

## **The Effects of Choice on the Motivation of Adolescent Girls in Physical Education**

**Keven A. Prusak**  
Brigham Young University

**Darren C. Treasure, Paul W. Darst, and Robert P. Pangrazi**  
Arizona State University

This study examined the motivational responses of adolescent girls in the physical education setting to having choices of walking activities. Seventh and 8th grade girls ( $N = 1,110$ ) in 42 intact physical education classes participated in this study. Classes were randomly assigned to choice ( $n = 21$ ) and no-choice ( $n = 21$ ) groups. Participants' situational and contextual motivation was assessed using the Situational Motivation Scale (SIMS) and the Sport Motivation Scale for PE (SMSPE). The SIMS was administered every 3 days during the intervention. The SMSPE was administered as the pre- and posttest. Significant differences indicated that the choice group (a) was more intrinsically motivated, (b) had higher identified regulation, (c) experienced less external control, and (d) was less amotivated. Moderate to large effect sizes were noted. A significant difference in amotivation at the contextual level was noted. Results suggest that adolescent female PE students may be more motivated if given choices. The notion of emerging adult attitudes is presented and explored.

**Key Words:** self-determination, autonomy, activity, high school girls

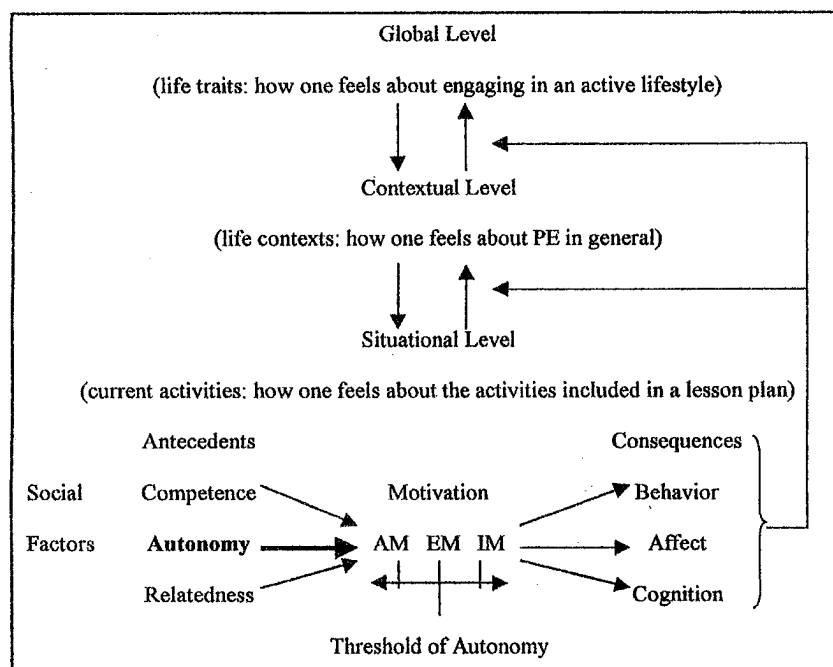
Why students, and later adults, choose to adopt a physically active lifestyle can be viewed as a motivational question. Deci and Ryan's (1985) theory of self-determination has been proposed as providing a "comprehensive and prescriptive model for increasing PA in sedentary sub-populations" (Sallis & Hovell, 1990, p. 320). Self-determination theory may allow researchers to examine emerging adult dispositions in adolescent girls due to the effects of immediate practices in physical education.

If the ultimate success of physical education is to be measured by increasing the numbers of active adolescents and adults, researchers must assess emerging adult attitudes that result from childhood experiences. Self-determination theory allows the examination of how the activities in a particular lesson plan affect student motivation (a) in the situation, (b) in the context of physical education, and

(c) eventually in one's global disposition toward becoming active as an adult. In other words, this theory provides the framework for examining what logic, and more recently research (e.g., Taylor, Blair, Cummings, Wun, & Malina 1999), has supported between physical education and emerging adult behaviors.

Self-determination theory proposes that there are three antecedents—competence, autonomy, and relatedness—that affect one's motivational state. Students who perceive they are competent (a sense of "I can do"), autonomous (a sense of "I have choices"), and related (a sense that "I can be successful in the social milieu") should be more motivated to engage in a certain behavior. This study examines in part how an increase in autonomy affects the motivation of adolescent girls to participate in physical education.

Self-determined behavior can be described by three distinct motivational states: (a) amotivation, a lack of motivation; (b) extrinsic motivation, or engaging for reasons that emanate from outside the self, such as rewards or coercion; and (c) intrinsic motivation, or engaging for reasons that emanate from within the self or within the activity itself. These motivational states can be ordered along a continuum on which amotivation and intrinsic motivation are on opposite ends (see Figure 1). Movement along the continuum is in part governed by internalizing motives for participating, so that those once extrinsic become intrinsic. In this



**Figure 1** — Hierarchical model of Self-Determination Theory and the three levels of generality within which self-determined behaviors occur. Two-way arrows indicate top-down and recursive relationships between levels. Autonomy (bold), as it affects one's position on the self-determination continuum, is the central focus of this study. Note: AM = amotivation, EM = extrinsic motivation, IM = intrinsic motivation.

shift along the continuum, it is suggested that one crosses a threshold of autonomy (Whitehead, 1999).

The theory further proposes that as one's motivational state moves toward intrinsic motivation, increases in cognition (e.g., deeper understanding), behavior (e.g., increased participation), and affect (e.g., attitude) will result. High levels of intrinsic motivation in students are desirable because students will participate for reasons not limited to the influence of the setting—grades, the teacher, or forced participation. In other words, they will more likely become physically active on their own.

Expanding on Deci's (1985) work, Vallerand (1997, 2001) has presented evidence that self-determined behaviors occur at different levels of generality: global, contextual, and situational (see Figure 1). Understanding the nature of and the relationship among these levels is key to understanding how this theory may allow us to examine emerging adult attitudes and dispositions toward adopting a physically active lifestyle. Global dispositions, therefore, are life traits (e.g., attitudes, beliefs, perceptions, philosophies) that are most stable and enduring as they guide adult behaviors. Contextual dispositions are traits that operate within a particular contextual setting such as physical education class or the school setting. Situational dispositions are those that operate in the here and now, specifically related to the activities in which one is currently engaged. These are the learning activities such as skill drills, fitness activities, and games in the daily lesson plan.

This hierarchical model posits top-down effects between proximal levels of generality (see Figure 1, top-down arrows). In other words, global motivation can have an effect on contextual motivation, which can then have an effect on situational motivation. The model further posits recursive, or bottom-up effects (Figure 1, bottom-up arrows). Thus this hierarchical framework allows for a refined examination of whether daily practices in physical education lesson plans (i.e., situational) do indeed develop favorable attitudes toward physical education (i.e., contextual) and then toward choosing a physically active lifestyle (i.e., global). As is common in hierarchical structures, the higher the level of generality, the more stable or enduring the trait and thus the more resistant to change. Therefore, changes at the next highest level can occur after consistent and repetitive occurrences of increased self-determination at the next lower level (Vallerand, 1997, 2001).

The purposes of this study were to assess the effects of choice on (a) the motivation of adolescent girls in the physical education setting and (b) the recursive effects from the situational level, i.e., current activities, to the contextual level, i.e., how they feel about physical education in general. It was hypothesized that those classes having choices of activities would experience higher levels of situational self-determination than those with no choices of activities. Further, it was hypothesized that the recursive effects would be evident in increased contextual self-determination of the choice classes, and will increase due to having choices.

## Method

### Participants

Participants were 7th and 8th grade girls ( $N = 1,110$ ). They were members of 42 intact classes with an average enrollment of 24.9 students (range = 17 to 34) in five junior high schools in two school districts from a large metropolitan area in the U.S. Southwest with an ethnically diverse population of middle-income fami-

lies. Nine female physical education teachers with 1 to 27 years of teaching experience ( $M = 11$  years,  $SD = 7.4$ ) implemented all instructional and experimental procedures. All classes were single sex and met daily for a 50-min period that typically offered a variety of team and individual sports.

### Measures

**Contextual Self-Determination.** A modified version of the Sport Motivation Scale (SMSPE) was used to measure intrinsic motivation (IM), extrinsic motivation (EM), and amotivation (AM) (Briere, Vallerand, Blais, & Pelletier, 1985; Pelletier, Fortier, Vallerand, et al., 1995) at the contextual level. Students responded to 28 statements (4 items on 7 subscales) on a 7-point Likert scale wherein "describes me not at all" = 1 and "describes me exactly" = 7. This scale is a contextual motivational measure which assesses the motivational dispositions of students toward physical education in general.

**Situational Intrinsic Motivation.** A modified Situational Motivation Scale (SIMS) was used to measure motivation at the situational level (Guay & Vallerand, 2000). The stem states, "Why are you currently engaged in these walking activities?" Students again responded to 16 items on a 7-point Likert scale. For example, they responded that they were participating in the current activities (a) "because I think that this activity is interesting" or (b) "because I don't have a choice." All surveys were proctored using the same set of instructions that were read prior to each survey. Each survey has demonstrated acceptable levels of validity and reliability (Briere et al., 1995; Guay & Vallerand, 2000).

### Procedure

A novel walking-unit-of-instruction (for complete description of activities and analysis of separate data set, see Prusak & Darst, 2002) created for this study was used for the following reasons: (a) walking is uncommon to physical education and is less likely to be associated with preexisting attitudes toward physical education; (b) a greater degree of experimental control was possible with a standardized intervention; (c) walking is not skill-dependent and thus is less likely to deter participation due to lack of perceived competence (Napper-Owen, Kovar, Ermler, & Mehrhof, 1999); and (d) walking is an appropriate activity in line with current trends and national recommendations for physical activity (PA) in a health-promotion model. A total of nine activities were created and then field-tested for age and developmental appropriateness as well as manageability. The teachers attended one of two 90-min workshops in which they were briefed on all instructional and experimental procedures. Instructions included how and when to administer the surveys, how to conduct the walking activities, and how to give instructions specific to each treatment group.

One week prior to the intervention, all students completed the SMSPE to assess general existing attitudes toward physical education at the time of the pretest. All teachers taught an even number of classes (range 2 to 6) which were then randomly assigned into either the choice group ( $n = 21$ ) or the no-choice group ( $n = 21$ ). Randomly assigning half of each teacher's classes to each group allowed for equal distribution of teacher affect across both groups. This is a true experimental design that examined between-group differences.

On Day 1 of the intervention, the walking unit was introduced and all students were given a handout summarizing the benefits of walking as a lifetime activity. It was at this time that the notion of having or not having choices was first emphasized. Teachers were instructed to tell the classes in the choice group that they would be making many choices during the unit about which activity and with whom they would be participating. The no-choice groups received statements such as, "I have chosen to do walking with you for the next 2 weeks," or "I will choose the groups you work in." These types of verbal cues were continued throughout the walking unit.

On Days 2 through 4, all students participated in the same three activities. The choice group was allowed to choose from three activities held simultaneously, and with whom they were to participate. They made these choices on each of these 3 days. Conversely, the no-choice group simply participated in the activity for that day, followed by the assigned activity for each subsequent day. At the end of Day 4 all participants completed the SIMS survey.

On Days 5 through 7 a new set of three activities was introduced using the same procedure described above, followed by completing the SIMS for a second time. Likewise, Days 8 through 10 followed the same procedure and the SIMS was completed for a third time. The SMSPE was administered as the posttest on the next school day.

All students were assigned an identification number and all surveys were matched accordingly. Surveys were recorded by a team of research assistants and rechecked visually for missing data or keystroke errors. The resulting data set,  $N = 1,110$ , was used for subsequent analyses.

### Data Analysis

Class means for all items were calculated. All subsequent analyses were performed on these class means, thus making the unit of analysis at the class level (Silverman & Solomon, 1998). The data from the SMSPE were reduced from 28 items to 7 subscales by finding the average of each of the four corresponding items. A pre- to postgain score was calculated on each of the seven subscales for further between-group analysis. Similarly, the 16 items of SIMS were reduced to four subscales by finding the average of each of the four corresponding items. Subsequent analyses were conducted on these subscale scores.

Preliminary analyses, conducted to check for outliers, normality, and reliability, were performed on each subscale. Data also included a grade variable (i.e., 7 or 8). Group membership was coded as 0 = no choice and 1 = choice. Internal consistency was assessed by calculating a Cronbach alpha on each subscale on both questionnaires. Pearson correlations were calculated among respective subscales of each questionnaire to assess the stability of the underlying simplex pattern (i.e., strongest correlations between adjacent subscales). If a simplex pattern were evident, correlations among the subscales would provide evidence supporting the self-determination continuum (Pelletier et al., 1995).

The Self-Determination Index (SDI) was calculated by weighting the SIMS subscales by +2 for the intrinsic motivation (IM) subscale, +1 for the identified regulation (IR) subscale, -1 for the external regulation (ER) subscale, and -2 for the amotivation (AM) subscale. The SDI provided a manipulation check (Pelletier et al., 1995). Interpreting this index score is straightforward: the higher the index

score, the more a class is self-determined. Significant between-group differences in the SDI scores would indicate that the manipulation was successful. Between-group differences were examined using one-way ANOVA to examine individual subscales of interest (Tabachnick & Fidell, 1996; Vincent, 1999; Wagoner, 1994). Effect sizes were calculated on all significant group differences (Cohen, 1990).

## Results

### Reliability and Internal Consistency

All distributions were found to be normal. Internal consistency was assessed using Cronbach's  $\alpha$  for SIMS. All subscales from both instruments showed alphas above .88, with the exception of the posttest (SMSPE) subscales of introjected regulation ( $\alpha = .62$ ) and identified regulation ( $\alpha = .63$ ). Acceptable reliability scores are generally considered to be  $\geq .7$  (see Table 1, on diagonal).

### Simplex Pattern of SIMS

Pearson correlations were computed between SIMS subscales. All correlations are significant,  $p < .01$ . These correlations support the simplex pattern of the SIMS instrument. This supports the assertion that AM, EM, and IM can be appropriately ordered along a continuum (see Table 1, above diagonal). The simplex pattern of the SMSPE was not supported in this study.

### Manipulation Check: Self-Determination Index Score

Significant group differences on the SDI,  $F(1, 40) = 9.67$ ,  $p \leq .01$ , scores indicate that the intended manipulation was successful. The effect size ( $ES = .960$ ) indicates a large treatment effect of autonomy on the students' situational motivation (see Table 2).

**Table 1** Internal Consistency Values: Cronbach Alpha and Pearson Correlation

SIMS Subscales <sup>†</sup>	1	2	3	4
1. Intrinsic motivation	[.94]	.93**	-.76**	-.77**
2. Identified regulation		[.90]	-.79**	-.78**
3. External regulation			[.96]	.79**
4. Amotivation				[.92]
				[.93]**

Note: Alphas are on the diagonal and correlations are above it. Strongest positive correlations between IM and IR along with strongest negative correlations between IM, ER, and AM support simplex pattern of SIMS.

\*\*Significant correlations  $p < .01$ ; <sup>†</sup>Mean alphas of all three SIMS surveys; <sup>††</sup>Mean of all alphas on diagonal.

**Table 2** Means and Standard Deviations of Self-Determination Index and Respective Effect Sizes

	Mean	SD	Effect size
SIMS1 SD-Index			.960 <sup>†††</sup>
Group 0	1.99	2.79	
1	4.85**	3.16	
SIMS2 SD-Index			.975 <sup>†††</sup>
Group 0	1.41	3.67	
1	4.85**	3.38	
SIMS3 SD-Index			.928 <sup>†††</sup>
Group 0	2.28	3.26	
1	5.50**	3.67	

\*\*  $p < .01$ ; <sup>†††</sup>Large effect size.  $ES = (M_1 - M_2)/SD_{pooled}$ ; <sup>†††</sup>Large treatment effect ( $>0.70$ ).

### Having Choices of Walking Activities

**Situational Motivation Response.** Group means, standard deviations, significance levels, and effect sizes for SIMS 1, 2, and 3 are shown in Table 3. All group means on each subscale are in the expected direction. That is, the choice group means for IM and identified regulation (IR) are higher than those of the no-choice group, and the means for external regulation (ER) and AM are lower for the choice group than for the no-choice group.

There were significant differences in situational motivation (via SIMS), indicating that the choice group: (a) was more intrinsically motivated,  $F(1, 40) = 10.793$ ,  $p < .01$ ; (b) had a higher sense of identified regulation,  $F(1, 40) = 7.91$ ,  $p < .01$ ; (c) had a lesser sense of external control,  $F(1, 40) = 8.623$ ,  $p < .01$ ; and (d) was less amotivated,  $F(1, 40) = 4.10$ ,  $p \leq .05$ . It is apparent that allowing choices had a significant and immediate effect on student situational motivation. Clearly, students moved farther along the continuum toward IR and IM when given choices of walking activities.

Effect sizes were calculated to assess the magnitude of treatment effects when significant differences were detected (see Table 3, ES). Moderate and large effect sizes indicate that providing choices resulted in a strong treatment effect on situational motivation.

**Contextual Motivation Response.** Significant within-group, pre-to-post differences were noted solely in the gain score of the amotivation subscale of the SMSPE. The choice group was significantly less amotivated pre to post,  $F(1, 40) = 4.695$ ,  $p < .05$ . This indicates that initial positive contextual changes which resulted in moving away from being amotivated toward physical education are evident. No significant differences between groups were noted on the gain scores of any of the remaining six subscales.

**Table 3 Means and Standard Deviations and Effect Sizes for Choice and No-Choice Groups on 3 SIMS Questionnaires and for 4 Subscales**

Subscale	Choice		No Choice		ES
	M	SD	M	SD	
SIMS1 IM	4.24**	.56	3.65	.60	1.014 <sup>†††</sup>
IR	4.69**	.62	4.16	.60	.868 <sup>†††</sup>
ER	3.43**	.77	4.08	.65	-.906 <sup>†††</sup>
AM	2.45*	.46	2.70	.33	-.623 <sup>††</sup>
SIMS 2 IM	4.21**	.64	3.61	.75	.861 <sup>†††</sup>
IR	4.66**	.64	4.01	.66	.996 <sup>†††</sup>
ER	3.37***	.82	4.24	.73	-1.069 <sup>†††</sup>
AM	2.44*	.46	2.79	.66	-1.496 <sup>†††</sup>
SIMS 3 IM	4.47*	.72	3.94	.66	.771 <sup>†††</sup>
IR	4.59**	.66	3.99	.66	.914 <sup>†††</sup>
ER	3.24**	.85	4.11	.68	-1.128 <sup>†††</sup>
AM	2.39*	.51	2.74	.48	-.700 <sup>††</sup>

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p \leq .001$ ;  $ES = (M_1 - M_2) / SD_{pooled}$ ; <sup>††</sup>Moderate treatment effect (0.41–0.70). <sup>†††</sup>Large treatment effect (>0.70).

## Discussion

This study manipulated choice and no-choice conditions in order to create more or less autonomy supportive environments. Treatment groups were differentiated solely on the basis of having or not having a choice of activities. Results indicated that providing choices significantly increased the situational motivation and lessened the contextual amotivation of the participants. This suggests that when students are given choice and autonomy in selecting learning activities, they are more apt to be motivated. This finding is not surprising, and the challenge is to determine how much choice students should be offered ranging from total choice to choice within a choice. For most students in this study, even a little input about what and how they are to learn increased their motivation.

This study was conducted within the theoretical framework of self-determination. The tenets of this theory propose that when students are given choices of activities, they are more intrinsically motivated than those with no choices. Further, the tenets of self-determination theory assert that repeated increases in situational motivation will, over time, result in increases in contextual motivation (Vallerand, 2001). It is possible that this 10-day unit of instruction may have been too short to expect contextual changes in attitudes toward physical education in general. Yet it is encouraging to see that this intervention has resulted in a positive move along the continuum, and in particular away from the state of amotivation. Additional studies over a longer period of time are needed to assess whether positive changes in the situation will indeed result in changes in contextual motivation.

These results are supported by a number of studies which have shown that when students perceive the environment as autonomy supportive, they are more motivated (Deci & Ryan, 1987; Grolnick & Ryan, 1987; Miserandino, 1996; Patrick, Skinner, & Connell, 1993). Specifically, Grolnick and Ryan (1987) applied self-determination theory in the educational setting and found that more self-determined forms of learning resulted in greater conceptual learning. Miserandino (1996) found that students who felt their sense of autonomy was compromised reported more negative affect and withdrawal behaviors. Conversely, students in autonomy supportive contexts were shown to be more involved, persistent, and curious, and demonstrated higher academic performance.

We made considerable effort to assure that the walking activities suited the situation and the participants. The activities were designed to meet current PA guidelines and were manageable by one teacher when put in combination of three simultaneous activities. It appears that designing activities to operate simultaneously and thereby offer choices to students is a sound instructional approach for teachers. Offering choices, albeit choices the teacher selects prior to the lesson, allows students to become more self-directed. It allows them to examine their own motives for participating. Having choices places more of the responsibility for the outcomes on their shoulders. Whether students enjoyed the activity or not, it probably was not a serious issue since they selected it. Trying a number of activities allows them to learn which ones suit their needs and to avoid activities they find irrelevant to their interests. This may instill favorable attitudes toward choosing a physically active lifestyle as students begin exercising self-determined behaviors in the physical education setting.

Since this study offered choice of walking activities, it seems relevant to share some thoughts about adolescent exercise behaviors. It is increasingly evident that certain behaviors such as inactivity or negative early experiences track into adulthood (Raitakari et al., 1994; Taylor et al., 1999). It is also evident that there is a sharp decline in physical activity throughout adolescence, and particularly so for girls (President's Council on Physical Fitness and Sports, 1996; Spain & Franks, 2001). Adolescent girls may be particularly underserved by traditional physical education offerings such as team/individual sports (Napper-Owen et al., 1999). Particular attention should be paid to this population in order to understand the reasons for this reduction in physical activity, and to aid in the design and implementation of effective programs.

Recent trends support the shift toward a PA based curriculum. Walking is one activity that can serve as an alternative to the sport based activities so common in physical education. The merits of employing walking in the school setting are many. Walking is inexpensive, not skill dependent, and can be designed with a variety of characteristics—social, game-like, competition—thereby appealing to most everyone (Prusak & Darst, 2002). Choosing from a variety of walking activities further adds to the appeal of this lifetime activity. Walking in the school setting allows for coincidental instruction as to its lifelong benefits. A strength of this study is that it was designed to apply the theory in a realistic manner.

The results of this study suggest that student motivation in the physical education setting can be increased by including a variety of activities and then allowing students to choose which best suits them. It supports a thoughtfully designed curriculum that allows choice while at the same time holding students to high levels of accountability (Pangrazi, 2001). Further, adolescence is typified by the

desire for increased independence from authority figures (Darst & Pangrazi, 2002; Pangrazi, 2001) and this should be considered in curricular decisions. In other words, the need for autonomy in a situation as a precursor to motivation on the contextual and global levels may be especially salient during adolescence. Therefore, creating autonomy-supportive activities and programs for adolescents may be especially effective (Pangrazi, 2001; Rowland, 1999).

The limitations of this study center on the fact that the participants were all girls in single-sex classes. It does not address the male population in single-sex classes or both sexes in coed classes. Therefore, additional studies offering choices in each of these settings are recommended in order to assess how choices in physical education affect all students. While these findings within the whole of the motivation literature lend credence to the central hypothesis, further research testing that hypothesis in different curriculums and activities should be pursued to assess the utility of these conclusions.

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