interest and engagement; situational interest and disaffection; personal interest and engagement; personal interest and disaffection. After doing preliminary confirmatory factor analysis, the proposed model underwent modifications.

Some of the variables were dropped from the final model. The proposed model is presented in (see Figure 2.2).

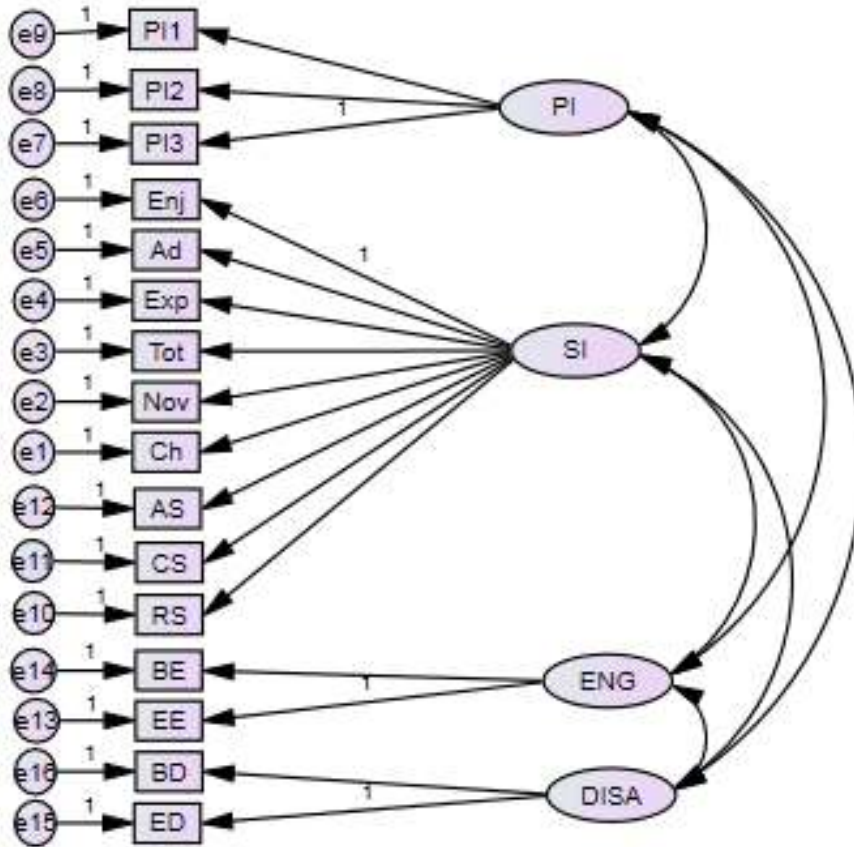


Figure 2.2: Proposed model testing relationships. Notes: DISA = Disaffection; ENG = Engagement; SI = Situational interest; PI = Personal interest.

The following research questions guided this study:

- 1) To what extent does the addition of social indicators derived from the SDT framework (i.e., autonomy support, competence support, and relatedness support) impact model fit and increase common variance in situational interest above and beyond the current six-indicator model?

H₁: The addition of social indicators will produce similar model fit and increase common variance in situational interest above and beyond the current six-indicator model.

2) What are the relationships among situational interest, personal interest, engagement, and disaffection?

H₂: Situational interest will have a positive correlation with personal interest.

H₃: Situational interest will have a positive relationship with engagement and negative relationship with disaffection.

Methods

Participants and Setting

Participants for this study were middle school students (N = 388) enrolled in PE classes from 5 public middle schools in Southeastern region of United States. The participants' mean age was 12.40 (SD = 1.04) and they were predominantly female (64%). Most students reported their ethnicity as African American (46%) and Caucasian (33%). The grade-level distribution of the students was 40% sixth grade, 33% seventh grade, and 27% eighth grade. On average, each class comprised 16 – 23 students. All the classes were taught by certified PE teachers. Eight activities were offered in the PE programs during the term when the survey was administered (check Table 2.1.).

Table 2.1: Activity Frequency

Activity	Participants	Percent
Soccer	61	16
Volley tennis	35	9
Football	30	8
Dance	69	18
Jogging	155	40
Dodgeball	5	1
Basketball	9	2
Combined exercise (running, flexibility, muscle endurance)	24	6
Total	388	100.0

Instrumentation

Instrumentation used for this study comprised a questionnaire to tap demographic details and scales targeting personal interest, situational interest, needs support, engagement and disaffection.

Personal interest. A personal interest scale developed by Trautwein, Ludtke, Marsh, Koller, and Baumert (2006) was used to measure students' personal interest in PE (see Appendix A). The scale was made up of 3-items; the first two items measured affective quality, while the third item taps personal importance. The questionnaire was modified to replace “mathematics” with “PE”. Sample item is, “When I do PE, I sometimes get totally absorbed.” Each item is answered on a 5-point scale ranging from (1) strongly disagree to (5) strongly agree.

Situational interest. Chen et al. (1999) Situational Interest Scale was used to measure situational indicators (see Appendix B). The scale is made up of twenty-four items that include 6-subscales: (a) instant enjoyment, “It is an enjoyable activity to me”; (b) challenge, “It is a complex activity”; (c) novelty, “This activity is new to me”; (d) cognitive demand, “I was focused”; (e) exploration intention, “I like to inquire into details of how to do it”; (f) total situational interest, “This activity is interesting.” The stem of the scale asks students to write down the reference activity and answer each item in relation to his/her experience with the reference activity. There are four items for each subscale. Each item is answered on a 5-point scale ranging from (1) very untrue to (5) very true. The Situational Interest Scale has consistently demonstrated sound psychometric properties in K-12 PE (Chen et al., 1999).

Social indicators. The proposed social indicators of situational interest were measured using needs-support scales from SDT (see Appendix C). Autonomy support was measured using a 6-item scale that has been used in PE settings (Standage, Duda, & Ntoumanis 2006). Each

student was asked to think about the reference activity identified in the Situational Interest Scale when answering each item. A sample item is, “During this activity, the PE teacher provided me with choices and options”. Each item is answered on a 5-point scale ranging from (1) very untrue to (5) very true. Competence support was measured by means of a 4-item scale previously used to examine association between needs support with motivation, and PA outcome among high school students enrolled in PE (Standage, Duda, & Ntoumanis, 2005). Each student was again asked to think about the reference activity identified in the Situational Interest Scale when answering each item. A sample item is, “During this activity, the PE teacher helped me to improve.” Each item is answered on a 5-point scale ranging from (1) very untrue to (5) very true. Relatedness support was measured using a 5-item scale that was used by Standage et al. (2005) to investigate the extent to which needs support is associated with intrinsic motivation. A sample item is: “During this activity, the PE teacher encouraged me to work with others.” Each item was answered on a 5-point scale ranging from (1) very untrue to (5) very true.

Behavioral and emotional engagement and disaffection. Participants’ behavioral and emotional engagement and disaffection in PE was measured using 4 subscales [(Skinner, Furrer, Marchand, & Kindermann, 2008) (see Appendix D)]. Behavioral engagement was assessed using 5-item scale that captured students’ attention, effort, and persistence in PE. A sample item is, “I pay attention in PE class.” Emotional engagement was measured utilizing 5-items that assessed indicators of students’ emotional participation during PE. Sample item is, “When I’m in PE class, I feel good.” Behavioral disaffection was measured using a 5-item scale that tested for lack of effort as well as withdrawal from PE. Sample item is, “When I’m in PE class, I think about other things.” Emotional disaffection was measured with 5-items that captured students’ emotional withdrawal and isolation in PE classes. Sample item is, “When I’m doing work in PE

class, I feel bored.” Each item was measured on a 5-point scale ranging from (1) strongly disagree to (5) strongly agree. In research examining internal dynamics of engagement and disaffection in school, Skinner, Furrer, et al. (2008) found the four sub-scales to have an internal reliability coefficient of $\alpha = .72, .70, .84,$ and $.84$ for behavioral engagement, behavioral disaffection, emotional engagement, and emotional disaffection, respectively.

Procedures

Approval from the IRB was acquired from the university before the research commenced. Permission was also acquired from the school district board, school principals, and PE teachers. Parental consent and child assent forms were obtained from all the participants. The researcher explained the nature of the study to the participants before administering the questionnaires. Data were collected from the gym. The typical class size was 15-23 students. On average, the students took ten minutes to respond to the questionnaires. The researcher was also available to clarify and respond to questions from the participants.

Data Analysis

Prior to statistical analysis, data was screened for missing data, normality assumptions, and outliers. Descriptive statistics was calculated using SPSS 22 for preliminary analysis and included calculation of frequencies and percentages. $H_1, H_2,$ and H_3 were tested using confirmatory factor analysis (CFA) in IBM AMOS version 22. This method is relevant because it not only tests for goodness of fit for the proposed measurement model, but also can examine association between situational interest with other theoretically relevant constructs (personal interest, engagement, and disaffection) using reliable variance. In other words, the use of latent variable analysis in CFA parcels out unique item variance and measurement error from reliable factor variance accounted for in the model (Brown, 2015).

Model fit was evaluated using chi-square goodness-of-fit test (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the root-mean-square error of approximation (RMSEA) (Hooper, Coughlan, & Mullen, 2008). The χ^2 is an index of absolute fit, meaning that the assumption of the test is that the implied variance-covariance matrix represents the sample variance-covariance matrix perfectly (Brown, 2015). Indexes of absolute fit are rarely used alone in applied research because they are highly restrictive, dependent on sample size, and often unrealistic for data collected in natural settings such as schools (Marsh, Hau, & Wen, 2004).

Relative fit indexes including the CFI, TLI, and RMSEA were used because they have demonstrated stable and high performing properties across a variety of simulations (Chen, 2007; Cheung & Rensvold, 2002). Unlike indexes of absolute fit, which test the proposed model to a perfect fitting model, relative fit indexes compare the proposed model to a null model representing the worst fit possible (Little, 2013). CFI values range between 0 and 1 with values closer to 1 representing less misfit within the model. TLI is like the CFI, but differs slightly in that it can exceed values of 1 in certain instances because it is a non-normed test. Both the CFI and TLI are interpreted similarly, with values ≥ 0.90 reflecting an adequate fit and values $\geq .95$ reflecting a good fit of the model (Goubert, Crombez, Van Damme, Vlaeyen, Bijttebier, & Roelofs, 2004).

RMSEA is a fit measure centered on population error of approximation. RMSEA works on the principle that the model cannot hold exactly in the population. The consensus on the cut-off value for RMSEA is .06 (Hooper, Coughlan, & Mullen, 2008), and values up to 0.08 denote realistic errors of approximation in the population (Goubert, et al., 2004). The power of fit indexes in CFA is that the research can examine multiple forms of evidence to decide the fit of

the entire model instead of relying on statistical significance outcomes of individual effects (Kline, 2015).

CFA was also used to test and compare a one-factor model with 6 situational interest indicators and a two-factor model with 8-indicators (challenge was dropped due to low loadings) representing situational interest and needs support. Brown (2015) recommends that the Akaike information criterion (AIC) and Bayesian information criterion (BIC) should be used when comparing CFA models that use a distinct set of indicators. Lower AIC and BIC scores represent a better fitting model.

Results

Descriptive Statistics and Correlation Estimates

Cronbach's coefficient scores, means, and correlations for observable variables are presented in Table 2.2.

Table 2.2: Internal Reliability, Means, and Correlations for Observed Variables

	1	2	3	4	5	6	7	8	9
1. Enj									
2. Ad	.677**								
3. Exp	.676**	.603**							
4. Tot	.844**	.675**	.702**						
5. Nov	.542**	.453**	.572**	.534**					
6. Ch	.214**	.160**	.298**	.177**	.342**				
7. AS	.529**	.514**	.450**	.504**	.432**	.180**			
8. CS	.533**	.583**	.467**	.573**	.374**	.133**	.792**		
9. RS	.484**	.494**	.408**	.462**	.388**	.172**	.827**	.808**	
Mean	3.514	3.680	3.162	3.584	2.863	2.425	3.355	3.792	3.644
SD	.943	.860	.899	1.016	.813	.829	.943	.947	.966
Alpha	.854	.804	.757	.872	.550	.627	.887	.880	.897

Notes: Enj = Instant Enjoyment; Ad = Attention Demand; Exp = Exploration Intention; Tot = Total Situational Interest; Nov = Novelty; Ch = Challenge; AS = Autonomy Support; CS = Competence Support; and RS = Relatedness Support**. Correlation is significant at the 0.01 level (2-tailed).

Novelty and challenge had low internal reliability. All variables, except challenge, have means above the mid-point of the scale. Significant correlations were noted among situational interest and needs support variables. Correlations among observable variables range from moderate to strong relationships, except for challenge which has weak relationship with all other variables.

H₁ Findings

To test hypothesis H₁, a series of confirmatory factor analyses was performed on various models. Model 1 consisted of one situational interest factor with six indicators (enjoyment, attention demand, exploration intention, total, novelty, and challenge). Standardized estimates are presented in Figure 2.3.

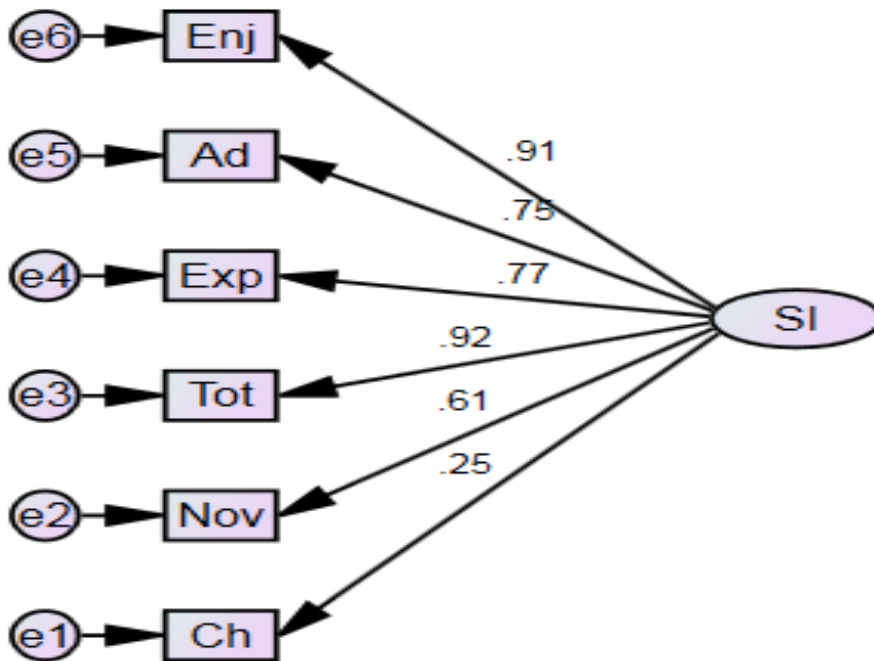


Figure 2.3: Model 1 standardized parameter estimates.

Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational interest; Nov = Novelty; Ch = Challenge; SI = Situational interest.

In Model 2, social indicators (needs support) were added (Figure 2.4)

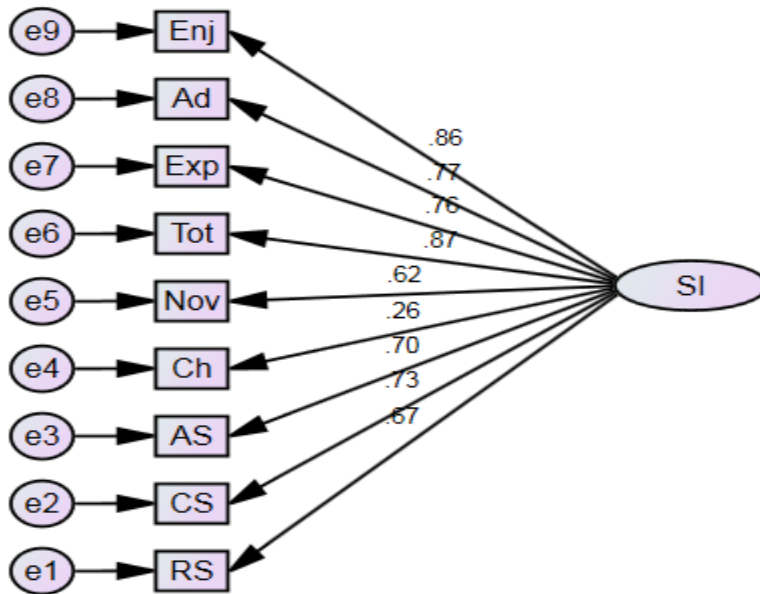


Figure 2.4: Model 2 standardized parameter estimates.

Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational interest; Nov = Novelty; Ch = Challenge; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest.

Model 3 is presented in Figure 2.5. This model dropped challenge due its low factor loading on situational interest.

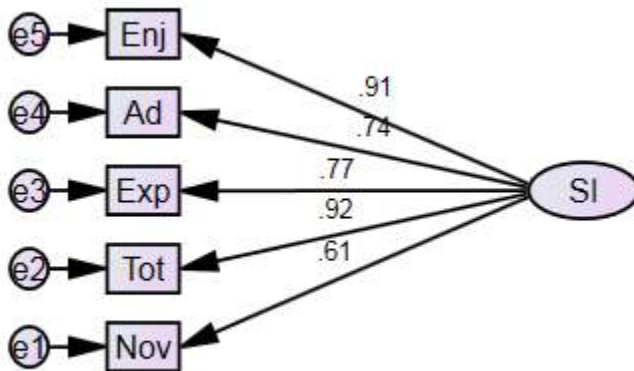


Figure 2.5: Model 3 standardized parameter estimates. Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational interest; Nov = Novelty; SI = Situational interest.

Model 4 represents a one-factor model with challenge dropped from the analysis (Figure 2.6).

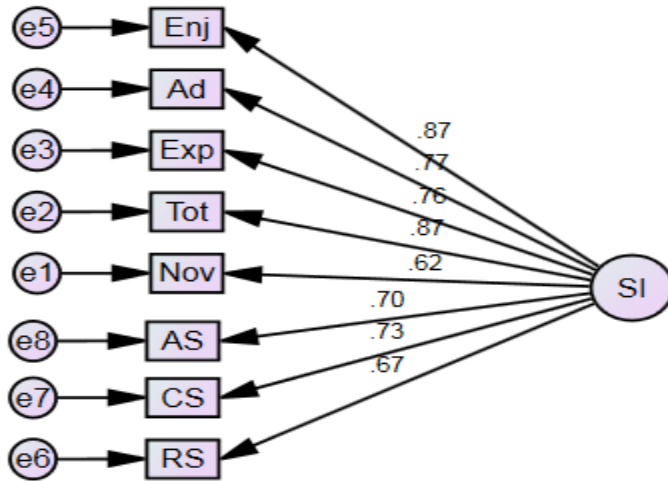


Figure 2.6: Model 4 standardized parameter estimates. Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational interest; Nov = Novelty; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest.

Model 5 delineates situational interest and needs support as two separate factors (Figure 2.7).

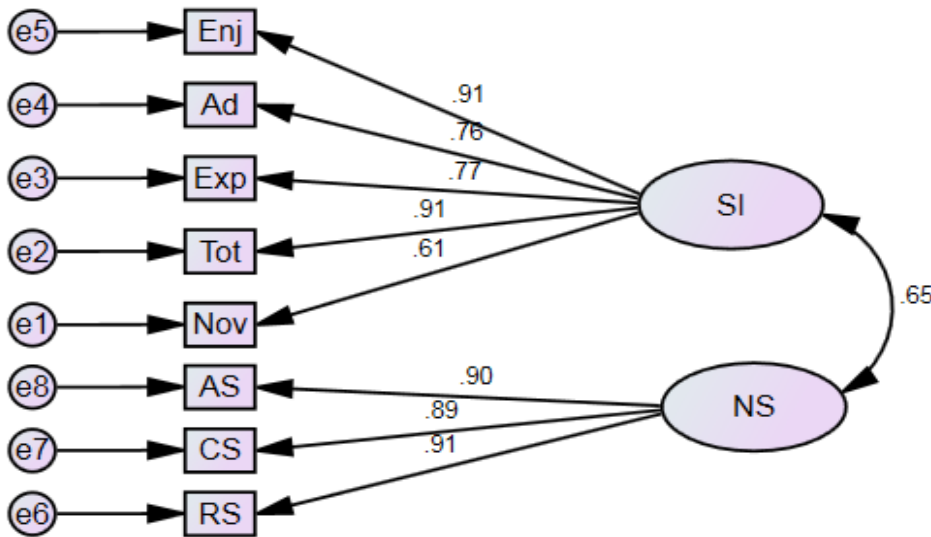


Figure 2.7: Model 5 standardized parameter estimates. Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total Situational interest; Nov = Novelty; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest; NS = Needs support.

Comparison of the five models are presented in Table 2.3. Results clearly show that needs support were not social indicators of situational interest. Rather, evidence supported treating needs support and situational interest as separate factors. The Model 5 values for CFI and TLI resulted in values that can be considered a good fit. The RMSEA value of .101 was over the .08 threshold (Goubert et al., 2004).

Table 2.3: Values for fit measures for tested models

Model	χ^2	df	CFI	TLI	RMSEA	AIC	BIC
Model 1	63.230	9	.957	.929	.125	87.230	134.762
Model 2	681.809	27	.728	.637	.250	717.809	789.107
Model 3	26.122	5	.983	.965	.104	46.122	85.732
Model 4	645.306	20	.734	.627	.284	677.306	740.682
Model 5	94.141	17	.968	.953	.101	128.141	195.478

Notes: Model 1 = situational interest factor with original six indicators; Model 2 = situational interest factor with added needs support social indicators; Model 3 = situational interest factor with five original factors – challenge removed; Model 4 = situational interest factor with social indicators but without challenge; Model 5 = situational interest and needs support as two separate factors.

Parameter estimates of Model 5 are presented in Table 2.4. Model 5 factor loadings suggested strong relationships between each factor and its indicators.

Table 2.4: Factor Loadings and Explained Variance for Final Model

Latent Variables & Indicators	UFL	SE	SFL	h^2
Situational Interest				.622
Novelty	.564	.045	.614	.377
Total Situational interest	1.000		.871	.759
Exploration Intention	.794	.046	.782	.611
Attention Demand	.762	.044	.785	.616
Instant Enjoyment	.920	.033	.863	.745
Needs Support				.809
Relatedness Support	1.000		.907	.822
Competence Support	.962	.037	.890	.792
Autonomy Support	.971	.036	.902	.814

Notes: UFL = unstandardized factor loadings; SE = standard error; SFL = standardized factor loadings; h^2 = amount of explained variance in each indicator accounted for by its factor.

H₂ and H₃ Findings

After preliminary CFA, the selected model was entered in the final analysis. As noted earlier challenge was dropped due to low loadings. The tested model had five situational indicators (check Figure 2.8).

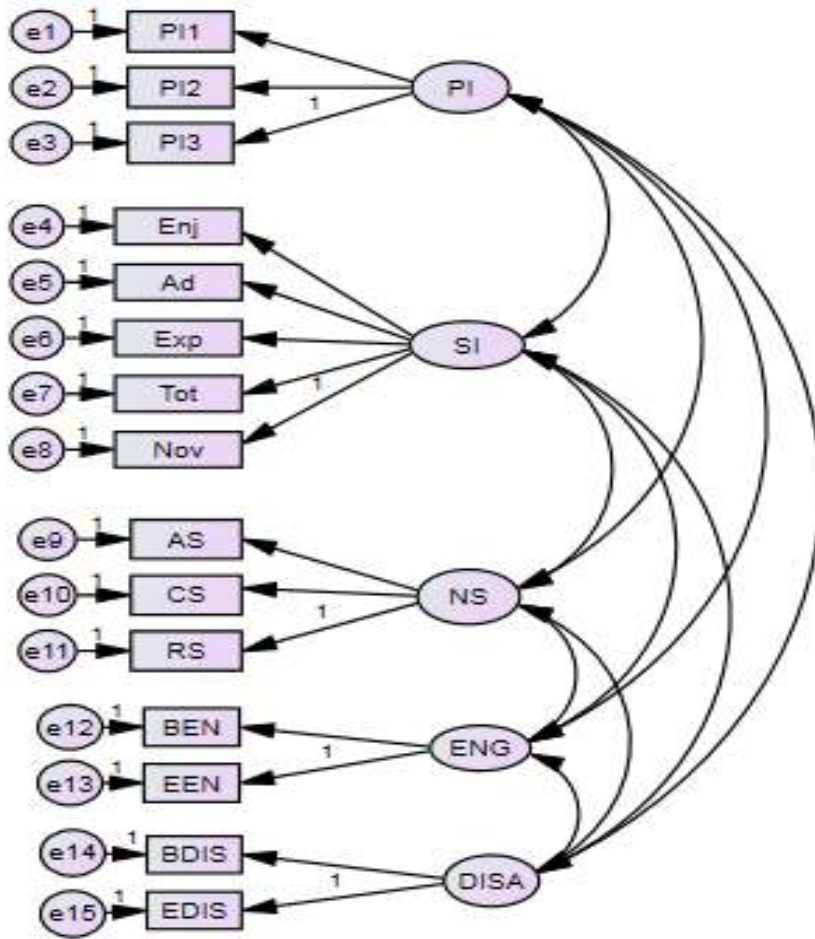


Figure 2.8: The final tested model. Notes: DISA = Disaffection; ENG = Engagement; NS = Needs support; SI = Situational interest; PI = Personal interest.

Internal reliability, means, and correlation results for latent variables are presented at the bottom of Table 2.5. Results reveal moderate correlation for all the variables except disaffection, which had weak correlation with situational interest and needs support. All variables had a mean score above 3 on the 5-point scale. Internal reliability for all variables ranged from acceptable to good values.

Table 2.5: Descriptive Statistics and Latent Variable Correlation Estimates.

Variables	1.	2.	3.	4.	5.
1. SI					
2. NS	.647				
3. PI	.614	.600			
4. ENG	.681	.578	.758		
5. DISA	.319	.318	.420	.416	
Mean	3.205	3.597	3.387	3.841	3.646
<i>SD</i>	.688	.890	.996	.789	.922
Alpha	.860	.927	.766	.919	.896

Notes: SI = Situational interest; NS = Needs Support; PI = Personal Interest; ENG = Engagement; and DISA = Disaffection.

In support of Hypothesis H₂, there was a moderate, positive correlation between situational interest with personal interest, which likely reflects the shared underlying interest construct. CFA test results partially supported hypothesis H₃. Surprisingly, the correlation estimate between situational interest and engagement was higher than correlation estimate between situational interest and personal interest. The correlation estimate between needs support and engagement was lower than the estimate between needs support and personal interest, which was consistent with hypothesis H₃. There was no negative association between disaffection and situational interest and needs support. Therefore, evidence only partially supported H₃.

Discussion

The goal of this study was to assess the benefits of adding social indicators to the situational interest construct in PE. Despite theory supporting the link between needs support and situational interest (Deci, 1992; Chen et al., 1999), previous studies have not examined social indicators (Chen et al., 1999; Chen & Darst, 2001; Chen & Darst, 2002; Rotgans & Schmidt, 2011; Sun et al., 2008). To that end, interest theory and SDT were integrated as framework to investigate the three hypotheses for this study.

Specifically, it was hypothesized that: (1) The addition of social indicators will improve model fit and increase common variance in situational interest above and beyond the current six-dimensional situational indicator model; (2) Situational interest and personal interest share a moderate positive relationship; and (3) Situational interest is related to student engagement (positive) and disaffection (negative) constructs.

Results from this study did not support H₁. Contrary to the hypothesis, the indicators of situational interest and needs support did not produce a single, meaningful factor. Thus, need supportive environments do not appear to be social indicators of situational interest; rather they represent aspects of the PE learning environment that are related but distinct from situational interest. It is possible that social indicators of situational interest may be embedded within the task itself rather than more widespread support factors. For example, specific task feedback related to task quality or outcome may be more closely aligned to situational interest than the questions asked of these students (e.g., teacher showed confidence in my abilities; teacher helped me improve). It is also possible that needs support is a source of situational interest. Specifically, teachers who use needs strategies may enhance the person-activity interaction (Deci, 1992) that is central to situational interest (Hidi & Renninger, 2006). For example, teachers who give students choices (i.e., autonomy support), use the names of students (i.e., relatedness support), or give clear instructions (i.e., competence support) may increase the likelihood for students to experience the person-task dimensions of situational interest such as exploration intention or instant enjoyment (Katz, Assor, Kanat-Maymon, & Bereby-Meyer, 2006; Reeve & Jang, 2006).

The low factor loading of challenge to the situational interest construct was also an issue that likely needs to be addressed in future research. The low loading coefficients and poor correlation between challenge and situational interest might be attributed to weak measure of

challenge. Although scientists propose optimal challenge as an indicator of situational indicators (Chen et al., 1999; Sun et al., 2008), items in this sub-scale designed to test challenge. At this point, it might be important to distinguish between optimal challenge and challenge. Optimal challenge entails a student accomplishing tasks that are perceived to be neither too hard nor too easy (Chen & Darst, 2013), whereas challenge is performing difficult tasks that require great mental and physical effort to accomplish. Further, challenge is the difficulty level associated with an activity (Sun et al., 2008). Studies show that students get bored with very easy tasks, and get frustrated and sometimes quit when tasks are very difficult. This sub-scale seems to test for challenge instead of challenge, making it difficult to fit in the theoretical framework of situational interest. Furthermore, this were not self-directed tasks. But these results should not be interpreted to suggest that challenge is not relevant to situational interest. Future studies should be conducted to revise the challenge subscale.

Following elimination of challenge, the rest of the variables had factor loading coefficients ranging from acceptable to very good (SFL = .61 to .91). Nonetheless, removing one indicator from the model is inconsistent with theoretical assumptions and previous studies (Chen et al., 1999; Hidi, 2001; Sun et al., 2008) that have proposed six indicators of situational interest. Certainly, item elimination leads to loss of information and unexplained variance indicated that there might be unexplored indicators that may be present (Marsh, Hau, & Wen, 2004).

The latent correlation between situational interest and needs support in Model 5 ($r = .650$) does support the hypothesized existence of a link between interest and self-determination theories, via needs support (Deci, 1992). In other words, it appears there is sufficient overlap between these two motivational constructs that needs further exploration. Future researchers may want to investigate the relationship between situational interest and needs support over time to

determine if needs support is a source of situational interest in PE rather than an internal part of the construct. It is also possible that there are reciprocal relationships between needs support and situational interest in PE, which could also be investigated in longitudinal studies. Because this study was cross-sectional, the temporal dynamics between the two constructs cannot be determined.

Consistent with H₂, situational interest demonstrated discriminant validity with personal interest by producing a moderate positive relationship. In other words, the underlying interest construct of situational and personal interest produced overlap but demonstrated they were not the same. These results are consistent with previous research findings (Shen, Chen, Scrabis, & Tolley, 2003). While examining students' personal and situational interest in dance, Shen and colleagues found that situational interest and personal interest were related ($r = .39$). In this study, the relationship between situational interest and personal interest included a variety of activities, and produced a higher correlation ($r = .614$) than Shen et al. (2003).

These outcomes further support research findings pointing to association between situational interest and personal interest (Hidi & Renninger, 2006). Existence of this relationship makes sense since researchers have articulated how teachers have the power to generate students' situational interest (Linnenbrink-Garcia et al., 2013; Mitchell, 1993). However, testing the interest development model over time PE has not been done, making the process purely theoretical now. Gaining a better understanding of the efficacy of the four-phase interest development model in PE would be a powerful contribution to the motivation literature. Specifically, improving researchers' and teachers' understanding of how situational interest develops into personal interest would provide numerous benefits to translating theory into

practice. This evidence could provide teachers with a method to go beyond triggering students' short-term interest, and allow them to more successfully facilitate long-term interest.

H₃ was partially supported. Surprisingly, situational interest produced a slightly higher correlation with engagement than personal interest. Theoretically, the relationship between situational interest and personal interest should be higher than situational interest with engagement, since personal interest is a construct associated with situational interest (Hidi & Renninger, 2016). Nevertheless, this should not be surprising since scientists have found that perceived situational interest is associated with engagement, engrossment, and individuals getting completely taken over by activity (Ainley, 2012; Sun & Rueda, 2012). Contrary to hypothesis H₃ that had postulated a negative association between situational interest with disaffection, these results point to a weak relationship between situational interest and disaffection construct ($r = .319, p > .05$). Theoretically, learning environments that elicit disaffection are unlikely to elicit or maintain situational interest (Ainley & Ainley, 2011). Because of this, teachers' focus should be on teaching strategies that support situational interest.

Practical Implications

Results from this study have a lot of implications for PE teachers. Other than the validity of this scale, this study elaborated the classroom support for attainment of situational interest. It is expected that teachers will benefit from this study by identifying factors that can support situational interest in PE classes. Teachers should understand that students' motivation is influenced by learning environments that promote situational interest and needs support indicators. In terms of situational indicators, PE teachers may select tasks and teaching strategies that support situational indicators such as enjoyment, novelty, and exploration intention. Secondly, it is recommended that teachers should create learning environments that support

students' basic needs (autonomy, competence, and relatedness). For instance, autonomy-support might be encouraged through student involvement in group formation and selection of tasks. Apart from this, teachers should endeavor to teach skills that resonate with students' competence level. Likewise, teachers must be aware of the strength of interpersonal relationships among students and between teachers and students. Students are motivated by teachers who provide feedback and encourage communication with/and among students.

Finally, it is vital for teachers to understand the relationship between situational interest and personal interest, besides engagement. Accordingly, upholding situational interest is likely to lead to personal interest, which might help sustain interest for a long time and in the process, improve student engagement. To work towards situational interest, it is recommended that teachers should select pedagogies that enhance students interest in learning. For instance, group work gives instant and relevant feedback to students. This study found a small relationship between situational interest and disaffection, suggesting that disaffection does not necessarily affect interest, and therefore emphasis should be on identifying critical factors that promote situational interest in PE classes.

CHAPTER THREE: TESTING AN INTEGRATED MODEL OF INTEREST THEORY AND SELF-DETERMINATION THEORY IN UNIVERSITY PHYSICAL ACTIVITY CLASSES

The relationship between perceived needs support, needs satisfaction, motivational orientations, and important physical activity (PA) outcomes have been widely documented in previous research (Amorose & Anderson-Butcher, 2007; Gunnell, Crocker, Mack, Wilson, & Zumbo, 2014; Standage, Duda, & Ntoumanis, 2003). Recently, scientists have identified direct and indirect relationships between autonomy support with autonomous motivation (Haerens, Aelterman, Vansteenkiste, Soenens & Van Petegem, 2015). It is currently less clear how these different motivation constructs relate to one's interests. To explore these relationships, Deci (1992) and Krapp (1999) have advocated for the integration of interest theory and self-determination theory (SDT).

Basic needs consist of three psychological factors: autonomy, competence, and relatedness (Ryan & Deci, 2002). Autonomy focuses on behavioral engagement that is self-endorsed. Competence focuses on engaging effectively in one's environment. Relatedness focuses on securing meaningful and fulfilling relationships. The social environment plays a significant role in satisfying one's needs. For example, in PA settings, teachers who can support students' autonomy (e.g., provide choices), competence (e.g., provide skill-related feedback), and relatedness (e.g., provide personal support) will likely satisfy students' needs. There is minimal evidence at this point, however, about the relation that needs support has with interest constructs. Therefore, the aim of this study is to investigate an integrated model of interest theory and SDT. By examining this prospect, the present study can provide empirical evidence about the structural relationships between interest theory and SDT.

Self-Determination Theory

Over the past few decades, SDT has emerged as a leading theory for examining student motivation (Deci, 1992; Ryan & Deci, 2002). The bases of SDT are the regulatory patterns that students undergo in the process of performing tasks. To that end, motivation is theorized to operate on a continuum (Figure 3.1) ranging from amotivation, through extrinsic motivation to intrinsic motivation (Ryan & Deci, 2000; Reeve, Deci & Ryan, 2004).

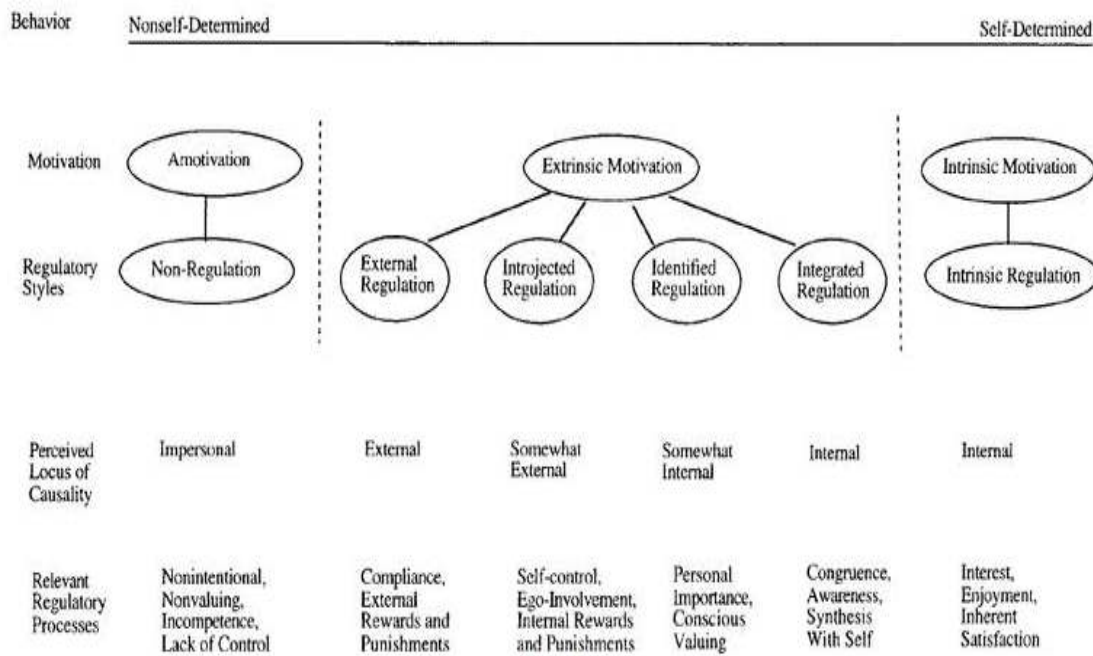


Figure 3.1: Self-Determination Continuum. Source: Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being (Ryan & Deci, 2000).

Individuals that are amotivated express feelings of incompetence, lack value for the activity, and have negative experiences (Reeve et al., 2004). Students at this stage of motivation do not see any reason for engagement in PA (Standage, Gillison, & Treasure 2007). Just like other forms of motivation, existing social factors have been found to drift people toward or away from amotivation (Ryan & Deci, 2002). For instance, marathoners whose motive for

participation is cash awards, may become amotivated and withdraw from championship in the event monetary reward is withdrawn.

External regulation is a highly-controlled form of motivation representative of a continued presence of external monitoring and rewards (Reeve et al., 2004). Individuals look forward to external rewards to motivate engagement in exercise and sport, and/or to avoid external punishment (Standage et al., 2007). With introjected regulation, behavior is no longer subject to external forces, but it is controlled by oneself (Reeve et al., 2004). Individuals rely on internal contingencies of reward or punishment to control their behaviors. Introjected regulation can be described as what individuals believe they ought to do. The person is controlled by feeling of guilt in case the task is not accomplished. Likewise, relatedness becomes an important indicator of motivation, especially the support gained from teachers and fellow students. It is worth noting that both external regulation and introjected regulation are highly controlled by pressure (external and internal) and contingencies (Ryan & Deci, 2002).

Identified regulation is the practice of engaging in PA because individuals value the benefits associated with a task or behavior (Reeve et al., 2004). A person believes that engaging in PA will help them achieve personal goals. For instance, an individual would engage in PA because he or she expects to attain good health. Integrated regulation is an extension of identified regulation, but at this stage behavioral engagement is well coordinated and assimilated as part of one's lifestyle and self-system (Ryan & Deci, 2000). The values attached to behavior are stable aspects of life and are part of one's personal identity (Reeve et al., 2004).

Intrinsic motivation represents engagement in an activity for its own sake (Ryan & Deci, 2000). Scientist agree that human beings are endowed with intrinsic motivation tendencies, and that maintenance and enhancement of autonomous motivation requires supportive social

environment. In PA settings, students are moved to act due to the fun or challenges encountered in the activity rather than external pressures or rewards (Ryan & Deci, 2000). Intrinsic motivation is considered the highest level of motivation and the goal of self-determined motivation is to help students attain autonomous motivation (Renninger, 2000).

SDT also distinguishes regulations more broadly as autonomous and controlled motivations (Ryan & Deci, 2000), which is the approach that is used in this research. Autonomous motivation describes the motivational dynamics of tasks that students do freely, but controlled motivations occur when students feel that they are being coerced or do not fully endorse engaging in tasks (Ryan & Deci, 2000). Autonomous motivations encompass intrinsic, integrated and identified regulations, whereas controlled motivations comprise introjected and external regulations. Autonomous motivation is considered a healthy and adaptive form of motivation whereas controlled motivation is an unhealthy and maladaptive form of motivation (Ryan & Deci, 2002).

One important precept of SDT is that autonomous motivation does not directly emerge from social factors (e.g., needs support), but instead is influenced by perceived needs satisfaction (Deci, 1992). Research has shown that social factors are directly related to needs satisfaction and indirectly related to motivation (Cox & Williams, 2008; Deci & Ryan, 1987; Gagne, 2003). Deci (1992) has discussed how situational interest may be related to SDT constructs, especially needs support and satisfaction. Likewise, Krapp (1999) has explored the relationship between personal interest with needs satisfaction and motivational orientations. Even though there appear to be links between needs support, needs satisfaction, motivation, and interest constructs, little research has been completed to clarify these relations. Therefore, the next section focuses on the theoretical integration of SDT and interest theory.

Interest Theory

Interest is categorized into situational interest and personal interest. Situational is the appealing effect of the characteristics of an activity on students, and personal interest is a psychological disposition in preference of an activity (Chen, Darst, & Pangrazi, 1999; Chen & Zhu, 2005). Researchers posit that personal and situational interest perform distinct functions towards student motivation (Chen et al., 1999; Sun, Chen, Ennis, Martin, & Shen, 2008). Specifically, situational interest typically attracts novice learners to be engaged in tasks, while personal interest is built on prior experience and guides long-term preferences for certain tasks or activities (Ryan & Deci, 2002; Zhu, Chen, & Parrot, 2014).

Due to the long-lasting nature of personal interest, scientists have concentrated on investigating situational interest. In other words, the rigid nature of personal interest makes it hard to alter. Linnenbrink-Garcia, Patall, and Messersmith (2013) posit that situational interest is malleable, and can be manipulated and elicited via the teaching strategies. In other words, pedagogical approaches influence acquisition and maintenance of situational interest. Further, it has been suggested that there is connection between person-task interactions and situational interest (Deci, 1992). Researchers have hypothesized that there are six indicators of situational interest associated with person-task interactions: attention demand; challenge; instant enjoyment; exploration intention; novelty; and total situational interest (Chen et al., 1999).

Attention demand is the mental energy and concentrated cognition required for learning PA (Sun et al., 2008). Challenge is the level of difficulty in relation to a student's ability (Sun et al., 2008). Sun and colleagues (2008) define instant enjoyment as the pleasure derived from engaging in PE. Exploration intention describes psychological aspects that require cognitive stimulation (Mitchell, 1993), and it is triggered by PA tasks that encompasses concentrated

cognition (Chen et al., 1999). Novelty is the gap between known information and information deficiency (Chen & Darst, 2001). Finally, total situational interest is the overall evaluation of student's situational interest in PE (Zhu et al., 2009).

Scientists contend that situational interest is part of the social environment in learning contexts (Linnenbrink-Garcia et al., 2013). More specifically, when the learning environment supports students' needs, it is likely to also trigger situational interest (Deci, 1992). According to Deci (1992), situational interest is a framework that can be used to explain how the social environment stimulates needs support and in turn influence needs satisfaction and motivational orientations. Deci (1992) has proposed that situational interest encompasses the person, activity, and the social environment. Students develop and maintain situational interest whenever their engagement in activities is completed in a social environment that upholds needs support. Nonetheless, a social environment that thwarts needs satisfaction is associated with controlled motivation and interest disruptions (Linnenbrink-Garcia et al., 2013). Despite literature pointing to close links between needs support and situational interest, previous research has not explored this relationship.

There also appear to be relations between personal interest and SDT motivation constructs. Krapp (1999) proposes that interest can be examined in terms of motivational disposition, characteristics of learning environment, or psychological states. According to Krapp (1999), the development of personal interest is often related to changes in motivational structure of an individual. Students often develop personal interest based on experiences and exposure to ideas over time. Thus, it seems plausible that students maintain personal interest in a task when they assess and feel that the task is valuable and emotionally satisfying (Krapp, 2005). Therefore, it appears that autonomous motivation can promote personal interest, while controlling

motivation is likely to undermine personal interest. Needs satisfaction may also stimulate personal interest (Krapp, 2005).

Recently, Gillet, Berjot, Vallerand, and Amoura (2012) conducted a study on high school students to investigate the influence of autonomous motivation on personal interest and intention to drop out of sports. It was established that athletes' personal interest in sports was significantly predicted by autonomous motivation. Examining the relationship between motivation and interest, Goudas, Biddle, and Fox (1994) established that students who reported autonomous motivation also revealed higher levels of personal interest, while controlled motivation was associated with boredom and disruption of the learning process. Furthermore, in the sports field, controlling coaches directly undermine needs satisfaction and indirectly lower engagement by creating environments that uphold disaffection and lack of interest (Curran, Hill, Ntoumanis, Hall, & Jowett, 2016). In one study, university students revealed that students reporting autonomous learning motivation also reported having high personal interest (Müller & Louw, 2004). Accordingly, this general pattern of relationships appears to be present across many contexts.

Finally, there is evidence pointing to a relationship between situational interest and personal interest. For example, a study of middle school students in physical education established a moderate, positive correlation between situational interest and personal interest (Shen, Chen, Scrabis, & Tolley, 2003). In this study, students who reported higher personal interest also seemed to be more cognizant of situational interest. Recently, Zhu et al. (2014) examined the association between situational and personal interest in different tasks. They found a positive correlation between personal and situational interest in both the PACER and 1-mile run tasks.

Experimental research conducted with college students in math and psychology classes point to more evidence linking situational interest to personal interest (Hulleman, Godes, Hendricks, & Harackiewicz, 2010). The study revealed that students in the treatment group focused on increasing situational interest reported a significant increase in personal interest at the end of the task, while those in the control group did not report any significant statistical difference. In conclusion, these findings support previous researchers who have suggested that there is relationship between situational interest and personal interest (Deci, 1992; Hidi & Renninger, 2006). In summary, it is evident that situational interest is associated with needs support and needs satisfaction. Also, needs satisfaction are directly and indirectly related to personal interest. Although the studies discussed in the previous paragraphs demonstrated links between SDT and interest theory, little empirical evidence is available to make empirical connections between the two theories in PA settings. Further, research that examines associations between SDT constructs and situational and personal interest is sparse.

Research Questions and Hypotheses

The aim of this study was to investigate associations between situational interest, needs support, needs satisfaction, autonomous and controlled motivations, and personal interest among college students enrolled in university PA classes. Research question and hypotheses tested were as follows:

1) What are the associations between student reports of situational interest, needs support, needs satisfaction, motivation, and personal interest?

H₁: Student reports of situational interest and needs support will have direct associations with needs satisfaction and indirect associations with motivation.

H₂: Student reports of needs satisfaction will have direct relations with motivation and personal interest.

H₃: Student reports of autonomous motivation (positive) and controlled motivation (negative) will have direct relations with personal interest.

H₄: Student reports of situational interest will have a direct association with personal interest.

Methods

Participants

Participants were 347 students (20.5% males and 79.5% females; mean age = 20.42 years, *SD* = 1.78) enrolled in kinesiology activity classes in a large research university in Southeastern United States. Of the students in the sample, 40.1% were seniors, 25.1% were juniors, 25.6% were sophomores, and 8.9% were freshmen. A majority (73.8%) of the participants reported a Caucasian ethnicity, while 17.6% reported African American, 4.9% Asian /Asian-American, 2.6%, Hispanic, 0.9%, Native American, and 3% Others.

Instrumentation

Situational interest. Indicators of person-task interactions were measured using the 24-item situational interest scale [(Chen et al., 1999), Appendix C]. Example items include: (1) “This activity is new to me” (novelty); (2) “This activity is complicated” (challenge); (3) “It is fun for me to try this activity” (enjoyment); (4) “I was very attentive all the time” (attention demand); (5) “I want to discover all the tricks of this activity” (exploration intention). Each item is answered on a 5-point scale ranging from (1) very untrue to (5) very true. This scale has been used widely in PA contexts.

Needs support. Measures of autonomy, competence, and relatedness support was measured with scales used by Standage, Duda, & Ntoumanis (2006). A total of 15 items (6 autonomy support, 4 competence support, and 5 relatedness support) are included in these scales (see Appendix D). Sample items measuring social indicators: During this activity..., : (1) “the teacher listened to how I would like to do things” (autonomy support); (2) “the teacher made me feel like I was good at this activity” (competence support); and (3) “the teacher encouraged me to work with others in practice” (relatedness support). Each item is answered on a 5-point scale ranging from (1) very untrue to (5) very true. Standage and colleagues report reliability in these scales.

Needs satisfaction. Needs satisfaction was measured using the Basic Need Satisfaction in Sport Scale ([BNSSS] Ng, Lonsdale, & Hodge, 2011). There are three subscales in the BNSSS that measure students’ autonomy, competence, and relatedness satisfaction (see Appendix F). Students were asked to respond to the items regarding their feelings and experiences in the activity class instead of sport. Each scale is comprised of 5-items. Autonomy satisfaction has 5 items (example, “In my class, I get opportunities to make choices”). Competence satisfaction was measured using 5 items (sample item is, “I can overcome challenges in my class”). Lastly, relatedness satisfaction questionnaire has five items (sample question is, “In my class, I feel close to other people”). Each item is measured on a 5-point scale ranging from (1) not true at all to (5) very true.

Motivation. Autonomous motivation (intrinsic & identified regulation) and controlled motivation (introjected & external regulation) were measured using a 20-item Perceived Locus of Causality Scale (PLOC) developed by Goudas et al. (1994). The PLOC comprises five four-item sub-scales that measure intrinsic regulation, identified regulation, introjected regulation,

external regulation, and amotivation. The scale was modified to replace “PE” with “activity class” (see Appendix F). Items begin with common stem “I take part in this activity class ...,” Sample response to intrinsic motivation is “.... because it is fun.” Example item measuring identified regulation is “.... because I can learn skills which I could use in other areas of my life.” Introjected regulation has items such as “.... because I want the teacher to think I’m a good student.” External regulation was measured using sample item “.... because I’ll get into trouble if I don’t.” Each item is answered on a 5-point scale ranging from (1) not at all true to (5) very true.

Personal interest. Personal interest toward PA was measured using Trautwein, Ludtke, Marsh, Koller, and Baumert (2006) personal interest scale (see Appendix H). The personal interest questionnaire contains three items assessing each student’s personal interest in PA. Students were asked to think about the PA course they are enrolled and answer questions about their interest in it (sample item is “Because this class is fun, I wouldn’t want to give it up”). Each item is answered on a 5-point scale ranging from (1) strongly disagree to (5) strongly agree.

Procedures

In accordance with Institutional Review Board (IRB), the researcher applied for permission to conduct research. The researcher then liaised with the university PA course instructors to schedule date and time for data collection. During the data collection sessions, the researcher first distributed consent forms, and those participants who accepted to participate in the research were issued questionnaires. The researcher then distributed surveys, outlined the instructions for filling the survey, explained the procedure, and answered questions from the participants. The instructors stepped outside when questionnaires were administered.

Data were collected during four-week window. At data point one, the participants filled a questionnaire focusing on basic demographic information (activity class, age, gender,

classification, and race), indicators of situational interest, and needs support. Data point two was conducted after four weeks. At data point two, the questionnaires assessed needs satisfaction, motivation, and personal interest. Data were collected from eight PA classes: tennis; tai chi; jogging; yoga; boot camp; weight training; aerobic dance; and golf. In both phases, participants took approximately 10-15 minutes to fill the questionnaires.

Data Analysis

Prior to data analysis, screening was done for input accuracy, missing data, normality, and outliers. A series of confirmatory factor analyses (CFA) were used to disentangle relationships between situational interest and needs support. Specifically, CFAs were used to determine if situational interest and needs support represented a single factor of the social environment or two related but separate factors of the social environment. Structural equation modeling (SEM) was used to simultaneously test hypotheses H₁, H₂, H₃, and H₄.

SEM is an approach that combines a measurement model and structural model (Kline, 2015). The measurement model consists of using CFA procedures to determine how well the theorized covariance matrix matches the sample covariance matrix (i.e., overall model fit and parameter estimates). The structural model consists of a series of regression equations that provide information on relationships among latent variables in the structural model. In other words, SEM is designed to test theoretical relationships between latent constructs, apart from testing direct and indirect effects, and mediating relationships among variables (Byrne, 2013). SEM assumes that all variables measured have some unique variance and error that must be accounted for in the explanatory model (Byrne, 2013). One major strength of SEM, therefore, is that it parcels reliable variance from unique variance and measurement error in the same fashion

as CFA. Notwithstanding, being a cross-sectional study, SEM cannot determine causal relationships.

The theorized model is provided in Figure 3.2. The identification of the model consists of both latent and observed variables. Situational interest, needs satisfaction, and personal interest were latent variables while autonomous motivation (i.e., intrinsic; identified) and controlled motivation (introjected; external) were observed variables consisting of a composite score.

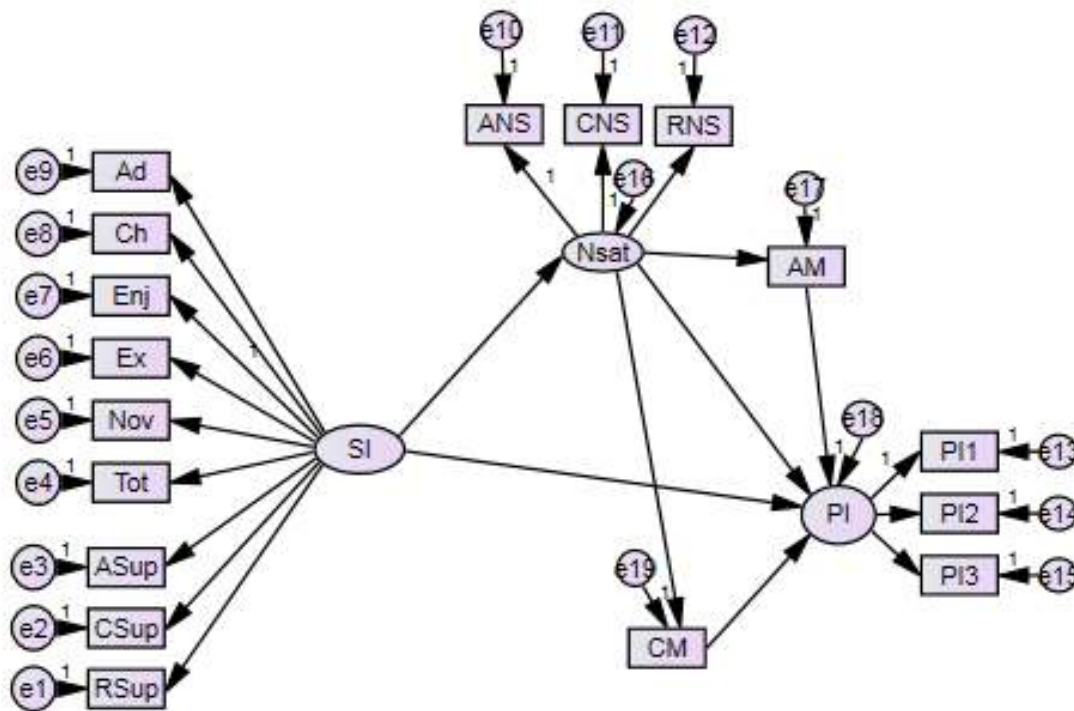


Figure 3.2: Theorized Model. Notes: CH = Challenge; Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total situational interest; Nov = Novelty; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest; Nsat = Needs satisfaction; AM = Autonomous motivation; CM = Controlled motivation; PI = Personal interest.

Routine data screening procedure was used to assess the assumptions of structural equation modeling: Multivariate normal distribution; linearity; outlier; sequence; non-spurious

relationship; model identification; sample size; uncorrelated error terms (Kline, 2015). H₁, H₂, H₃, and H₄ was tested using SEM in IBM AMOS version 22. Model fit is based on generally accepted thresholds for the chi-square goodness-of-fit test (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the root-mean-square error of approximation (RMSEA) (Hooper, Coughlan, & Mullen, 2008). CFI and TLI values ≥ 0.90 reveal an adequate fit and values $\geq .95$ reflect a good fit of the model (Goubert, Crombez, Van Damme, Vlaeyen, Bijttebier, & Roelofs, 2004). Generally, the cut-off value for RMSEA is .06 (Hooper et al., 2008), even though values ≤ 0.08 indicate realistic errors of approximation in the population (Goubert, et al., 2004).

Results

Descriptive Statistics

Descriptive statistics, internal reliability coefficient (Cronbach's alpha), and correlation estimates for the indicators of situational interest are presented in Table 3.1.

Table 3.1: Internal Reliability, Means, and Correlations for Measured Variables

Variables	1	2	3	4	5	6	7	8	9
1. Ad	1								
2. Ch	.122*	1							
3. Enj	.585**	.183**	1						
4. Ex	.440**	.202**	.587**	1					
5. Nov	.271**	.236**	.311**	.405**	1				
6. Tot	.496**	.145**	.847**	.558**	.359**	1			
7. AS	.375**	-.047	.353**	.240**	.088	.294**	1		
8. CS	.360**	-.051	.318**	.185**	.127*	.266**	.767**	1	
9. RS	.274**	-.030	.287**	.180**	.117*	.223**	.718**	.831**	1
Mean	3.819	2.935	3.866	3.585	3.227	3.916	4.096	4.416	4.438
SD	.724	.768	.644	.767	.851	.711	.605	.541	.553
Alpha	.862	.696	.844	.833	.711	.899	.876	.889	.899

Notes. Ad = Attention Demand; Ch = Challenge; Enj = Enjoyment; Ex = Exploration Intention; Nov = Novelty; Tot = Total situational interest; AS = Autonomy support; CS = Competence support; RS = Relatedness support. *. Correlation is significant at the 0.05 level (2-tailed).

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

Significant correlations were noted among the variables in the 2 sub-scales in situational interest and needs support sub-scales. The highest correlation was between instant enjoyment and total situational interest. Novelty and challenge had weak correlations with the each of the situational interest indicator variables. All the observed variables had mean above the mid-point of 5-likert scale. Overall, there were positive correlations between autonomy support (AS), competence support (CS), and relatedness support (RS). AS, CS, and CS had a mean above 4 on 5-point scale.

Confirmatory Factor Analysis

A series of confirmatory factor analysis tests were performed to examine the factor structure of situational interest. Specifically, a total of four models were tested. Model 1 was a single factor model that included 6 indicators of situational interest and 3 needs support indicators. Model 2 was a two-factor model that included a situational interest factor with 6 indicators and a needs support factor with its 3 indicators. Model 3 was a modified two-factor model that excluded challenge and novelty which had low factor loadings. Model 4 consisted of a 3-factor model that added a third factor that represented secondary situational interest that encompassed challenge and novelty.

Fit indices are provided in Table 3.2. Results show that Model 3 presented a good fit, $\chi^2 = 42.058$, $df = 13$, $p < 0.05$, CFI = .980, TLI = .968, RMSEA = .071, SRMR = .050.

Table 3.2: Tested models

Model	χ^2	SB- χ^2	Df	CFI	TLI	RMSEA	SRMR
Model 1	745.171	643.170	27	0.531	0.375	0.256	0.159
Model 2	99.422	88.257	26	0.953	0.934	0.083	0.059
Model 3	42.058	35.443	13	0.980	0.968	0.071	0.050
Model 4	87.081	77.156	24	0.960	0.939	0.080	0.054

The CFA results did not support a single situational interest – needs support factor as originally hypothesized in the SEM analysis. Specifically, it was revealed that needs support is a different factor, and not part of situational interest. As mentioned earlier, challenge and novelty were also dropped from the final model. Based on this outcome, Model 3 was selected and entered in the SEM analysis.

The model tested in SEM is shown in Figure 3.3.

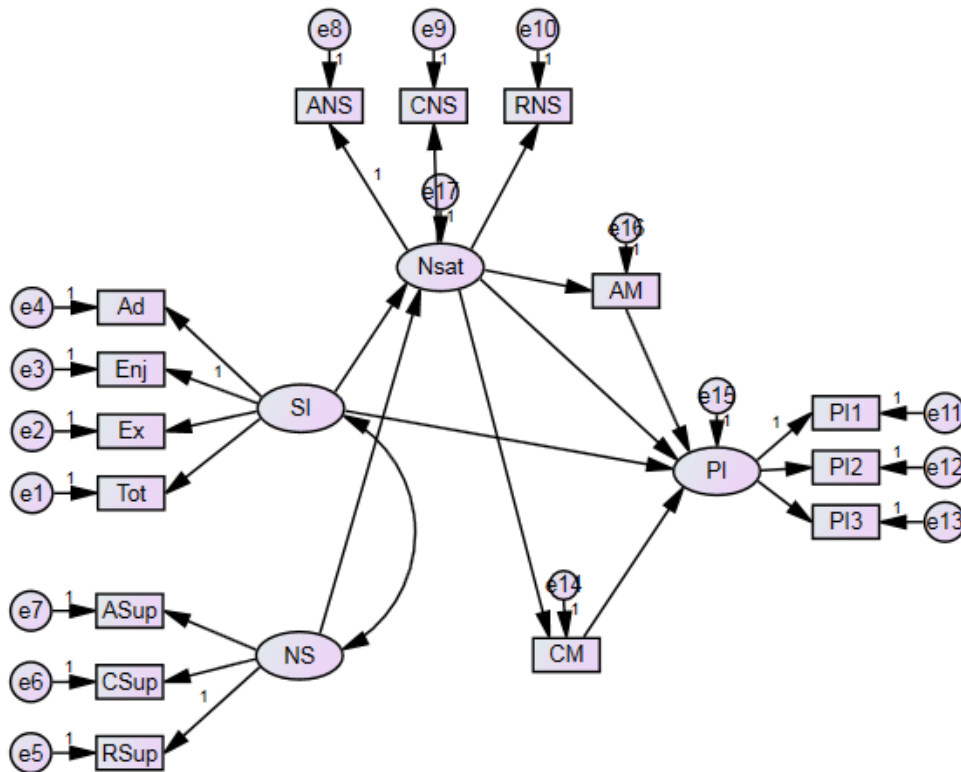


Figure 3.3: Revised SEM Model. Notes: Enj = Instant enjoyment; Ad = Attention demand; Exp= Exploration intention; Tot = Total situational interest; Autonomy support; CS = Competence support; RS = Relatedness support; SI = Situational interest; NS = Needs support; Nsat = Needs satisfaction; AM = Autonomous motivation; CM = Controlled motivation; PI = Personal interest

The factor loadings, explained variance, and unexplained variance for the indicators of situational interest and needs support are presented in Table 3.3. Situational interest explained the greatest percentage of variance in instant enjoyment (93%), and least percentage in attention

demand (37%). Besides, needs support explained prominent level of variance in autonomy, competence, and relatedness support.

Table 3.3: Model 3 Factor Loadings and Explained and Unexplained Variance

Factors	UFL	SE	SFL	h ²	u ²
Situational Interest					
Attention Demand	1.000		0.606	0.368	0.632
Instant Enjoyment	1.413	0.141	0.964	0.929	0.071
Exploration Intention	1.094	0.117	0.618	0.382	0.618
Total Interest	1.425	0.136	0.877	0.769	0.231
Needs Support					
Autonomy Support	1.000		0.818	0.669	0.331
Competence Support	1.028	0.046	0.941	0.885	0.115
Relatedness Support	0.985	0.052	0.881	0.777	0.223

Notes: UFL = unstandardized factor loadings; SE = standard error of UFL; SFL = standardized factor loading; h² = explained variance of indicator by factor; u² = unexplained variance of indicator.

To gain an understanding of the relationship among the latent and observed variables in the proposed model, correlations were tested. Correlations, means, and internal reliability results for the variables are presented in Table 3.4.

Table 3.4: Internal Reliability, Means, and Correlations for Latent Variables in SEM

Variables	1	2	3	4	5	6
1. PI						
2. Nsat	.427**					
3. AM	.599**	.573**				
4. CM	-.153**	.032	-.051			
5. SI	.312**	.235**	.418**	-.074		
6. NS	.254**	.385**	.248**	-.022	.301**	
Mean	3.459	3.881	3.903	2.707	3.558	4.317
SD	0.757	0.472	0.609	0.638	0.514	0.521
Alpha	0.749	0.865	0.882	0.835	0.896	0.945

Notes: PI=Personal interest; Nsat=Needs satisfaction; AM = Autonomous motivation; CM = Controlled motivation; SI = Situational interest; NS = Need support; **. Correlation is significant at the 0.01 level (2-tailed).

Results point to moderate correlation between needs satisfaction and autonomous motivation, and a weak but significant correlation between needs satisfaction and personal

interest. Further, situational interest is positively correlated with needs satisfaction and personal interest. There is a moderate correlation between autonomous motivation and personal interest. A small negative correlation is present between personal interest and controlled motivation. Weak, but significant correlation is present between needs support and needs satisfaction. Finally, results revealed positive correlation between situational interest and needs support. All the variables have an acceptable internal reliability of over .70.

Structural Equation Modeling

SEM Analysis was used to test the measurement model and structural relationship between interest theory and self-determination theory constructs. Based on the goodness of fitness tests, the sample covariance matrix from the model presented an acceptable fit, $\chi^2 = 195.825$ $df = 83$, $p < 0.05$, CFI = .953, TLI = .932, RMSEA = .063, SRMR = .049. Regression coefficients and explained variances among latent variables (needs satisfaction, autonomous motivation, controlled motivation, and personal interest) are presented in Table 3.5.

Table 3.5: Regression Coefficients and R-Square Values of SEM Analysis

Structural Relationships	B	SE	p-value	β	R ²
Needs Satisfaction					0.332
Situational Interest	0.302	0.048	0.001	0.418	
Needs Support	0.248	0.058	0.001	0.272	
Autonomous Motivation					0.602
Needs Satisfaction	1.060	0.104	0.001	0.776	
Controlled Motivation					0.003
Needs Satisfaction	-0.075	0.088	0.395	-0.052	
Personal Interest					0.573
Situational Interest	0.039	0.045	0.382	0.053	
Needs Satisfaction	0.360	0.144	0.012	0.351	
Autonomous Motivation	0.294	0.083	0.001	0.446	
Controlled Motivation	-0.129	0.035	0.001	-0.180	

H₁ Findings. SEM results partially supported H₁. There was a direct relationship between situational interest and needs satisfaction and needs support and needs satisfaction. Situational interest had a positive indirect association with autonomous motivation ($\beta = .325$, $p < .05$)

through needs satisfaction. There was not an indirect relationship between situational interest and controlled motivation ($\beta = -.022, p > .05$). Similarly, needs Support had a positive indirect association with autonomous motivation ($\beta = .211, p < .05$) through needs satisfaction but no indirect relation was present with controlled motivation ($\beta = -.014, p > .05$).

H₂ Findings. Hypothesis H₂ was partially supported. Results revealed a strong relationship between needs satisfaction and autonomous motivation. However, the relation between needs satisfaction and controlled motivation was not significant. Finally, results revealed a significant direct relationship between needs satisfaction and personal interest.

H₃ Findings. Results fully supported H₃. There was direct positive association between needs satisfaction and personal interest as well as autonomous motivation and personal interest. The relationship between controlled motivation and personal interest was negative with a weak magnitude.

H₄ Findings. Contrary to hypothesis H₄, the relationship between situational interest and personal interest is not significant. This outcome contradicts previous findings that have supported this association (Chen & Darst, 2001).

Discussion

This study explored the structural relationships between interest theory and SDT. Specifically, it investigated the relationships between situational interest, needs support, needs satisfaction, autonomous motivation, and personal interest among college students enrolled in PE classes. Prior to testing major study hypotheses, CFA tests were used to examine needs support constructs, autonomy support, competence support, and relatedness support as potential indicators of situational interest. This section is organized around the explanation of initial CFA findings followed by results of the four study hypotheses.

Nature of Situational Interest and Needs Support

Although a 9-indicator model of situational interest that integrated dimensions of needs support was hypothesized, findings were not supportive. Specifically, results clearly showed that situational interest and needs were separate factors. It should also be noted that the correlation between needs support and situational interest was positive, but small-to-moderate, which also points to less overlap between these two aspects of the social environment. The role of social indicators in situational interest from an SDT perspective remains uncertain despite clear theoretical links (Deci, 1992). It is possible that needs support is a source of situational interest rather than part of its internal dynamics. It is also possible that situational interest and needs support are two distinct aspects of the social environment in PA settings. Because this is a cross-sectional study without a random sample, the design cannot establish causation. Future research should investigate the relationship between needs support and situational interest to ascertain if it is a reciprocal relationship or if needs support may be a necessary source to facilitate situational interest.

In this study, challenge and novelty were poor indicators of situational interest. In the past literature, the relationship between challenge and other situational interest indicators produced conflicting results. For instance, some studies have found moderate correlation between challenge with total situational interest (Chen & Darst, 2001; Chen et al., 1999; Zhu et al., 2009). Notwithstanding, at least one study reported insignificant relationship between challenge with total interest (Ding, Sun, & Chen, 2013). In this findings, the insignificant association between challenge and other situational interest indicators supports the notion that challenge has an inconsistent association with situational interest (Chen, Darst, & Pangrazi, 2001).

Research findings on the relationship between novelty and situational interest have been conflicting. Using CFA, Chen et al. (1999) established novelty as an indicator of situational interest with acceptable loadings, even though it accounted for a very low proportionate variance in situational interest. In a study involving elementary children, Sun et al. (2008) affirmed the relationship between novelty and situational interest by revealing a significant loading (.99) on situational interest factor. In a study with middle school children, Chen et al. (2001) did not find a direct relationship between novelty and situational interest. Accordingly, novelty seemed to influence challenge, which in turn had a trivial effect on situational interest. In conclusion, there are conflicting reports about the relationship between novelty and challenge with situational interest. In this study, challenge and novelty were not indicators of situational interest, and therefore they were eliminated from the tested model. Despite the hypothesized model undergoing modifications, the final model met the cut-off criteria (Goubert et al., 2004; Kline, 2015; Marsh, Hau, & Wen, 2004) and therefore can be interpreted meaningfully.

Integration of Interest and Self-Determination Theories

Overall, findings generally supported the integration of interest theory and SDT. However, relations appear to be clearer for the integration of personal interest into SDT compared to situational interest. In this section, discussion about the major study hypotheses are discussed in greater detail. Results partially support hypothesis H₁ by identifying the direct relationship between situational interest and needs satisfaction as well as needs support and needs satisfaction. Central to both SDT and interest theory is the assumption that elements of the social environment influence needs satisfaction (Deci, 1992; Krapp, 2005; Standage et al., 2006). Previous research has not investigated the joint contributions of situational interest and needs support on needs satisfaction. It should be noted that situational interest was a stronger predictor

of needs satisfaction compared to needs support, which was surprising. This is a unique finding with important implications. Specifically, person-task interactions associated with situational interest (e.g., attention demand; instant enjoyment) appear to be a meaningful source for needs satisfaction above and beyond needs support. Therefore, situational interest appears to be closely intertwined with students' needs satisfaction in university PA classes.

Results also established an indirect relationship between situational interest and autonomous motivation through needs satisfaction. Scientists agree that autonomous motivation is dependent on interactions within the social environment through learning approaches that support the three needs (Ryan & Deci, 2002). Understanding this relationship is vital because of the role of teachers in helping students develop situational interest (Linnenbrink-Garcia et al., 2013). Teaching and learning strategies that encourage situational interest and needs support clearly enhance autonomous motivation when students experience needs satisfaction. Autonomous motivation can be enhanced when teachers design learning activities to make students explore acquired tasks beyond what they have learned, provide task options, and help students take ownership of their learning (Standage & Ryan, 2012).

As hypothesized (H₂), perceived needs satisfaction was directly associated with autonomous motivation. This outcome is consistent with principles of SDT which holds that autonomous motivation is influenced by the extent to which the three needs are satisfied (Standage, et al., 2006). On account of this, students' autonomous motivation is anchored to the extent to which students have opportunities to exercise their own volition, are competent to participate in class activities, and get positive feedback, among other means of relatedness. Nonetheless, results from this sample indicate a lack of relationship between needs satisfaction and controlled motivation, contradicting the hypothesis and theoretical undertones of SDT. For

example, a study with college athletes found a negative association between needs satisfaction and controlled motivation (Gagne, 2003). Athletes whose coaches applied controlled motivation reported lower levels of needs satisfaction. For this reason, future studies might need to explore the relationship between needs satisfaction and controlled motivation. Lastly, results supported H₂ by revealing a direct relationship between needs satisfaction and personal interest. Hence, these outcomes support theoretical approach (Krapp, 1999) suggesting that students' personal interest is directly associated with needs satisfaction.

In support of H₃, students' perceived autonomous motivation had a direct relationship with personal interest. These findings are consistent with literature that link autonomous motivation with students' personal interest (Krapp, 1999, 2005). In other words, students' personal interest is predisposed in a learning environment that is autonomously motivating. Although weak, there is a significant negative association between controlled motivation and personal interest. This finding supports Krapp (1999) who has postulated that personal interest is negatively predisposed by controlled motivation. Students that are exposed to controlling learning environment might report low levels of personal interest.

Contrary to H₄, results from this study did not find a direct association between students' personal interest and situational interest in PA. This contrasts with the theoretical undertone of interest theory and past research findings that have suggested a direct relationship between these two variables (Chen et al., 1999; Shen et al., 2003). It is possible that students' amount of personal interest toward the class content was already well established, reducing the impact of situational interest. Also, previous studies were done in PE which is different from PA settings. Situational interest is hypothesized to be geared for novice learners (Ryan & Deci, 2002; Zhu et al., 2014). University students may be beyond this point in their learning of the physical

activities. Similarly, it is also possible that the timing of situational measurement may have been an issue. Situational interest was measured toward the end of an 18-week semester where the class met three times per week. This may have minimized the relationship between situational interest and personal interest.

In summary, findings support previous researchers who have suggested that there is a connection between interest theory and SDT (Deci, 1992; Krapp, 1999). However, it is important to note that this research has limitations. First, results from CFA did not support the hypothesized model, which resulted in testing alternative models. Secondly, this was a cross sectional study and therefore the results do not portray causal effect. For instance, it is difficult to determine if there is causal relationship between needs support and situational interest. Future longitudinal studies can be done with specific interventional strategies. Also, future studies may focus on one task to determine if there is a difference in the outcome. Finally, it is recommended that in the future a longitudinal study be done to investigate if there is any causal relationship between needs support and situational interest.

CHAPTER FOUR: SUMMARY AND CONCLUSIONS

Despite the known benefits, it is evident that many school children and college students do not participate in adequate physical activity (CDC, 2016). School PE programs can provide excellent opportunities for physical activity to all children as well as imparting desirable knowledge and skills to initiate and maintain an active lifestyle (Society of Health and Physical Educators [SHAPE], 2017). Unfortunately, current research points to low levels of interest and motivation towards PE and PA. Interest or lack of interest differentiates between motivated and unmotivated students (Ullrich-French, Cox, & Bumpus, 2013). Even though social characteristics of the learning environment are associated with situational interest in PE and PA settings, up to now there has only been a suggestion that autonomy support, competence support, and relatedness support are potential indicators of situational interest (Deci, 1992). Hence, the purpose of this dissertation was to explore the social indicators of situational interest in PE and PA classes, as well as to investigate the integration of interest and self-determination theories.

To address the aims of this research, two quantitative studies were completed. The first study explored situational interest in middle school PE. Specifically, whether or not there are measurement advantages to adding social indicators was investigated. An integrated model of interest theory and SDT in university PA classes was tested in the second study. These theories are relevant motivational theories that focus on underlying factors of PE and PA engagement or disengagement (Deci, 1992; Chen et al., 2001). Whereas the first study looked at PE and second study focused on PA, they are different but related things. Middle school students are getting PE, while university students are in self-selected PA classes. Notwithstanding, it is suggested effective teaching of PE should lead to increased PA (SHAPE, 2017).

Results of the first study show that needs support are not indicators of situational interest, but they encompass aspects of the learning environment that are related to situational interest. Also, this study revealed two factors (situational interest and needs support) and not one factor, as had been hypothesized. Even though this study did not test for sources, findings suggest it is possible that needs support may be a source of situational interest. This study established association between needs support and situational interest, yet the indicators needs support did not fit on the situational interest factor. However, it is not known whether this relationship is reciprocal or causal.

This study provides evidence of the correlation between situational interest and personal interest among middle school students. The relationship between situational and personal interest suggests that prior to participating in PE classes, students already have past experiences and knowledge. Evidence from past studies show that students with experience tend to score higher in situational interest (Huang & Gao, 2013). Participants might have developed personal interest from the experiences they gained in elementary schools. It is also possible that students completed similar tasks throughout the school year, and personal interest was already established from this involvement. Knowing the entry level of students helps teachers determine the subject content, select tasks, and structure PE classes.

Results also provide insight into the relationship between situational interest, personal interest, and engagement. The findings support previous studies that have reported an association between interest and engagement (Huang & Gao, 2013). Results suggest that teachers must consider the relationship between situational interest, personal interest, and engagement. Understanding this relationship is vital in applying situational interest to motivate students, understanding students' entry levels, and eventually boost PE and PA engagement. If teachers

create learning environments that promotes needs support and situational interest, it appears likely that students will engage in PE and PA at higher levels. Surprisingly, there was not a relationship between situational interest and disaffection. Further investigation is required to determine the connection between situational interest and disaffection.

The second study partially supported the structural relationship between interest theory and SDT. Evidence point to direct association between situational interest and needs satisfaction and an indirect association between situational interest and autonomous motivation. The relationship between situational and personal interest in Chapter 3 was attributed to needs satisfaction and autonomous motivation.

One of the important findings from this study is the indirect association between situational interest with personal interest, and needs satisfaction with personal interest. Previous research findings have either reported a direct or insignificant relationship between situational interest and personal interest (Chen et al., 1999; Hidi & Renninger, 2006). Hence, findings from this study suggest that needs satisfaction plays a key role in supporting the structural relationship between interest theory and SDT. In addition, autonomous motivation appears to provide a linkage between needs satisfaction and personal interest.

Findings from this study have significant implications for teachers. Scientists have categorized interest into situational and personal. Teachers have influence on situational interest, especially through teaching pedagogies. Therefore, it is critical for teachers to develop the pedagogical tools that trigger and maintain student situational interest (Linnenbrink-Garcia et al., 2013). Evidence from this study suggests that person-task interactions such as attention demand and exploration intention as well as needs support factors such as autonomy-support impact students' motivation. Like previous research in PE, the instant enjoyment indicator of situational

interest appears to be a powerful one (Chen et al., 1999, 2001). From the person-task interaction perspective, students develop situational interest in tasks that are enjoyable, provide opportunities to explore and support cognitive aspects. Despite the problems emerging from the challenge and novelty indicators in this dissertation, at least one study has shown that students would report high situational interest if they feel the task provides additional information (Huang & Gao, 2013). Therefore, teachers must remember that students get bored and lose motivation when they perform the same task. Educators might consider strategies that will introduce novel activities with optimal challenge.

Teachers also ought to develop teaching strategies that support students' needs. For instance, teachers can enhance autonomy support by providing a variety of tasks and letting students choose from the available options (Reeve, Jang, Carrell, Jeon, & Barch, 2004). Reeve and colleagues show that students develop a sense of responsibility and interest in a task whenever the learning environment supports autonomy. Teachers can support competence by providing tasks that are congruent with students' skill level. Teachers should avoid teaching tasks that are too complicated. In addition, the tasks should be age appropriate. Provision of emotional support and immediate feedback has been found to elicit relatedness (Rotgans & Schmidt, 2011). Overall, it is imperative for teachers and other educators to understand students' competence levels, provide various optional tasks, and connect with the students.

Findings suggest that controlled motivation inhibits students' personal interest. It is essential for teachers to keep in mind that students' personal interest is thwarted by controlling learning environment (Reeve et al., 2004). Thus, teachers should avoid controlled motivations such as using material rewards to reinforce a behavior. External rewards only lead to temporary engagement with a task which diminishes when the reward is withdrawn (Deci & Ryan, 2008).

Besides, results from this study support the connection between autonomous motivation and personal interest. Therefore, teachers should find ways to establish autonomous motivation, which may in turn enhance personal interest. This finding is very significant since it affirms the proposed integration of interest theory and SDT.

In conclusion, results from this study contribute to research in three ways. First it addresses the connection between social indicators and situational interest. Evidence from this study point to this relationship, even though it does not indicate the type of relationship. Interestingly, despite what scientists have suggested, needs support is not an indicator of situational interest. Future studies should further examine the relationship between needs support and situational interest. In addition, future studies should investigate challenge and novelty subscales.

Secondly, this study investigated the relationship between situational interest and personal interest, engagement, and disaffection. Notwithstanding, future studies should investigate the association between situational interest and disaffection. Theoretically, there ought to be negative relationship between situational interest and disaffection. Researchers might explore other sources of disaffection.

Thirdly, this study examined the integration of interest theory into SDT by investigating the structural relationships among situational interest, personal interest, needs satisfaction, needs support, motivational orientations and personal interest. Future studies should continue to investigate the direct relationships between situational interest and personal interest, and needs satisfaction and controlled motivation, in PA setting.

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APPENDIX A: EXTENDED REVIEW OF LITERATURE

It is recommended that adults engage in an hour of moderate physical activity (PA) on most days of the week to accrue health enhancing benefits associated with an active lifestyle, but a high proportion of the population does not meet the recommended PA guidelines (Centers for Disease Control and Prevention [CDC], 2014). It is estimated that about 32% of the adult population in United States is sedentary, and only 21% of the population meets the recommended PA guidelines (American Heart Association, 2013). Motivational theories may assist the understanding of this phenomenon because they seek to explain and predict underlying motives for behavioral engagement or avoidance. PA interest, or a lack of it, may discriminate between individuals that meet PA guidelines and those who do not (Ullrich-French, Cox, & Bumpus, 2013). Interest theory identifies two types of interest, which are situational and personal (Hidi, 2001). Of great relevance to this study is situational interest, since research shows it can be manipulated to produce behavioral changes. In the face of evidence pointing to novelty, instant enjoyment, challenge, attention demand, and exploration intention as sources of situational interest (Chen & Darst, 2001), other researchers argue that social factors are important nutriments to be considered as sources of situational interest (Deci, 1992; Ryan & Deci, 2000).

The Task Force on Community Preventive Services (2002) has also provided a diverse set of recommendations for enhancing PA, with social factors appearing to be prominent facilitators. Social factors are defined as conditions supporting an individual's experience of autonomy, competence, and relatedness that arguably foster the most volitional and high-quality forms of motivation and engagement for activities (Ryan & Deci, 2000). Further, social factors are theorized to trigger and maintain interest in a variety of PA contexts (Hidi, 2001).

Specifically, social environments that support autonomy, competence, and relatedness are associated with situational interest (Deci & Ryan, 2011). Therefore, creating a social environment that facilitates engagement in PA may be one motivational strategy deserving of more consideration for addressing low levels of PA across all segments of the population. Although previous studies have demonstrated a relationship between interest and PA (Chen, Darst, & Pangrazi, 1999; Sun et al., 2008; Ullrich-French et al., 2013), failure to include social factors in this work may be a major limitation. Consequently, the focus of this review is to explore social factors as potential sources of situational interest in PA settings.

The first section provides an overview of interest theory. It examines the conceptual framework of interest theory, definitions, types of interest and how they relate to each other. In the second section, developmental stages of interest are examined. In the third section, the linkage between social factors delineated from self-determination theory and situational interest are examined. The fourth section provides an overview of the measurement of situational interest and social factors. Finally, conclusions, limitations, and suggestions for future research are highlighted.

Overview of Interest Theory

Historical Background

Educators who seek to increase student engagement in PA have used variety of teaching methods and numerous motivational theories, one of them being interest theory. Interest theory dates back to the early 20th century when education theorists such as Dewey (1913) and his contemporaries argued that interest is the most important motivational factor in learning. Despite the need for investigation of the concept of interest, researchers mainly addressed behavioral issues in motivation. It was only in the 1970's that there was a shift from behaviorism to social

cognitive research in education. By then it had been realized that motivational issues were central to learning, but interest was not discussed in most existing theories. The need to address behavioral issues led to emergence of achievement goal theory and self-efficacy theory (Bandura, 1977; Dweck & Leggett, 1988; Duda & Nicholls, 1992). For about three decades, research has focused on behavioral rather than affective aspects of motivation. Hidi (1990) and her contemporaries proposed a motivational theory investigating interest that encompasses social factors, and integrates cognitive and affective factors. Interest theory was developed for examining how person-activity interaction impact motivation. According to Hidi (2001), interest is an essential factor that is central to mental functioning, and it strongly influences how individuals select and persist in processing certain types of information in preference to others. Evidence shows that individuals who are interested in a task, topic, or activity are more attentive, persist for longer time, and acquire more knowledge than those who are disinterested (Hidi, 2006). Prior to application in PA, interest theory was predominantly utilized in education research, examining students' motivational issues in reading, math, psychology, and texts, among other areas of study (Hidi & Anderson, 1992; Mitchell, 1993; Schraw, Flowerday, & Lehman, 2001).

Early examination of situational interest in PA began with research by Chen et al. (1999) who investigated the multidimensionality of sources of situational interest in physical education (PE). Later, researchers examined situational interest as it relates with PA, tasks, sources, gender, and personal interest (Chen et al., 1999; Chen & Darst, 2001; Chen, Darst, & Pangrazi, 2001; Sun et al., 2008). Chen and colleagues (1999) developed a conceptual framework for the study of PA interest based on research by Deci (1992) and Hidi (1990). Just like Hidi (1990) who argued for the inclusion of affective component in motivational theories, Deci (1992) considered social

factors as a critical part of interest and underscored the role of social factors in prompting and maintaining motivation. Apart from connecting situational interest to social factors, there has also been an attempt to connect it to intrinsic motivation. In recent works, scientists posit that motivation as a product of one's social environment is influenced by the degree to which an individual's basic needs are fulfilled or thwarted (Deci & Ryan, 2011).

Definition

Interest is a motivational state that results from personal-environmental interactions (Chen et al., 2001). Schiefele (1991) proposes that interest is a content-specific construct that relates to a task or PA. For instance, a student enrolled in a soccer course may be interested in heel pass, but be uninterested in juggling. Notwithstanding, scientists argue that interest may be associated with prior experience (Chen et al., 2001). That is, students who have had positive engagement in PA are likely to be interested in same activity at later date.

Researchers posit that the distinction between personal and situational interest is grounded in sources and the characteristics of each (Hidi & Renninger, 2006). Situational interest is spontaneous, momentary, and environmentally initiated, while personal interest is less spontaneous, anchored on personal value, and internally motivated. Situational interest is the appealing effect of characteristics in an activity that generates responses from an individual during person–activity interaction (Linnenbrink-Garcia, Patall, & Messersmith, 2013; Renninger & Hidi, 2011). Personal interest results from experience and knowledge (Chen & Darst, 2001). Personal and situational interest have been of primary focus for researchers to date. Scientists have suggested that situational interest often precedes and enables the development of personal interest (Hidi & Renninger, 2006). To that end, interest development is hypothesized as a

sequence that starts with triggered situational interest, before proceeding to maintained situational interest, emerging personal interest, and finally to well-developed personal interest

Types of Interest

Personal Interest. Personal interest is an individual's psychological disposition associated with preference of one activity over others (Hidi & Harackiewicz, 2000; Schiefele, 2009). It is a relatively stable type of interest that resides within the individual and creates a deep personal connection with the task. Some investigations have established that personal interest is specific to persons and is tied to tasks (Sun et al., 2008). More so, personal interest is a relatively enduring predisposition to reengage with specific content in a specific environment (Hidi & Renninger, 2006). Predisposition is the concept that makes a student interested in PA and drives an individual to look for opportunities to engage in an activity of interest. For example, college students enrolled in a tennis course may already have interest or even engaged in tennis before enrolling in the course. Some students may also come to tennis class not interested in tennis, but may be interested in other types of PA. Personal interest is a relatively stable motivational orientation related to increased knowledge, value, and positive feelings (Renninger, 2000). As young people develop, they acquire more knowledge and generate values that can shift their interest. Likewise, some activities that might have been interesting during childhood and adolescence may no longer be interesting as they transition into young adulthood. At the same time, value systems have been known to affect PA interest.

In PE, personal interest functions on knowledge and skills students acquire in their learning environment (Chen & Darst, 2001). It should, however, be noted that personal interest is an internal characteristic that is applied in a supportive environment, with support systems encompassing peers and teachers. Other than the appealing effect of subject content, teaching

methods that encourage collaborative activities also impact development of interest (Linnenbrink-Garcia et al. 2013). Researchers also contend that personal interest has both cognitive and affective qualities (Schraw & Lehman, 2001). Unlike situational interest, personal interest cannot be easily manipulated (Renninger, Hidi, & Krapp, 2014). A sequence of learning experiences over time is more likely to shape personal interest than a single learning episode.

Some scholars have reported that personal interest is either latent or actualized (Schiefele, 2009). Latent personal interest is an intrinsic motivation within an individual that makes the person to be cognitively engaged with a task. Similarly, it leads to a long-term alignment towards a task. Latent interest produces the feeling component of interest. Further, it makes individuals attach emotions and value to tasks. Notwithstanding, actualized interest is a motivational state that is very specific to a topic and it determines engagement in PA. Students with elevated levels of actualized interest tend to seek challenging tasks, whereas those with low levels tend to avoid difficult tasks (Schiefele, 1991).

Situational Interest. Situational interest is a temporary type of interest prompted by the appealing effect of an activity (Chen, et al., 2001; Linnenbrink-Garcia, et al., 2013; Sun et al., 2008). It is a form of interest that is experienced when person-activity interaction generates feelings of novelty, challenge, attention demand, instant enjoyment, and intention to explore further. Unfortunately, the temporary nature of situational interest makes it very difficult to sustain, especially by teachers. In some instances, students' situational interest might disappear shortly after it is acquired. For example, the first tennis class meeting might be appealing to students, but after two or three lessons, their level of interest may dwindle. Some researchers have suggested that continued support of factors that elicit situational interest might help to maintain situational interest (Hidi & Renninger, 2006). For that matter, interventional strategies

such as teaching strategies that are appealing to students, offering challenge, establishing conditions that make PA enjoyable, and teaching additional content or skills, may increase students' interest.

Using Deci's (1992) work as a foundation, Chen and colleagues (1999) applied the five sources of situational interest in the PA domain, specifically in physical education classes. Novelty is the gap between the information that is known and what is not known (Chen & Darst, 2001). Further, it is the feeling that is aroused by something new or unusual (Dohn, 2011). Interest is dynamic and therefore individuals always desire to learn and discover newer information and ways of doing things. Students tend to lose interest in PA whenever they feel like there is nothing new they are learning. Repetitive tasks tend to lower situational interest (Shen, McCaughy, Martin, & Dillion, 2006). Studies have also shown that novelty is central to students' situational interest in PE classes (Sun et al., 2008). However, it should be noted that novel stimuli do not continue being functional once they have been in place for a while (Bergin, 1999).

Challenge is the level of difficulty in comparison to a person's ability that can motivate them to engage in PA. Challenge entails making the task a little difficult for the student. But precaution should be taken so that the task is not too difficult to the student. Tasks perceived to be too complicated or hard as they relate to individual ability may thwart interest (Chen & Darst, 2001).

Exploration intention is the desire to be given opportunities for engagement and advancement of acquired PA skills. Further, it is the learning aspects that drive the learner to search and discover (Sun et al, 2008). Mitchell (1993) suggest that exploration intention is a psychological aspect that requires cognitive stimulation, and it operates within the person's

mental disposition. In other words, it is stimulated by activities that involve concentrated cognition and mental energy. To that effect, Sun (2012) shows how the cognitive nature of PA, such as exergaming, is associated with increased situational interest. At least one study has shown linkage between exploration intention and enjoyment among students (Chen et al., 2001). Exploration is important especially to young children who are still learning new activities. Older students may also desire to explore new skills, before deciding what is of interest to them.

A social environment that supports exploration intention is associated with instant enjoyment (Chen & Darst, 2001). Instant enjoyment is the pleasure derived from PA (Sun et al., 2008). From literature, instant enjoyment and exploration intention are closely interrelated (Subramaniam, 2010). Research shows that instant enjoyment helps trigger and maintain situational interest (Chen et al, 2001). Also, students accorded chances to explore tend to instantly enjoy participation in PA (Chen et al., 1999).

Lastly, attention demand is mental energy and concentrated cognition required for learning an activity (Sun et al., 2008). It emerges from the interactive process between people with the environment. When students explore PA, it invokes demand for attention, suggesting that there is a linkage between intention to explore and demand for attention. Also, attention demand serves as the basis for development of instant enjoyment. Tasks that combine affective and cognitive component may impact students' attention (Chen & Darst, 2001). For example, in exergaming, sources of situational interest that are functional are attention demand and instant enjoyment (Sun, 2012).

Numerous studies have investigated the sources of situational interest. Chen et al. (1999) conducted a study using multisampling design to examine sources of situational interest in PE. This initial study revealed seven sources: novelty, challenge, exploration intention, desire

arousal, time alteration, attention demand, and sense of delight. A follow-up study revealed five sources of situational interest, by excluding time alteration and desire arousal (Chen et al., 1999). Research undertaken to validate previous studies confirmed five sources of situational interest among elementary (Chen et al., 1999, 2001) and middle school children (Sun et al., 2008). In addition, Chen et al. (1999, 2001) discovered that the highest correlation is between instant-enjoyment and situational interest, which suggests that instant enjoyment may mediate the relationships between sources of situational interest and total situational interest.

A recent research study by Sun et al. (2008) indicates that all the five sources are significantly related to situational interest. Nonetheless, this was in slight contrast to Chen et al. (2001), who only found a strong correlation between instant enjoyment and situational interest. Other scientists have argued that the differences observed in the relationship between situational interest and total interest may reflect age differences among students (Chen et al., 2001; Chen & Darst, 2002). For example, students at higher grade levels may be attracted to PA that provides for novelty and exploration intention, and is perceived to be valuable (Chen, 1996), whereas elementary children may be attracted to PA that is enjoyable.

Finally, it seems there is relationship between task design, grade level, and situational interest. While examining task design with middle and high students, Chen and Darst (2013) revealed that 9th graders reported lower situational interest than 7th graders. The same study found that students' level of situational interest was mediated with task design. As suggested by Chen (1996), perceived situational interest could be attributed to the value attached to PA, especially as individuals increase in age and knowledge. In a recent research study with elementary children, Sun (2013) reported that, among the sources of situational interest, exploration and challenge declined over time during an instructional unit. Seemingly, students

did not have enough opportunities for exploration and/or lack multiple challenges that could help sustain situational interest.

In summary, literature shows that there are five personal sources (personal) of situational interest and they operate in three categories. Novelty and challenge are in the activity category, exploration intention and instant enjoyment are in cognitive category, and attention demand is in the interactive experience category. The question that is yet to be discussed, is the transition from situational interest to personal interest.

Developmental Stages of Interest

Scientists have postulated that situational interest precedes and enables the development of personal interest (Hidi & Renninger, 2006; Krapp, 1999; Renninger, 1992). Further, interest development has been hypothesized as being a four-phase process that follows a sequence: triggered-situational interest; maintained-situational interest; emerging-personal interest; and well-developed personal interest (Hidi & Renninger, 2006). Each of the sub-category is considered distinct from others. Individuals follow a sequence in acquisition of interest, beginning with triggered-situational interest. Those who go along the continuum can reach the epic by attaining well-developed personal interest. The initial triggering and maintenance phases are associated with situational interest, while emerging and well-developed phases are grounded in personal interest (Hidi & Renninger, 2006).

Triggered situational interest. Situational interest exists in the forms of triggered and maintained facets (Chen et al., 1999). Triggered phase is the first stage of development of situational interest and is characterized by temporary interest in PA that may persist or wither, depending on social support structures. Triggered and maintained situational interests have also been hypothesized as ‘catching’ and ‘holding’ situational interests (Mitchell, 1993; Chen, 1996).

Hidi and Baird (1986) argued that interest is a continuum that is made of two facets, ‘triggering conditions’ and conditions that ensure continuation of interest. Triggered situational interest is characterized by catching factors that easily stimulate students to engage in a particular activity. According to Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008), catching factors are related to arousal, attention and affect. Further, catching factors that stimulate situational interest include group work (Garn, Cothran, & Jenkins, 2011) and cognitive oriented tasks. For example, in PA class, the instructor needs to design tasks that strike students’ interest at the onset of class (triggered situational interest), but also establish social support structures that will sustain (maintain or hold) interest in learning. The aim of triggering facets is to stimulate students’ interest, yet maintaining facet aims at identifying variables that can empower them.

In short, triggered situational interest occurs when environmental factors catch the attention of an individual and produce positive feelings (Mitchell, 1993). Even more, triggered situational interest is typically externally supported. Learning activities that involve group work, challenges, and novelty arouses interest (Mitchell, 1993). In many cases, the amount of challenge vis-à-vis ability, novelty, and cognitive demand determine the extent to which individuals make personal connections and invest their energy into the task. Triggered situational interest typically occurs over a short duration and may or may not lead to further engagement. Therefore, a student at the level of triggered situational interest would derive enjoyment and meaning from the content or task (Linnenbrink-Garcia et al., 2013). Such a student would not seek out for other opportunities to learn about the task other than what is addressed in a structured learning environment. However, when initial situational interest triggers further engagement, the student may move in to the maintained situational interest phase.

Maintained situational interest. Maintained situational interest ensues when the social environment supports involvement and enjoyment of the task itself (Schiefele, 2009). Moreover, it is characterized by increased attention and persistence in PA over a given time, and may reoccur over and over (Renninger & Hidi, 2002). Learning activities and tasks that are student-centered and involve group activities have been proved to support maintained situational interest (Mitchell, 1993). To be interested implies having a subjective feeling for the topic (affect). Therefore, one of the most prominent features of maintained situational interest is the reference to the person's values and feelings. Accordingly, both the feelings and value are intrinsic in nature.

Developing feeling or value for any task requires having some knowledge about the activity in question (cognition) and interacting with it. Thus, scientists postulate that an individual's decision to participate or disengage in an activity depends on past knowledge or appealing effect of the activity (Zhu et al., 2009). Further, Hidi and Renninger (2006), posit that interest theory encompasses cognitive and affective domains, particularly at the triggered stage. Maintained (holding) situational interest is upheld by tasks at which students can explore (Sun, 2013) and are meaningful to them (Chen, 1996). Social environments that augment basic needs are known to establish situational interest (Deci, 1992). Studies show that perceived meaningful and valuable PA relates to maintained situational interest (Garn et al., 2011; Krapp, 2002). For instance, students attach value to PA when they begin to attach health benefits to exercise. Nevertheless, maintenance of situational interest may require PA teachers to explain the importance of PA to students, including the health benefits, because subject content that is meaningful and relevant maintains interest (Mitchell, 1993).

Even though it is hypothesized that supportive social environment may impact transition from triggered to maintained situational interest (Hidi & Renninger, 2006), other studies show that situational interest may also decline. For instance, Sun et al. (2012) point to decline in situational interest in exergaming activities among elementary school at the beginning and end of instruction period. A follow-up study specifically exposed a greater drop in challenge, novelty, and exploration intention (Sun, 2013), raising questions on the sustainability of situational interest in exergaming. Contextual characteristics seem to produce a willingness to reengage and persist in activities within the environment. It seems the maintained situational interest is typically, but not exclusively, supported by external factors (Hidi & Renninger, 2006). Much like triggered situational interest, the maintained phase may or may not generate the development of personal interest. However, both triggered and maintained situational interest are related to feelings. Linnenbrink-Garcia et al. (2013) have linked the feelings attached to triggered situational interest with the type of instruction, while emerging situational interest has been connected to the content itself. Consequently, triggered interest is a reaction to the way the content is delivered and that is why it is attached to feelings. Maintained situational interest is an emotional reaction to the content or task itself and thus relates to the perceived values attached to the task.

Emerging personal interest. Emerging personal interest represents the transitional phase where individuals shift from external to internally supported interest. Even more, it is a psychological state of interest that marks the beginning phases of a relatively enduring predisposition to seek repeated reengagement with a subject content over time (Renninger & Hidi, 2006). Students generally become more resourceful and find ways to overcome external barriers (Lipstein & Renninger, 2006). Social support is important for emerging-situational

interest. Individuals in emerging-interest phase experience positive feelings, attach value to the activity, and possess stored knowledge (Hidi & Renninger, 2006). Moreover, interest becomes a more stable construct that is reliant on stored knowledge (Huang & Gao, 2013). Emerging personal interest has also been associated with personal initiation, curiosity, and self-regulation while engaging in a task (Renninger & Hidi, 2002). Accordingly, perceived attention placed on the content and task by different students makes the levels of interest to differ. Thus, personal interest is not uniform across activities and individuals. Because personal interest is still at an early stage of development, individuals in this phase typically seek out support as a strategy to overcome barriers (Renninger & Hidi, 2002).

Well-developed personal interest. The last phase (a well-developed personal interest) denotes a psychological state of interest, and a relatively enduring predisposition to reengage with subject content over time (Renninger & Hidi, 2006). A well-developed personal interest is the most stable form of interest that drives an individual to consistently reengage with a task. At this final phase, students are self-generated and they do not need external support to engage in the task. Creativity, self-regulation, and efficient problem-solving skills are some characteristics associated with this phase (Hidi & Renninger, 2006). A great deal of stored knowledge, value, and positive feelings endure with individuals who reach the well-developed phase of interest. Even though individuals at the final phase may still benefit from social support, it is less important since barriers can often be dealt with personally (Renninger, 2000). Finally, while triggered and maintained situational interest concentrate on attention and positive feelings, emerging and well-developed personal interest are concerned with stored knowledge and long-term engagement with the task.

Even though it is hypothesized that there is relationship between situational and personal interest (Chen et al., 2001; Hidi & Renninger, 2006), available literature is conflicting. For instance, Chen and Darst (2002) found that constant environmental support of situational interest may result in developing personal interest, especially among students who lack personal interest in PA (Chen & Darst, 2002). Some studies have revealed moderate correlation between personal and situational interest among middle school children in dance class (Shen et al., 2003). Research examining personal and situational interest with the Progressive Aerobic Cardiovascular Endurance Run (PACER) task revealed a positive correlation between personal-interest with all sources of situational interest, except challenge (Zhu et al., 2014). On the other hand, at least one study did not find a connection between personal interest with situational interest with tasks that are more physical and less cognitive (Chen & Darst, 2001).

Despite identification of five personal sources (Chen et al, 1999, 2001; Sun et al., 2008), other researchers argue that social factors (environmental sources) are valuable determinants of situational interest (Deci, 1992; Dohn, 2011; Dohn, Madsen, & Malte, 2009; Frenzel, Goetz, Pekrun, & Watt, 2010; Hulleman & Harackiewicz, 2009; Linnenbrink-Garcia et al., 2013; Mitchell, 1993). To unravel the complexity of interest, scientists have articulated the connection between situational interest and intrinsic motivation (Deci, 1992). Krapp (2002) suggests that intrinsic motivation is directly related to situational interest. This hypothesized connection directly influenced Deci's (1992) proposal for a multidimensional concept of situational interest, which suggests that the mental disposition, nature of activity, and the social environment impact the emergence of situational interest. In summary, situational interest operates in three dimensions: the person, the activity, and the social context.

Person-activity interaction is mainly in the form of hands-on and audiovisual technologies such as videos (Krapp, 2002). An example of a hands-on task is when students develop interest when they are actively engaged in tennis. This could be in the form of teachers describing the tasks to students and letting them perform on their own, but under supervision. Teachers may also ask students to watch videos before engaging in target tasks. Whether hands-on or watching videos, task design has an impact on situational interest. For example, a study focusing on task design found that in comparison to basketball chest-pass task (physical), students rated videotaped basketball pass-shoot drill (cognitive) higher in every source of situational interest (Chen & Darst, 2001). Moreover, other researchers have argued that situation-specific sources that prompt interest include the nature of the task, instructional strategies, and social relations (Krapp, 2002). Apart from igniting situational interest, socially supportive environments may also uphold interest (Chen & Darst, 2001; Garn et al., 2011).

Social Factors and Situational Interest

From a developmental perspective, the five sources proposed by Chen et al., (1999) only focus on personal factors thereby excluding social determinants of interest development. Recently there have been claims that researchers studying PA motivation should keep in mind the fact that students are part of a broader social environment, and this influences their motivation contexts (Bergin, 1999; Hassandra, Goudas, & Chroni, 2003). For instance, Deci and Ryan (2011) demonstrate how social factors influence motivation by impacting individuals' perception of competence, autonomy, and relatedness (i.e., needs) during the person-activity interaction. Generally, situational interest is evoked and upheld by social environment that is characterized by active learning, meaningful content, high cognitive learning, enjoyable PA, and student empowerment (Subramaniam, 2010). Further, evidence shows association between

learning environment that supports needs with interest and PA engagement (Vlachopoulos & Michailidou, 2006).

Deci's (1992) work drawing a link between interest and intrinsic motivation had a lot of influence on Chen and colleagues (1999) as they developed their measure to assess situational interest. On several occasions, Deci (1992) describes the importance of the social factors in the development of interest. Deci and Ryan (1985) state that environmental factors that create genuine interpersonal involvement with friends, peers, teachers, and/or parents help trigger and maintain interest. Deci (1992) also suggests that interest is often absent or disrupted during activities that lack interpersonal connections. Furthermore, Ryan and Deci (2000, p.70) argue that motivation is "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn." Thus, there appears to be a theoretical justification for exploring social factors in conjunction with novelty, challenge, exploration intention, instant enjoyment, and attention demand.

Scientists argue that contextual social factors may be present on regular basis in a specific context but not certainly in another (Linnenbrink-Garcia et al., 2013). As an illustration, an engaging instructor may inspire a student's motivation toward tennis but not towards other courses. More so, a student may be interested in a tennis serving skill, and yet be unmotivated in other skills, such as backhand. As stated earlier, situational social factors are existent at a given point in time (for example, the instructor allowing students to choose partners during practice session). Evidence shows that a class environment that encourages interpersonal interactions and group activities augments situational interest (Dohn et al., 2009; Palmer, 2009). Linnenbrink-Garcia et al., (2013) contend that friendly and approachable teachers increase students' short-term positive feelings. These feelings trigger situational interest, independent of the learning

content. Furthermore, group activities that promote deeper levels of personal involvement and interaction are likely to help maintain situational interest (Garn et al., 2011).

Despite scientists pointing to the existence of relationships between social factors and PA (Weiss & Smith, 2002), interest-based studies have concentrated on personal sources of situational interest (Chen & Darst, 2002; Sun et al., 2009; Shen et al., 2003; Zhu et al., 2009), at the exclusion of social factors. Identifying pertinent social factors with apparent links to exercise settings can potentially create a more comprehensive model of situational interest. Developing a more comprehensive model of situational interest, in turn, leads to more strategies that help trigger and maintain situational interest. Incorporating social factors is essential, especially for individuals who are just beginning a PA regime. Since it is suggested that there is a relationship between situational interest and intrinsic motivation (Deci, 1992), it is imperative to briefly explain self-determination theory (SDT) and its basic needs micro-theory, with the view of establishing how they relate with situational interest.

Self-Determination Theory

Self-determination is a theory of human motivation and personality that focuses on sources of motivation, the role of motivation in cognitive and social development, and individual difference (Ryan & Deci, 2007). Proponents of SDT contend that human beings engage in activities for either external or internal rewards. Whereas some people are driven by external rewards, such as good grades, others engage in activities for internal rewards (for example, satisfaction gained from learning a new skill). To this end, Deci and Ryan (2011) identified amotivation, extrinsic, and intrinsic as the three types of motivation. Thus, motivation is a continuum that encompasses amotivation, extrinsic, and intrinsic motivation (Ryan & Deci, 2007). At the lowest level is amotivation, characterized by lack of intention to act and absence of

motivation. Extrinsic motivation is when an individual's aim of action is influenced by separable consequences, such as reward and punishment, and it embraces several regulatory styles such as external regulation, introjected regulation, identified regulation and integrated regulation (Gao, Podlog, & Huang, 2013). External regulation, being the least autonomous form of extrinsic motivation, is being motivated by external rewards or to avoid punishments. For instance, a student who engages in PA to get good grades is externally regulated. Introjected regulation is a form of extrinsic motivation that has been partially internalized. At a level of introjected regulation behaviors are performed to avoid guilt or out of feelings of obligation. Identified regulation has internal perceived locus of causality. It involves acceptance of behavior as personally important. Finally, integrated regulation is the most autonomous and self-determined form of extrinsic motivation. It is associated with positive experiences and volition, and when individuals function at a level of integrated regulation, the behavior has been integrated into their personal identity. However, unlike intrinsic motivation, integrated regulation behaviors are performed to attain a personally important outcome rather than for enjoyment and inherent interest.

Intrinsic motivation represents the highest and goal of self-determination, and it entails students engaging in an activity or behavior for its own sake and not for external contingencies. Students can engage in PA due to internal rewards, especially the resultant instant enjoyment and satisfaction (Sallis, Prochaska, Taylor, Hill, & Geraci, 1999). In brief, the definitive goal of SDT is to create supportive social conditions that can help individuals move along the continuum towards intrinsic motivation. Intrinsic motivation is the most autonomous form of motivation. It is argued that human beings are inherently active, intrinsically motivated, and develop naturally through an integrative process (Ryan & Deci, 2000). When intrinsically motivated, students are

self-regulated, have a feeling of volition, and engage in PA owing to interest, but not necessarily motivated by external rewards (Deci & Ryan, 1995). Students are intrinsically motivated to pursue interesting and enjoyable PA. Ryan and Deci (2000) posit that intrinsic motivation is the inherent tendency by human beings to seek out novelty and challenges, to explore, and to seek for enjoyment. Hypothetically, there is a close linkage between situational interest, personal interest, and intrinsic motivation, since empirical evidence points to novelty, challenge, and enjoyment as some of the sources of situational interest (Chen & Darst, 2001).

Situational Interest and Intrinsic Motivation.

Deci (1992) has suggested that social factors elicit and support self-determined motivation. Evidence also indicates there is a relationship between situational interest and intrinsic motivation (Ryan, Frederick, Lipes, Rubio, & Sheldon, 1997). Students' situational interest is not only affected by the content, but also by the teaching style. Teaching styles that allow for autonomy tend to increase and maintain situational interest. Subject content that is perceived to be enjoyable often facilitates internal drive and desire to continue being physically engaged (Frederick-Recascino & Schuster-Smith, 2003). At least one study has shown that students who are intrinsically motivated also experience enjoyment (Gao et al., 2013).

Other studies have shown that students' PA behaviors are positively associated with intrinsic motives such as fun, exploration demand and enjoyment (Ferrer-Caja & Weiss, 2000). A reciprocal relationship has been revealed between intrinsic motivation and activities that are deemed enjoyable and interesting (Ryan & Deci, 2000). When students are intrinsically motivated, they not only experience interest and enjoyment, but also exert effort and persistence (Deci & Ryan, 1985). Other than enjoyment, some college students appear to be intrinsically motivated by PA that offers challenge (Kilpatrick, Hebert, & Bartholomew, 2005). In contrast to

findings from other research, Ferrer-Caja and Weiss (2000) found that middle school students are intrinsically motivated by PA that elicits exploration intentions.

Scientists have also investigated how needs relates to intrinsic motivation. Cox, Smith, and Williams (2008) discovered that self-determined motivation mediates the relationship of needs with enjoyment. This argument supports self-determined motivation and the hypothesis that need satisfaction should directly relate to intrinsic motivation and other indices of well-being, such as enjoyment. More evidence points to a relationship between supportive social environments and intrinsic motivation (Gao et al., 2013; Richard et al., 1997). Proponents of SDT assert that the social environment must support autonomy, competence, and relatedness for individuals to be intrinsically motivated (Deci & Ryan, 2011). To this end, a mini-theory of basic needs was developed (Ryan & Deci, 2000), with the goal of exploring conditions that trigger and maintain intrinsic motivation.

Need-Supportive Environments

Human beings are naturally endowed with innate needs that become more integrated into a complex system of motivational control during the growth span (Krapp, 2005). According to SDT there are three needs that are universal: autonomy, competence, and relatedness. Fulfilment of the needs is necessary for continuous person-activity engagement (Ryan, 1985). In principle, needs are not only holistic, but are also persistent. Even though there are three needs, the system does not allow for distinction of the needs. In other words, the three needs must be met in order for an individual to be intrinsically motivated. Unlike biological needs which diminish once they are fulfilled, needs are ongoing vital nutrients for human flourishing (Deci & Ryan, 2011). Therefore, teachers who aspire to motivate students must establish a learning environment that fosters these needs. Accordingly, SDT has analyzed the effects of social factors in terms of their

significance to a person's feelings of competence, autonomy, and relatedness (Krapp, 2005; Ryan & Deci, 2000).

Social factors that support attainment of all the needs boost PA engagement, whereas contexts associated with need-thwarting are seen to be antagonistic (Deci & Ryan, 2011). The argument put forth is that motivation is influenced by the extent to which the social environment supports autonomy, competence, and relatedness. A social context that provides opportunities for students to satisfy their basic needs may lead to intrinsic motivation, while events that thwart these needs lead to amotivation. People's sense of volition, well-being and level of performance is enhanced or weakened by social factors (Deci & Ryan, 2008). Thus, needs are essential for prompting and regulating behavior. Autonomy support, structure (competence), and involvement (relatedness) are three aspects of the social environment that affect behavioral choices.

Autonomy support. First, autonomy is grounded in beliefs that individuals control their own behavior. In other words, autonomy occurs when an individual believes activities and behaviors are self-endorsed (Standage, Duda, & Ntoumanis, 2005). In PA contexts, this means that individuals desire to feel in control of her/his actions. Autonomy-supportive environments nurture students' needs, integrate values, and enhance individual interests (Reeve, Deci, & Ryan, 2004). Empirical studies on autonomy support focus on social and cultural impacts that serve as channels for teacher-autonomy support and the motivational strategies used by teachers. Even though students sometimes get autonomous support from friends, teachers that are tasked with the bigger responsibility of creating supportive learning environment. More so, studies have shown that students who learn in a social environment that allows them to self-endorse their own actions reported higher levels of situational interest (Schraw et al., 2001).

Scientists have proposed several autonomy-supportive ways that teachers motivate students: Nurture inner motivational resources; utilize informational, non-controlling language; present interesting, relevant, and enriched activities; explain the value for activities, and rationale for expected behavior; and acknowledge and accept students' expression of negative affect (Jang, Reeve, & Deci, 2010; Reeve et al., 2004). When teachers nurture inner motivational resources, they identify teaching strategies that are sensitive to students' preferred activities, sense of enjoyment, competencies, and levels of challenge (Reeve, 2006). In contrast, autonomy support is decreased with controlling instruction (Perlman & Karp, 2010). Students perceive controlling instruction when teachers use punishment or reprimand as a motivational technique, for example, telling them to either work harder or get an 'F' grade. It is argued that since fostering autonomous forms of motivation increases self-directed pursuit of school activities in the absence of external reinforcement, it is a prudent idea for teachers to prioritize autonomy support (Reeve, 2002). Approaches that encourage autonomy include students being allowed to freely choose playmates and tasks in PE classes (Deci & Ryan, 2013).

Research with high school students shows that an autonomy supportive environment positively predicts needs satisfaction and self-determined motivation (Standage, Duda, & Ntoumanis, 2006). Students having choices in PE classes are also more engaging than those who are not given opportunity to select preferred PA (Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009). Seemingly, the free-choice environment might satisfy students' needs. Students freely choose activities based on perceived enjoyment, competence, and opportunities to relate with their friends. Findings support SDT proposal that autonomy support serves to satisfy needs, apart from helping sustain motivation (Ryan & Deci, 2002). Perceived autonomous support is also

closely associated with intrinsic motivation and greater intention to exercise (Wilson & Rodgers, 2004).

Structure. Secondly, competence is when individuals believe that they are proficient enough to elicit desired results (Ferrer-Caja & Weiss, 2000). Further, it is the need for challenge and a feeling of effectiveness and self-confidence while interacting with the social environment, besides seeking opportunities to engage in PA and show individual capacities (Deci & Ryan, 2002). Evidence points to three ways that students assess their competence: comparing their performance to peers; using self-referenced criteria; and getting feedback (Niemic & Ryan, 2009). The principle idea is that students only engage and generally value activities which they feel they can understand and master. Provision of feedback has been found to be very impactful in boosting students' perceived competence (Cox et al., 2008), particularly in helping them improve their competence.

Competence supportive environments are defined by the teaching structure. Structure is described as the amount and clarity of information that teachers provide, educational outcomes and goals, and ways of effectively achieving learning objectives (Reeve, 2002). Lack of appropriate structure may lead to confusion, lack of clarity and meaningful learning, and misunderstanding which can adversely affect perceptions of competence. Skinner et al. (2008) postulates that structured teaching enhances competence, locus of control, and increased motivation. Teachers that design class structures that foster competence provide clear and predictable procedures, strong leadership, clear goals, challenge, skill-building, and feedback (Reeve et al., 2004). Perceived competence is associated with higher levels of needs support and intrinsic motivation (Standage et al., 2006).

A study with middle children revealed that a need-supportive environment positively influenced perceived competence, PA enjoyment, and engagement (Cox & Williams, 2008). A well-structured class is associated with perceived competence (especially teachers setting realistic goals and challenges), apart from mediating the effect of teaching style on intrinsic motivation (Ferrer-Caja & Weiss, 2000). While examining students' engagement in after-school PA programs, Carroll and Loumidis (2001) found that those students who perceive themselves to be more competent in PE tend to participate more in PA than those who perceive themselves to be less competent. Bearing in mind that competence is partially determined by structure, it is imperative to discuss how competence relates to task design.

Researchers suggest that for meaningful learning to occur, tasks should be structured to incorporate the social, physical, and cognitive domains (Chen et al., 2001; Subramaniam, 2010; Zhu et al., 2009). Therefore, the best pedagogical approaches are those that create a learning environment that encourages students to explore, overcome challenges, and enjoy PA. Basically, tasks differ in terms of their motivational properties, with some tasks perceived to be more enjoyable than others. For example, tennis players may be more motivated to practice volleys than going for long runs. However, individual preferences and environmental factors may also affect motivation towards a task (Zhu et al., 2009). Moreover, tasks may be designed in a way to target either the cognitive or physical domain. Interest that may arise is determined by the design and it is very specific to individuals.

Cognitive-oriented tasks mainly dwell on mental aspects, whereas physically-oriented tasks entail both mental and physical demands. Cognitive tasks entail students applying mental effort and knowledge as they engage in PA (Zhu et al., 2009). For instance, whereas watching a video game to learn a skill may be considered a cognitive task, practicing back-hand skill in

tennis is a physical task. Tasks that are designed cognitively often make students to apply cognitive skills to stay engaged and to persist, irrespective of the level of difficulty (Zhu et al., 2009). In addition, cognitive design focuses on an individual's attitudes, thoughts, attention, evaluations and beliefs, while physical design relates to a person's perceived competence towards PA (Zhu, Chen, & Parrott, 2014). Consequently, researchers have articulated the importance of the cognitive aspect especially in establishing mind-body coordination which is necessary for motor learning and physical performance (Chen & Darst, 2001).

Effective learning in PA is partially caused by interplay between the cognitive component and individual ability to meet physical demands (Subramaniam, 2010). Therefore, instructors must understand the interplay between cognitive and affective demands to determine the task and depth of subject content. Based on literature, task design can be equated to competence support which resonates in the ways that teachers structure the learning environment. The way instructors and teachers structure the learning tasks has influence on the development of situational interest. For instance, recent research depicts situational interest as a construct that is heavily influenced by task design (Renninger, Hidi, & Krapp, 2014). Tasks that are interesting are associated with higher level of engagement than tasks with low situational interest (Chen & Darst, 2001). As discussed earlier, situational interest is specific to teaching design, and therefore students' motivational levels are specific to the person and task. To clarify, each student is individually motivated by tasks. Research has shown that task designs that incorporate cognitive and affective domains are more appealing to students, which promotes situational interest and PA engagement (Chen, Shen, Scrabis, & Tolley, 2002).

Involvement. Relatedness is the desire to feel connected and be accepted by significant others (Ryan & Deci, 2000). It is the development and maintenance of close personal

relationships with friends and significant others, including teachers and coaches. Features of relatedness support, also referred to as involvement, include contexts in which feeling of worth, love, respect, connection, understanding, and belonging occur (Ryan, Patrick, Deci, & Williams, 2008). In a PA setting, relatedness support aims at socially connecting a student to peers and teachers. Close relation and interaction with peers and teachers helps students make greater meaning out of PA. Relatedness with teachers is expressed when teachers show understanding, listen to students, provide feedback, show interest in the learning process, and establish a social environment that is supportive (Cox et al., 2008; Standage, Duda, & Ntoumanis, 2003).

Teachers also support relatedness by portraying warmth and openness; investing personal resources such as time and energy; being physically close to students; and personally, knowing their students (Reeve et al., 2004). In addition, teachers may be involved and have rapport with students. Even though support and interactions with other students is also valuable, research demonstrates that students' engagement is more sensitive to teacher motivational style (Reeve et al., 2004). Perceptions of a positive relationship between students with their teachers and classmates motivates them to be more engaged (Skinner et al., 2008).

In contrast, the absence of relatedness is associated with feelings of insecurity and boredom (Ntoumanis, 2001). Lack of relatedness support may lead to withdrawal from activities. As much as SDT proponents theorize that fulfilment of all the needs is a condition for intrinsic motivation, other researchers have found that teacher support is more important for students' feeling of relatedness, than it is for competence and autonomy (Cox & Williams, 2008). Also, relatedness-support alone is not a strong predictor of PA, but instead seems only to be influential when considered in conjunction with the other basic needs. Other researchers have found that relatedness support is more important to students that do not participate in after school PA

programs than those that do (Shen, 2014). This may be attributed to the fact that non-participants in after school programs may not have any other opportunity to interact and learn from the teachers and friends.

From the literature, there appear to be relationships among personal sources and total situational interest, PA engagement, and environmental sources as operationalized in the social factors that support basic needs. Researchers have developed and validated measurement instruments to test for personal sources and total situational interest. Social factors assessing needs support have also been examined using various instruments. The examination of personal and environmental sources of situational interest is a central concern in this review. At this juncture, it is imperative to examine instruments used in measurement of personal sources, and environmental sources (autonomy, competence, and relatedness support) of situational interest.

Construct Measurement

Situational interest. Situational interest is generated by the specific features of the environment or task (Chen et al., 1999; Chen et al., 2001; Renninger & Hidi, 2006). Chen et al. (1999) developed and validated a 24-item instrument exploring five dimensions as previously noted. Exploratory and confirmatory factor analysis identified and confirmed four items per dimension and Cronbach's alpha estimates ranged from .78 to .89. A 5-point likert scale ranging from strongly disagree (1) to strongly agree (5) is used with the 24 items.

Chen et al. (2001) undertook a study to measure contribution of each source of situational interest to situational interest. It was revealed that all the five sources contribute to total interest, with instant enjoyment typically making the largest contribution in terms of magnitude (i.e., factor loading) and effect (R^2) with adolescents enrolled in PE. While investigating elementary school students, Sun et al. (2008) validated Chen's scale with two independent samples. Results

from the confirmatory factor analyses point to an excellent fit between the theorized dimensions and both data sets. The findings support the idea that the five dimensions of situational interest can be reproduced in both elementary and middle school students. In addition, correlation studies indicate moderate to strong correlations between total situational interest with all the sources ($r = .34$ to $.79$). Like Chen et al. (2001) findings, the strongest predictor is instant enjoyment and the weakest predictor of total situational interest is challenge.

Autonomy, competence, and relatedness support. According to Deci and Ryan (1995), individuals perceive autonomy support in terms of the extent to which people in positions of authority create and uphold social environments that support attainment of autonomous needs. Autonomy support is often measured with a modified version of Learning Climate Questionnaire (LCQ) that was constructed by Williams and Deci (1996). Studies with organic chemistry, medicine, and PE students support internal validity of LCQ (Black & Deci, 2000; Williams, & Deci, 1996; Hagger, Chatzisarantis, & Biddle, 2002; Williams, Saizow, Ross, & Deci, 1997). LCQ was created to assess perceptions of the autonomy supportiveness of course instructors. Williams and Deci (1996) reconstituted six-item version questionnaire on 5-point likert scale. The premise was to develop a shorter version that could be incorporated in studies which assess many other variables, apart from autonomy support, but still maintain validity and reliability. Researchers have argued that PA-based research ought to be interpreted in the context in which it is performed (Hidi, 2006). To that end, Standage et al. (2006) modified some items to target PE, which produced a Cronbach alpha estimate of .85. An example item is, “the PE teacher tries to understand how we see things before suggesting latest ways to do things.” Standage and colleagues (2006) revealed that autonomous-supportive environment is a predictor of all three needs satisfactions.

Competence support is often measured using four items devised by Standage et al. (2005). For example, this scale was used in a study with 950 secondary students enrolled in PE class in England (grades 7-10; M age 12.14; *SD* = .91; range 11-14 years). Cronbach's alpha coefficient ($\alpha = .84$) indicates the scale has internal reliability. Items begin with a stem: 'In this PE class...' and sample items are: 'the PE teacher makes us feel like we are good at PE', 'the PE teacher helps us to improve', and 'we feel that the PE teacher likes us to do well.'

Finally, relatedness support is often measured with the Need for Relatedness Scale (Richer & Vallerand, 1998; Standage et al., 2005). Initially, this scale was designed to measure work place relatedness, but was modified to target PE (Standage et al., 2005). The stem was modified to read, 'In this PE class...' Sample items are: 'the PE teacher encourages us to work together in practice', 'the PE teacher supports us', and 'the PE teacher has respect for us.' The scale has demonstrated internal consistency in studies by Richer and Vallerand (1998) (Cronbach alpha = .91) and Standage et al., (2005) (Cronbach alpha = .88). While examining PE students, Standage et al. (2005) found that all three need-supports had direct positive effect on intrinsic motivation.

Conclusions, Implications, and Directions for Future Research

This review explored social factors as sources of situational interest. Discussion was centered on definitions, concept, categories of interest, and relationship with intrinsic motivation. Literature also addressed situational interest findings, especially as they relate to intrinsic motivation, PA, personal interest, task design, and age. The first conclusion from this literature synthesis is that interest emerges from the interaction between the person and the activity in a specific social environment (Hidi, 1990, 2001, Chen et al., 1999). Accordingly, personal interest is permanent, inherent, and is influenced by past knowledge and experiences (Chen & Darst,

2001, Chen et al., 2001; Sun et al., 2009). Yet, situational interest is a temporary variable that is influenced by social environment, varies from individual to individual, declines with age and grade level, and is tied to a task (Renninger & Hidi, 2011). There is conflicting information about relationship between personal and situational interest. Some studies hypothesize that situational interest precedes personal interest (Chen & Darst, 2002; Shen et al., 2003; Zhu et al., 2014). Other findings do not show relationship between personal and situational interest (Chen & Darst, 2001).

A second conclusion drawn from the literature supports the multidimensionality of situational interest, with evidence pointing to five personal sources: novelty, instant enjoyment, challenge, attention demand, and exploration intention (Chen et al., 1999, 2001). Generally, the consensus is that the strongest association is between instant enjoyment and total situational interest. Instant enjoyment also mediates the relationship between personal sources with total situational interest. Novelty and instant enjoyment are prevalent across triggered and maintained situational interest. Yet, challenge, attention demand, and intention to explore are predominant with maintained situational interest. Challenge is the only source whose relationship with total situational interest is insignificant. Based on this outcome, teachers should be careful not to introduce tasks that are perceived to be too complex or difficult in relation to students' abilities. Difficult tasks may thwart situational interest. This literature points to the need for teachers to devise teaching strategies that incorporate new ideas that prompt instant enjoyment.

A third conclusion is that relationships among social factors as environmental sources, intrinsic motivation, and situational interest are currently unresolved and need further investigation. Literature supports the notion that social factors as environmental sources are associated with situational interest, and mediate intrinsic motivation (Chen & Darst, 2001; Garn

et al., 2011; Gao et al., 2013; Schraw et al., 2001). Unfortunately, research on these relationships is scarce. Future research should examine the relationships between environmental sources and situational interest in PA settings and explore how they interact to affect motivation. From the existing literature, it is sensible to conclude that social factors contribute to intrinsic motivation and situational interest.

Teaching methods that support autonomy are likely to trigger and maintain situational interest (Standage et al., 2004). Among personal sources, one that comes out distinctively is enjoyment. Enjoyment is the goal of intrinsic motivation, besides being a source of situational interest. Lastly, situational interest is sustained by teachers who support autonomy, relatedness, and competence. Situational interest and intrinsic motivation are upheld by needs-support, especially relatedness and autonomy, and thwarted by unstructured learning environment (Deci, 1992). Thus, there appears to be theoretical justification for examining social factors as they relate to situational interest.

Situational interest is related to intrinsic motivation and the argument can be made that it should also be associated with more self-regulated levels of motivation. More self-determined levels of motivation lead to long term adoption of target behaviors such as choosing to be physically active. With that established, structuring instructional environments that will trigger situational interest and maintain that interest, ultimately with the goal of promoting personal interest in a target behavior such as PA, then becomes a key area of research. It is also clear that satisfaction of the needs leads to more autonomous forms motivation to engage in an activity. The argument that needs satisfaction could promote situational interest is put forth in this review. This review contributes to the literature through the application of interest theory in PA settings by exploring the notion of that supportive social factors, in addition to satisfying basic needs

could also be sources of situational interest (see Figure 1).

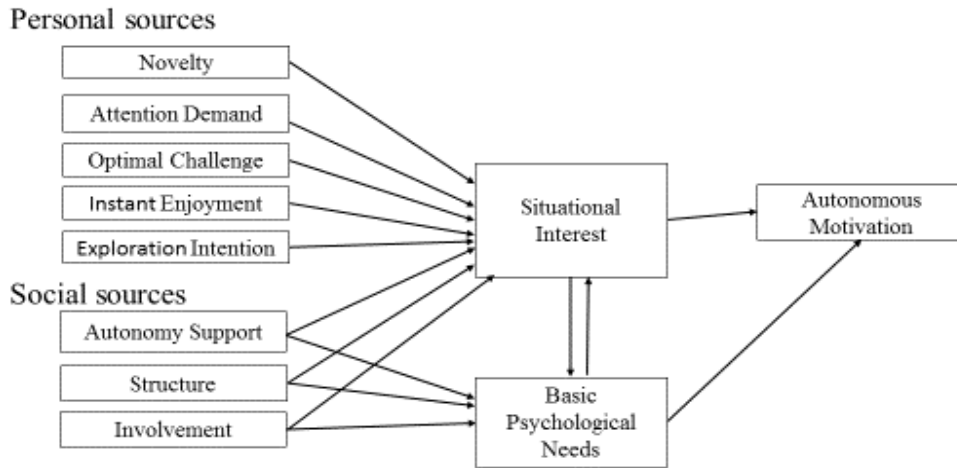


Figure1. Sources of situational interest.

The theoretical basis for the interrelationships among situational interest, need-supportive environments, and autonomous motivation have been established, but there is a need to test these relationships presented in figure one. Research designed to test the hypotheses embedded in this theoretical model has the potential to provide insight into how physical education teachers and other physical activity practitioners can structure learning environments to promote autonomous motivation.

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APPENDIX B: PERSONAL INTEREST QUESTIONNAIRE (MIDDLE SCHOOL)

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
1. When I do PE, I sometimes get totally absorbed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Because PE is fun, I wouldn't want to give it up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. PE is important to me personally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX C: SITUATIONAL INTEREST QUESTIONNAIRE

Think of the activity you just completed while responding to this questionnaire

	Very Untrue	Untrue	Neutral	True	Very true
1. This activity is exciting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. It is a complex activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. This activity is complicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. My attention was high	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I like to find out more about how to do it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. This activity is new to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. This activity is fresh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I want to analyze it or have a grasp on it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. This activity is interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. It is hard for me to do this activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The activity inspires me to participate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. This activity is appealing to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. It is fun for me to try this activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I like to inquire into details of how to do it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. This is an exceptional activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I was very attentive all the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I was focused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. The activity looks fun to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. This is an interesting activity for me to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I want to discover all the tricks of this activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. This is a new-fashioned activity for me to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. This activity is a demanding task	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. It is an enjoyable activity to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I was concentrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX D: BASIC PSYCHOLOGICAL NEEDS-SUPPORT QUESTIONNAIRE

Think of the activity you just completed while responding to this questionnaire

During the _____ activity ...

	Very Untrue	Untrue	Neutral	True	Very True
1. I felt that the teacher provided me with choices and options	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I felt I was understood by my teacher.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The teacher showed confidence in my abilities to do well in the activity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The teacher encouraged me to ask questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The teacher listened to how I'd like to do things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The teacher tried to understand how I saw things before suggesting new ways to do things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. The teacher helped me to improve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The teacher made me feel like we were good in this activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I felt that the teacher wanted me to do well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The teacher made me feel like I was able to do the activities in class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The teacher supported me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The teacher encouraged me to work with others in practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. The teacher had respect for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The teacher was interested in me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I felt that the teacher was friendly towards me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX E: ENGAGEMENT AND DISAFFECTION QUESTIONNAIRE

	Not at all True	Not True	Neutral	True	Very True
1. I try hard to do well in PE class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. In PE class, I work as hard as I can	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. When I'm in PE class, I participate in class discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I pay attention in the PE class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. When I'm in PE class, I listen very carefully	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. When I'm in PE class, I feel good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When we work on something in PE class, I feel interested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The PE class is fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I enjoy learning new things in PE class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When we work on something in PE class, I get involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. When I'm in PE class, I just act like I'm working.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I don't try very hard in the PE class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. In PE class, I do just enough to get by	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. When I'm in PE class, I think about other things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. When I'm in PE class, my mind wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. When we work on something in PE class, I feel bored	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. When we start something new in PE class, I feel nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When we work on something in PE class, I feel discouraged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. The PE class is not all that fun for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. When I'm in PE class, I feel bad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX F: BASIC NEEDS SATISFACTION SCALE

Think of the physical activity you are enrolled while answering this questionnaire.

	Not at all True	Not True	Neutral	True	Very True
1. I can overcome challenges in my class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am skilled at my class activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I feel I am good at the class activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I get opportunities to feel that I am good at class content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I have the ability to perform well in this class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. In my class I get opportunities to make choices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. In my class, I have a say in how things are done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. In my class, I can take part in the decision-making process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. In my class, I feel I am pursuing goals that are my own	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. In my class, I really have a sense of wanting to be there	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. In my class, I feel close to other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I show concern for others in my class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. There are people in my class who care about me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. In my class, there are people who I can trust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I have close relationships with people in my class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX G: MOTIVATION SCALE

I take part in this activity class ...

	Not at all True	Not True	Neutral	True	Very True
1. because this activity is fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. because I enjoy learning new skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. because this activity is exciting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. because of the enjoyment that I feel while learning new skills/techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. because I want to learn sport skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. because it is important for me to do well in activity class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. because I want to improve in sport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. because I can learn new skills which I could use in other areas of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. because I want the teacher to think I'm a good student	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. because I would feel bad about myself if I didn't	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. because I want the other students to think I'm skillful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. because it bothers me when I don't	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. because that's what I am supposed to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. because I'll get into trouble if I don't	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. so that the teacher won't yell at me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. because that's the rule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. but I don't really know why	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. but I don't see why we should have activity class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. but I really feel I'm wasting my time in activity class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. but I can't see what I'm getting out of activity class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX H: PERSONAL INTEREST QUESTIONNAIRE (COLLEGE)

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
1. When I exercise in this class, I sometimes get totally absorbed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Because this class is fun, I wouldn't want to give it up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. This class is important to me personally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX I: STUDY 1 IRB

ACTION ON EXEMPTION APPROVAL REQUEST



TO: Joseph Otundo
Kinesiology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: November 1, 2016

RE: IRB# E10208

TITLE: Situational Interest In Middle School Physical Education: Are there Measurement Advantages to Adding Social Indicators?

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: 10/31/2016

Approved X Disapproved _____

Approval Date: 10/31/2016 **Approval Expiration Date:** 10/30/2019

Exemption Category/Paragraph: 1; 2a,b

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:** When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.

* 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>

APPENDIX J: STUDY 2 IRB

ACTION ON EXEMPTION APPROVAL REQUEST



TO: Joseph Otundo
Kinesiology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: October 13, 2016

RE: IRB# E10126

TITLE: Testing an Integrated Model of Interest Theory and Self-Determination Theory: Exploration of Structural Relationships

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: 10/13/2016

Approved X **Disapproved** _____

Approval Date: 10/13/2016 **Approval Expiration Date:** 10/12/2019

Exemption Category/Paragraph: 1; 2a,b

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: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

* 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

Joseph Opiri Otundo was born and grew up in Kakamega, Kenya. Joseph completed his B. ED (Arts) degree from Kenyatta University. Upon completion of his undergraduate degree, Joseph taught Health and Physical Education, and history in high school in Eldoret and Kitale, Kenya. Also, Joseph taught Health and Physical Education from K-7th grade in New Orleans, Louisiana. Joseph completed his master's degree in Health and Exercise Science from Southeastern Louisiana University, then progressed to Louisiana State University for doctoral studies.

Joseph received graduate assistantship through the school of Kinesiology at Louisiana State University, and later received Perkins Fellowship. He served as an instructor from 2013 to 2017. As an instructor at Louisiana State University, Joseph taught labs as well as lecture classes. Joseph has presented papers at both regional and national conferences. Joseph's research articles have been published in referred journals such as Research Quarterly for Exercise and Sports. Joseph's career goal is to become an exemplary teacher and renowned researcher. During free time Joseph likes reading, playing soccer, riding bike, playing tennis, and basketball.

Joseph is a certified Health Education Specialist (CHES), a licensed soccer coach and CPR/AED. Joseph is an active member of Society for Health and Physical Education (SHAPE) and Phi Kappa Phi. He is currently a doctoral candidate and he is graduating in the summer of 2017. Joseph has accepted a faculty position in the department of Kinesiology and Health Studies at Southeastern Louisiana University, Hammond, LA. Joseph's professional goal is to teach and mentor the upcoming generation of students that have passion for health and physical activity, and to continue with research.