An Investigation of Adolescent Girls’ Global Self-Concept, Physical Self-Concept, Identified Regulation, and Leisure-Time Physical Activity in Physical Education

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This study examined the relationships among identified regulation, physical self-concept, global self-concept, and leisure-time physical activity with a sample of middle and high school girls (N = 319) enrolled in physical education. Based on Marsh’s theory of self-concept, it was hypothesized that a) physical self-concept would mediate the relationship between identified regulation and global self-concept and b) physical self-concept would mediate the relationship between identified regulation and leisure-time physical activity. Data analysis revealed a structural model in which physical self-concept mediated the relationship between identified regulation and global self-concept as well as the relationship between identified regulation and leisure-time physical activity. Findings provide support for examining self-concept from a hierarchical and domain-specific perspective. Results also offer greater understanding about one possible mechanism that links physical education to increases in global self-concept and leisure-time physical activity, which are considered important outcomes of quality education.

Keywords: physical self-perceptions, physical self-worth, self-esteem, self-determination theory, physical self-esteem

One of the overall goals of physical education (PE) is to promote physical activity (National Association for Sport and Physical Education [NASPE], 2004). PE is a class that can enhance children’s enjoyment for physical activity; however, engagement in PE and physical activity outside of school often decreases as children transition into adolescence (Bryan & Solmon, 2012; Centers for Disease Control and Prevention [CDC], 2011; Gordon-Larsen, McMurray, & Popkin, 2000; Standage, Gillison, & Treasure, 2007). This is especially true for adolescent girls, who on average have lower attendance and participate less in PE than adolescent boys (CDC, 2011; Gordon-Larsen et al., 2000). Lower levels of participation and attendance may restrict adolescent girls’ potential to experience benefits associated with quality PE (NASPE, 2004). According to NASPE (2004), developing positive physical
self-concept and global self-concept are fundamental psychological outcomes of quality PE. Positive physical self-concept among adolescent females is associated with participation in physical activity not only during PE class, but outside of school as well (Cumming et al., 2011; Welk & Joens-Matre, 2007). Enhancing self-concept in PE, however, appears to be difficult for many adolescent girls. Findings from previous researchers suggest adolescent girls often report lower global and physical self-concepts than males in PE (Marius, Claudia, Florina, & Densia, 2011; Martin et al., 2010; Marsh, Trautwein, Ludtke, Koller, & Baumert, 2006). Although it is currently unclear why self-concept disparities exist for so many adolescent girls, it is possible that motivation in PE may be a contributing factor (Standage & Gillison, 2007; Standage, Gillison, Ntoumanis, & Treasure, 2012).

Global Self-Concept

Marsh and Shalveson (1985) developed a hierarchical and multidimensional model of self-concept (see Figure 1). In the model, self-concepts are defined as descriptive and evaluative self-perceptions within a specific domain (Marsh & Shalveson, 1985). Global self-concept resides at the top of the hierarchy and is considered a higher-order construct. In other words, global self-concept is theorized as a general representation of domain specific self-concepts. Academic and nonacademic domains reside below global self-concept. The academic domain represent students’ self-concepts of specific academic subjects, such as mathematics, science, and social studies, while the nonacademic domain represents social, emotional, and physical self-concepts (Marsh, 1990, 1999; Marsh & Craven, 2006; Marsh & O’Mara, 2008). Domain specific self-concepts are developed and refined through interactions and interpretations of one’s experiences in specific environments. For example, students develop mathematics self-concept based on interpretations of their experiences in mathematics contexts.

![Figure 1 — Marsh’s (1990) Multidimensional Global Self-Concept Framework.](Image)
Females typically report lower on measures of global self-concept (Marsh, 1990, 2002). In addition to gender differences, there is often a decline in global self-concept when individuals reach preadolescence. Marsh theorizes this decline in self-concept may be attributed to common characteristics of adolescent development such as increased emphasis on social comparison and greater self-awareness. During later-adolescence, this decline tends to stabilize and become more multifaceted (Marsh, 2002). Generating a better insight into the nature of self-concept is important because it’s related to both academic (US Department of Education, 2003) and health outcomes (Craven & Marsh, 2008). For example, self-concept is positively associated with psychological well-being and physical health and negatively associated with depression and obesity in adolescent girls (Park, 2003; Standage & Gillison, 2007; Standage et al., 2012).

**Physical Self-Concept**

In physical activity environments such as PE, physical self-concept is considered the domain-specific self-concept (Marsh, 1997, 2002; Marsh & Craven, 2006; Marsh & O’Mara, 2008). Physical self-concept is defined as an individual’s descriptive and evaluative self-perceptions of his/her physical appearance and physical abilities (Marsh, 1997). Students in PE have many opportunities to try new skills, display their physical abilities in front of others, receive feedback about their appearance, and experience both success and failure. Therefore, PE is an educational environment that impacts physical self-concept development (Gehris, Kress, & Swalm, 2010; Goodwin, 1999). In PE, a positive physical self-concept is related to engagement levels, skill development, and motor learning (Guerin, Marsh, & Famose, 2004; Peart, Marsh, & Richards, 2005). Past researchers have also demonstrated that if PE undermines physical self-concept, both long and short term gains in skill development can be restricted (Marsh & Peart, 1988). Physical self-concept is also positively associated with physical activity outside of PE and often impacts future adherence to physical activity (Marsh, Papaioannou, & Theodorakis, 2006; Schneider, Dunton, & Cooper, 2008).

Past researchers suggest that physical self-concept is one of the most important determinants of adolescent girls’ global self-concept (O’Dea & Abraham, 1999). This may be a result of the added social pressure that adolescent girls face in relation to their appearance (Fox, 1997). Females generally score lower on multiple dimensions of self-concept and there is considerable evidence that girls of all ages report a lower physical self-concept than boys on various subscales in a variety of settings, including PE (Asci, 2002; Caglar, 2009; Marsh, Hey, Roche, & Perry, 1997; Klomsten, Skaalvik, & Espenes, 2004; O’Dea & Abraham, 1999; Schmalz & Davison, 2006). Therefore, it is commonly accepted that adolescent girls face barriers in developing global and physical self-concepts on par with adolescent boys. More investigation of the PE specific factors related to adolescent girls’ physical self-concept and global self-concept could provide a better understanding about how to minimize the current gender disparities in self-concepts.

**Self-Determination Theory**

Craven and Marsh (2008) posit that motivation may play a key role in the development of positive self-concepts, but note that more empirical evidence is needed. A valuable framework for understanding motivation in PE and potential links with
self-concept is self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2007). Deci and Ryan (2000) theorize that motivation occurs on a continuum of self-determination, ranging from amotivation and controlled forms of extrinsic motivation, to autonomous forms of extrinsic motivation, to intrinsic motivation (Vansteenkiste, Niemiec, & Soenens, 2010). Amotivation resides on the lowest end of the self-determined continuum and is defined as the complete lack of motivation (Ntoumanis, Pensgaard, Martin, & Pipe, 2004). Amotivated students find little reward or value in PE and are often disengaged or do not participate in PE.

Controlled forms of extrinsic motivation involve the regulation of behavior as a result of external pressures, rewards, or punishments. In other words, external contingencies are not fully self-endorsed, resulting in behaviors that produce feelings of being controlled. External regulation and introjected regulation are the two types of controlled motivation in the SDT framework (Vansteenkiste et al., 2010). External regulation occurs when a student’s motivation to participate in PE is regulated by external means, such as a fear of punishment by the teacher. Introjected regulation is characterized by motivation grounded in self-imposed pride/self-worth or shame/guilt (Ryan & Deci, 2000, 2007). Although rewards and punishments are internal and regulated by the individual, the behavior is not fully endorsed. In essence, the individual is being controlled by himself/herself. For example, introjected regulation can occur when a student does not value participating in PE, but does so anyway out of a sense of obligation to the teacher.

Autonomous forms of extrinsic motivation are internally regulated and directed by one’s personal values of the external contingency. Identified regulation and integrated regulation are both autonomous forms of extrinsic motivation in the SDT framework (Vansteenkiste et al., 2010). Students who use identified regulation often choose to participate in an activity because it holds importance or has value (Ryan & Deci, 2000, 2007). For example, a student may decide to participate during an activity in PE because he or she believes that it will be beneficial to his or her overall health. The reward of increased health has been internalized as valuable by the student, producing self-endorsed regulation despite not necessarily gaining pleasure from the activity (Ryan & Deci, 2000; Vansteenkiste et al., 2010). Students who use integrated regulation choose to participate in an activity because they desire to do so and it aligns with their personal values. For instance, a student would participate in PE because he or she believes that it is important and participation in physical activity is a part of his or her identity.

Intrinsic motivation, on the other hand, is not associated with any external contingencies. Students who are intrinsically motivated to participate in PE do so for the purpose of enjoyment, satisfaction, and pleasure (Standage et al., 2007). Thus, the reward is derived from participating in PE itself, rather than outside agencies, resulting in the highest levels of self-endorsement and autonomous regulation. Intrinsic motivation is related to a host of positive behavioral, psychological, and social outcomes in PE (Standage et al., 2007) and is considered an important element for establishing a healthy and stable sense of self (Deci & Ryan, 1995).

It has been theorized by multiple researchers that autonomous motivation can shape oneself-concept (Deci & Ryan, 1995; Hein & Hagger, 2007). For example, students who experience autonomy and enjoyment from their physical activity behaviors in PE are more likely to positively evaluate their physical capabilities. On the other hand, students who experience dissatisfaction and external pressure over their physical activity behaviors in PE are more likely to negatively evaluate their
physical capabilities. Hein and Hagger (2007) reported that students’ autonomous motivation in PE was a positive predictor of their global self-concept. Additional researchers examining students have also documented positive correlations between identified regulation in PE and effort (Taylor, Ntoumanis, Standage, & Spray, 2010). This research has shown that identified regulation may play a substantial role in both student engagement in PE and self-concept. Unfortunately, with the documented declines in adolescent girls’ participation in PE and physical activity (CDC, 2011), it may be unlikely that the majority of adolescent girls engage in PE for solely intrinsic reasons. It is possible, however, some adolescent girls may choose to participate and exert effort in PE because the goals of their class align with their personal value systems. These students accept and value the importance of PE and have integrated the goals of PE into their own beliefs, even if they do not experience enjoyment from PE. At this point in time, the unique role that identified regulation in PE has with adolescent girls’ self-concept is limited in the PE literature base. Furthermore, researchers investigating motivation in PE have focused on global self-concept (e.g., Hein & Hagger, 2007) instead of physical self-concept, which is considered the domain specific self-concept in PE contexts (Marsh et al., 1997).

There are theoretical connections between identified regulation in PE and physical self-concept. For instance, identified regulation is often based on the need to feel competent and perceptions of competence are a central component of physical self-concept (Rhodewalt & Vohs, 2005; Vansteenkiste et al., 2010). Therefore, students who feel competent in PE would also likely have higher physical self-concepts. While previous researchers have provided initial evidence of the relationships between identified regulation, effort, and self-concept in PE, more research is needed in this area—specifically concerning the relationships between identified regulatory processes in PE and physical self-concept. According to the hierarchal and domain-specific nature of Marsh’s self-concept model, students’ identified regulation in PE would likely have an indirect relationship with global self-concept based on their level of physical self-concept. In other words, physical self-concept could mediate the relationship between students’ identified regulation in PE and their global self-concept.

In a similar manner, there are documented associations between identified regulation in PE and leisure-time physical activity. Specifically, identified regulation has been shown to consistently predict leisure-time physical activity among students in PE (Taylor et al., 2010) and students’ motivation in PE has been recognized to influence their motivation for participation in leisure-time physical activity (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003). There is also sufficient evidence to support that students with higher physical self-concepts are more physically active (Marsh et al., 2006; Trautwein, Gerlach, & Ludtke, 2008). Identified regulation and physical self-concept are both associated with positive physical activity behaviors and it is likely that students who use identified regulation would not only be more active, but may be so because they also have a positive physical self-concept. As a result, it is likely that students’ autonomous motivation in PE influences leisure-time physical activity indirectly as a result of their physical self-concept.

Therefore, the purpose of this study was to examine the relationships among identified regulation in PE, physical self-concept, global self-concept, and leisure-time physical activity in a sample of adolescent girls. We hypothesized that: (a) physical self-concept would mediate the relationship between students’ identified
regulation in PE and global self-concept; and (b) physical self-concept would also mediate the relationship between students’ identified regulation in PE and self-reported leisure-time physical activity. Gaining a better understanding of the relationships among students’ identified regulation in PE, physical self-concept, global self-concept, and leisure-time physical activity could help PE teachers develop practical strategies to motivate a greater proportion of adolescent girls to become more active participants in PE, increase their physical activity levels outside of school, and improve their feelings of physical self-concept.

Method

Participants

Participants in this study were 319 adolescent girls enrolled in required PE classes at one middle school and one high school in the Southeastern United States. Approximately 80% of students recruited chose to take part in the study. Four classes participated from the middle school and five classes participated from the high school (N = 9). Each class was taught by a certified PE teacher (N = 7) and all classes were same-sex PE classes. One teacher from each school taught two classes each. The girls were in grades eight (n = 110), nine (n = 89), and ten (n = 120), with a mean age of 14.25 years (SD=.91). The girls reported their ethnicity as Caucasian (78%), African American (19%), or Other (3%). Both schools used traditional sport-based multiactivity PE curricula; however, classes often started with short warm-up activities that stressed different components of health-related fitness.

Procedures

Permission to conduct this study was obtained from the University’s Institutional Review Board. Each school was contacted and permission was obtained from principals, PE teachers, and parents. In addition, each participant provided assent. Data were collected by the primary researcher and students completed questionnaires during their regular PE class time in place of their usual class activities. Questionnaires were explained to the students and they were informed that their responses would be kept confidential. Data collection took approximately thirty minutes to complete.

Measures

Identified Regulation. Students’ identified regulation in PE was assessed at the contextual level using the Perceived Locus of Causality (PLOC) scale (Goudas, Biddle, & Fox, 1994; Ryan & Connell, 1989; Wang, Hagger, & Liu, 2009). The identified regulation subscale of the PLOC contains four items that address the overall question “Why do I try hard in PE?”. Example items include “…because PE is important to me” and “…because I want to do well in PE”. All items were answered on a seven-point scale that ranged from 1 (not at all true) to 7 (very true). The PLOC has been widely used in PE research and is considered to be a valid and reliable instrument with adequate cross-cultural generalizability (Goudas et al., 1994; Ryan & Connell, 1989; Wang et al., 2009).
Global and Physical Self-Concept. The Physical Self-Description Questionnaire (PSDQ) was used to assess global self-concept and physical self-concept (Marsh, Richards, Johnson, Roche, & Treymayne, 1994). The PSDQ requires individuals to respond to declarative statements such as “I feel good about the way I look and what I can do physically.” and “Overall, most things I do turn out well.” on a 6-point Likert scale ranging from 1 (not at all true) to 6 (very true). The global self-concept subscale consists of eight items and the physical self-concept subscale consists of six items. The PSDQ has demonstrated acceptable psychometric properties in a host of samples, including adolescents in PE (Marsh, 1997, 2002; Peart et al., 2005).

Leisure-Time Physical Activity. The Leisure-Time Exercise Questionnaire (LTEQ) was used to measure the girls’ leisure-time physical activity (Godin & Shepard, 1985). The LTEQ has four items that examine weekly frequencies of vigorous, moderate, and mild physical activity during free time. In the first three items, students are asked to estimate the number of 15 min blocks per week that they engaged in vigorous, moderate, and mild physical activity. A weekly leisure-time physical activity score is calculated that reflects MET values: Activity Score = \(9 \times \text{strenuous blocks} + (5 \times \text{moderate blocks}) + (3 \times \text{mild blocks})\). The fourth question is a more general item that asks students to estimate how often they engage in regular physical activity long enough to “work up a sweat”. Students have three choices for this last item: (1) often; (2) sometimes; and (3) never/rarely. The LTEQ has demonstrated positive correlations with VO2 max scores and appears to adequately discriminate between fit and unfit individuals (Godin & Shepard, 1985).

Data Analysis

Data were initially screened for outliers and distribution characteristics were also examined. Descriptive statistics and simple correlations were then calculated for all variables. Structural equation modeling (AMOS 20.0) was used to examine the adequacy of the proposed model (i.e., measurement model) and the pattern of proposed relationships (i.e., structural model). Latent variables were created for each variable using multiple indicators from students’ questionnaire responses (Byrne, 2001). Specifically, the latent factor “identified regulation” was measured with the four items from the identified regulation subscale of the PLOC and the latent factor “leisure-time physical activity” was measured with two indicators, the activity score and general item from the LTEQ. Partially aggregated indicators (i.e., parcels) were created for the physical self-concept and global self-concept latent variables (Little, Cunningham, Shahar, & Widaman, 2002). Parcels can increase the parsimony of a structural equation model by reducing parameter estimates and increasing the reliability of indicators (Coffman & MacCallum, 2005). Three indicators are generally identified as representing the ideal number of indicators for SEM model stability (Little et al., 2002). Therefore, the six indicators of physical self-concept were randomly parceled into three indictors: (a) indicator 1 = mean score of items 1 and 3; (b) indicator 2 = mean score of items 2 and 6; (c) indicator 3 = mean score of items 4 and 5. The same procedure was followed for the latent factor “global self-concept”: (a) indicator 1 = mean score of items 1, 4, and 5; (b) indicator 2 = mean score of items 2, 7, and 8; (c) indicator 3 = mean score...
of items 3 and 6. The first test of the measurement model consisted of examining the standardized factor loadings of each latent variable. Standardized factor loadings above .40 were considered adequate indicators while factor loadings above .60 were considered strong indicators (Hair, Anderson, Tatham, & Black, 1998). Global and incremental indices were also used to test the measurement model, including the $\chi^2 / df$ ratio, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA) (Kline, 2005). Kline suggests that: (a) a $\chi^2 / df$ ratio around three represents an adequate fit, with lower ratio indicating a better fit; (b) CFI and TLI around .90 represent an adequate fit, with higher values (.95) indicating good fit; and (c) RMSEA values around .08 represent an adequate fit, with lower values (.06) indicating a good fit. The pattern of relationships was tested simultaneously via the structural model (Byrne, 2001). Standardized beta weights were used to examine the direct effects and indirect effects in the structural model.

Results

Descriptive Statistics

Means, standard deviations, and Cronbach’s reliability coefficients for identified regulation, physical self-concept, global self-concept, and leisure-time physical activity are reported in Table 1. Identified regulation, physical self-concept, and global self-concept had mean scores above the midpoint of their respected scales.

Simple Correlations

Relationships among variables were first examined by testing bivariate correlations (see Table 1). All variables had small to moderate positive correlations except the association between global self-concept and physical self-concept, which had a moderate to strong positive correlation. The relationship between physical self-concept and global self-concept was similar to previous work using Marsh’s self-concept theory (Marsh et al., 1994).

Table 1 Descriptive Statistics and Simple Correlations of All Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>M (SD)</th>
<th>( \alpha )</th>
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<tbody>
<tr>
<td>IDR</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.33 (1.53)</td>
<td>.86</td>
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<tr>
<td>PSC</td>
<td>.27**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.29 (1.31)</td>
<td>.95</td>
</tr>
<tr>
<td>GSC</td>
<td>.22**</td>
<td>.70**</td>
<td>-</td>
<td>-</td>
<td>4.99 (.98)</td>
<td>.90</td>
</tr>
<tr>
<td>LTPA</td>
<td>.18**</td>
<td>.28**</td>
<td>.19**</td>
<td>-</td>
<td>48.56 (26.49)</td>
<td>-</td>
</tr>
</tbody>
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Note. IDR = identified regulation; PSC = physical self-concept; GSC = global self-concept; M = mean; SD = standard deviation; \( \alpha \) = Cronbach alpha estimate.

* p< .05; ** p< .01.
Structural Equation Modeling

Findings are presented in Figure 2.

**Measurement Model.** Standardized factor loadings ranged from .59 to .96. It should be noted that the standardized factor loading for the general item on the LTEQ (-.076) was negative based on the reversed orientation of the scale (i.e., 1= often; 2= sometimes; 3= never/rarely). The fit indices represented an average to good fit. The $\chi^2/df$ ratio (126.17/49) was 2.58, the CFI= .97, the TLI = .95, and the RMSEA= .07.

![Figure 2](image.png)

**Figure 2** — Findings of hypothesized model. Identified = identified regulation in PE; Physical = physical self-concept; GSC = global self-concept; LTPA = leisure-time physical activity. Fit indices: $\chi^2/df$ ratio = 126.17/49 = 2.58; CFI = .97; TLI = .95; RMSEA = .07. All standardized beta estimates are significant ($p<.05$) expect path between identified regulation and GSC and identified regulation and LTPA. Indirect effect between identified regulation and GSC ($\beta = .21$). Indirect relationship between indemnified regulation and LTPA ($\beta = .14$). Physical self-concept $R^2 = .08$; GSE $R^2 = .54$; LTPA $R^2 = .26$. 
Structural Model. The pattern of relationships reflected our general hypotheses. Identified regulation had a direct relationship with physical self-concept ($\beta = .28$) and accounted for 8% of the variance. Identified regulation did not have significant direct effects with global self-concept ($\beta = .05$) or leisure-time physical activity ($\beta = .09$). The indirect effects for identified regulation on global self-concept ($\beta = .21$) and leisure-time physical activity ($\beta = .14$) were stronger than the direct effects. Physical self-concept had direct effect on global self-concept ($\beta = .72$) and leisure-time physical activity ($\beta = .47$). The model predicted 54% of the variance of global self-concept and 26% of the variance of leisure-time physical activity. Taken together, the results supported the mediating role of physical self-concept in the model by students’ identified regulation in PE.

Discussion

An important mission of public schools is to enhance students’ global self-concept through quality educational experiences (US Department of Education, 2003). Similarly, quality PE is designed to develop positive perceptions of one’s physical characteristics, physical competence, and overall self-esteem while promoting physical activity (NASPE, 2004). According to the US Department of Education (2003), many adolescent girls are at risk for having negative self-concept due, in part, to physical self-concept pressures and disturbances. This study was designed to provide a more comprehensive view of the complex relationships among adolescent girls’ identified regulation in PE, physical self-concept, global self-concept, and leisure-time physical activity.

Evidence supported our hypotheses that physical self-concept was a key factor in bridging identified regulation in PE to global self-concept (i.e., hypothesis 1) and leisure-time physical activity (hypothesis 2). Significant positive correlations between identified regulation in PE and global self-concept as well as leisure-time physical activity established associations between the independent variable and outcome variables. Results of the structural model revealed that identified regulation in PE had a direct relationship with physical self-concept, but not global self-concept or leisure-time physical activity. Furthermore, physical self-concept had direct relationships with both global self-concept and leisure-time physical activity. The indirect relationships between identified regulation in PE and the outcome variables were approximately twice as strong as the direct relationships. Taken together, the evidence supported our notion that physical self-concept was a mediating variable (MacKinnon, Fairchild, & Fritz, 2007). This provides an important contribution to the literature because it highlights a process through which students in PE who may not be intrinsically motivated can still reach important PE and health outcomes.

Because adolescent girls’ physical self-concept appears to be a mechanism that facilitates positive health outcomes in and outside the PE context, it may be especially important for physical educators to find ways to enhance it. The link between identified regulation in PE and physical self-concept may provide insights for physical educators. Guay, Delisle, Fernet, Julian, and Senecal (2008) posit that identified regulation helps to focus thoughts and feelings about oneself to a personal standard of success, and limits concern about social
judgment. Similarly, participating in physical activities perceived to be meaningful and valuable creates greater opportunities to enhance thoughts about one’s physical self because the behavior is fulfilling personal goals (Deci & Ryan, 1995). Therefore, physical educators should consistently gather feedback on students’ values and preferences of physical activities when making curricular and instructional choices as well as explicitly highlight the value of engaging in PE activities. Previous research has indicated that when teachers take students’ feedback and preferences into consideration, students will feel a greater sense of autonomy (Reeve & Jang, 2006). Although this may sound straightforward in theory, implementing simplistic or mindless physical activities (e.g., running laps, dodgeball, jumping-jacks) without providing any explanation of the educational, health, or social benefits is a far too common practice in secondary PE. Our results indicate that when students value and identify with the goals of PE, they are more likely to have higher physical self-concept and engage in physically activity outside of school.

The link between physical self-concept and global self-concept ($β=.74$) is also noteworthy. This supports previous researchers’ reports of the important role of physical self-concept in relationship to global self-esteem during adolescence (O’Dea & Abraham, 1999). Adolescent girls are often critical of their personal attributes during a developmental period that emphasizes social comparison (Harter, Bresnick, Bouchey, & Whitesell, 1997) and places pressure on physical appearance and body ideals that are typically unrealistic (Durkin & Paxton, 2002). PE represents a public environment where physical appearance and bodies are often on display. The girls of study were placed in same-sex classes and it is unclear what effect this had on the results. During informal conversations, some of the physical educators suggested that same-sex classes increased the girls’ motivation for PE and reduced girl-boy social pressure, but there is no formal evidence documented in this study that this was actually the case. Past research has reported that females are often more likely to be influenced by the gender make-up of the class (Lyu & Gill, 2011) and that students typically rate themselves higher in physical self-concept domains that are deemed gender appropriate (Caglar, 2009; Klomsten et al., 2004). Future research would benefit greatly by investigating same-sex and coeducational PE classes in relationship to adolescents girls’ motivation, physical self-concept, and global self-concept. Based on Marsh’s (2002) theorizing and our results, we hypothesize that the relationship between physical self-concept and global self-concept would likely remain stable across different gender structures in PE while the relationship between motivation in PE and physical self-concept would be more dynamic.

These results hold many implications for PE teachers. Specifically, teachers should design a curriculum that is geared to fostering the development of both identified regulatory processes for motivation and physical self-concept among adolescent females. By doing so, it is likely that global self-concept and leisure-time physical activity will be impacted as well. The girls in this study were exposed to traditional sports-based multiactivity curriculum in their PE classes which consisted of two to three week units that emphasized gameplay over skill development. Implementing PE curriculum that provides students with more time to develop skills, establish social bonds, and establish internal frames of reference could potentially increase girls’ identified regulation in PE and physical self-concept as well as impact the
relationship between the two. For example, Gehris et al. (2010) found that tenth grade students viewed their participation in adventure education curriculum as a valuable environment to exercise in PE, more so than traditional PE exercises such as team sports and going to the weight room. Furthermore, students reported increases in their internalization of the health benefits received from participating in adventure education. Implementing choice-based PE programs for middle school and high school girls is another practical strategy that could enhance girls’ identified regulation. In many secondary PE programs, girls are forced to participate in curriculum with a heavy emphasis on team sports, which in some cases, may not match physical activity values. A choice-based program may help remedy this issue. Future research should continue to investigate the impact of choice-based curriculum in relation to adolescent girls’ autonomous motivation (Johnson, Prusak, Pennington, & Wilkinson, 2011) and physical self-concept.

This research makes a significant contribution by providing clarification about the underlying processes in the relationships between identified regulation of motivation in PE, physical self-concept, global self-concept, and leisure-time physical activity. It is important for future PE researchers to account for the domain-specific nature of self-concept (i.e., physical self-concept) because it provides a more holistic understanding of associations that PE factors have with global self-concept and leisure-time physical activity. This study is not without limitations. The cross-sectional design of this study does not allow for cause and effect relationships to be made. It is also important to note that students were enrolled in required PE classes, which could potentially impact their motivation for PE. In addition, the sample for this study was restricted to adolescent females. Future researchers would benefit from research designs that provide evidence for cause and effect relationships or potential reciprocal effects between autonomous motivation and self-concepts. Future studies would also make substantial contributions by investigating additional age groups, cultures, and by examining relationship similarities or differences between males and females.

In conclusion, the findings of this study highlight the important role PE teachers can play in students’ lives when it comes to self-concept and physical activity behaviors outside of school. Physical educators should design their curriculum with students’ values and personal goals in mind. If students see the activities in PE as beneficial and identify with lesson objectives, then they will be more likely to have a positive physical self-concept and will also be more active outside of class. Likewise, teachers need to explain both the short and long-term benefits of physical education to students. When students align their personal belief systems with those of the PE class, teachers can have a lasting impact on students’ self-concept and leisure-time physical activity.

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