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# Self-Regulation of Physical Education Teacher Education Students' Attitudes Towards Exercise and Diet

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## Abstract

The purpose of this study was to assess differences in self-regulation of attitudes towards engaging in exercise and eating a healthy diet between physical education teacher education (PETE) students and general education (GE) students, and between male students and female students. Participants were university students ( $n = 194$ ) at a university in the Intermountain West in the U.S. Results showed that PETE students were more autonomous in their attitudes towards exercise than other students, all female students were more controlled in their attitudes towards diet than males, and PETE females' attitudes towards diet were more controlled than PETE males. PETE curricula should include experiences to help students internalize exercise and healthy diet values so they will develop attitudes towards engaging in exercise and eating a healthy diet for autonomous reasons.

*Key Words:* self-determination, healthy lifestyles

In 2009 there was not a single state in the U.S. that met the *Healthy People 2010* obesity target of 15% or less for adults. In fact the opposite seems to be the trend with the number of states with obesity rates of  $\geq 30\%$  increasing from zero in 2000 to nine in 2009. The overall estimated rate of adult obesity in 2009 was 26.7% (Centers for Disease Control and Prevention, 2010). Children and adolescents are not far behind. Using measured heights and weights, an estimated 17% of U.S. children ages two to 19 are obese (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), and Sing, Mulder, Twisk, Van, Chinapaw (2008) state that childhood obesity often continues into adulthood.

Perfectly placed to help prevent childhood obesity are physical education (PE) instructors who have a prime opportunity to educate about the benefits of exercise, encourage children and young adults to participate regularly in physical activity (Sallis & McKenzie, 1991; Wright, Patterson, & Cardinal, 2000), and to engage in other healthy behaviors such as good diets (Prusak et al. 2011). Prusak et al. reinforced the view that PE should be a public health tool with a healthy and active lifestyle management (HALM) focus. They suggest such a focus should include elementary classes in which the children are highly active, successful and having fun; and utilizing a health club model in secondary schools which allow for activity choices, teaching HALM skills, and accountability. In addition, Prusak et al. further emphasized the need for Physical Education Teacher Education (PETE) programs to prepare new teachers so they can teach with this HALM focus and model appropriate exercise and diet habits.

Modeling healthy lifestyles is important according to Melville and Maddalozzo, (1989). They found that high school students expressed a decreased intent to exercise and a less favorable rating of an overweight instructor's expertise and role model

appropriateness. Indeed, Social Learning Theory proposes that most behavior is learned from observing (Bandura, 1986), underscoring the need for current and future physical educators who are good role models of healthy lifestyles in order to exert a positive effect on their students (National Association for Sport and Physical Education, 2004). Some physical educators espouse the value of living a physically active lifestyle, but do not regularly participate in physical activity (PA) themselves (Melville, 1999). In fact some in-service PE teachers' health-related fitness scores did not meet the standard of achievement expected of a ninth-grade student (Castelli & Williams, 2007).

Cardinal (2001) found that PE professionals and pre-professionals who were physically active and had lower body mass index (BMI) scores had more favorable attitudes toward role modeling compared to inactive respondents and respondents with higher BMIs. He also found that self-perceived fitness level and actual physical activity were important variables in forming a positive attitude toward role modeling (Cardinal & Cardinal, 2003). From these findings, positive attitudes towards role modeling are linked to healthy lifestyle behaviors and this should be considered by PETE programs that are preparing new teachers who model appropriate exercise and diet behaviors, as previously mentioned. Attitudes that precede behavior are affected by factors that cause an individual to be motivated, or moved to do something (Ryan & Deci, 2000b). For example, a PETE student may not value eating a healthy diet, yet he/she knows it is something they should do. So the student is motivated by guilt, and has an attitude of "I do not want to eat a healthy diet but I will because I know I should," which leads to the behavior of eating a healthy diet. Hence, it is helpful to examine how PETE students are motivated in their attitudes towards exercise and dietary habits. In order to do so, we will consider one theory that explains the foundation of self-determined attitudes and behavior.

## Self-Determination Theory

Ryan and Deci's (2000a) self-determination theory (SDT) provides a theoretical framework to examine the motivational processes of PETE students for engaging in regular exercise patterns and a healthy diet. SDT proposes that people are active in their pursuit of behaviors and activities, and that this activity results in personal growth and a unified, coherent sense of self. According to this theory, behavioral engagement is motivated according to one's position along a graded continuum of regulations ranging from being more coercive in nature to being highly self-determined (or self-regulated) and, therefore, autonomous. Specifically, SDT posits that there are three motivational states that lie on this continuum of self-determined attitudes and behavior: amotivation (the state of lacking the intention to act); extrinsic motivation (doing an activity in order to attain some separable outcome), and intrinsic motivation (doing an activity for the inherent satisfaction of the activity itself).

Additionally, Ryan and Deci (2000a) propose that there are four levels of extrinsic motivation that vary in their relative autonomy, moving from more coercive to more autonomous. The way that extrinsically motivated attitudes and behaviors become more autonomous is through a process referred to as 'organismic integration.' With this process, the regulation and underlying values of an externally motivated behavior are internalized, and progressively blended with other aspects of the core self. The more a behavior is internalized and becomes part of one's self, the more a person will experience autonomy in their attitudes and when performing the behavior (Ryan & Deci, 2000a; Ryan, Sheldon, Kasser, & Deci, 1996). The four levels of extrinsic motivation are external regulation, introjected regulation, identified regulation, and integrated regulation. Externally regulated behavior is engaged in by an individual to gain a reward or avoid punishment, and therefore reflects an influence by others. Since the locus of control lies outside of the individual, it is the least autonomous form of extrinsic motivation and is perceived as controlling in nature. For example, a person who exercises because another person makes him/her exercise is externally regulated.

Moving along the regulatory continuum, the next point is introjected regulation which is behavior that occurs due to feelings of guilt or to gratify pride, and is controlled by forces within the individual. (Ryan & Deci, 2000a; Ryan & Deci 2000b; Ryan et al. 1996). An example is someone who eats a healthy diet to avoid feeling guilty if she/he does not act according to what others think is the best thing to do.

Whitehead (1993) identified the 'threshold of autonomy' (located between introjected and identified) which provides a distinction between controlling and autonomous regulation. Identified behavior is therefore more autonomous than external and introjected regulation. For example, when a person consciously accepts the value of eating a healthy diet, he/she is engaging in identified regulation. The person identifies with the importance of a healthy diet and adopts the regulation of that diet as his/her own. However, the identified behavior is not always compatible with the individual's other values and actions, and thus, some degree of internal conflict is still felt.

Integrated regulation is the most autonomous form of extrinsic motivation. It occurs when an identified behavior is fully incorporated with the self and is consistent with a person's values and actions. Behavior is performed with a sense of choice that is congruent with the core self. However, the behavior is aimed at the attainment of separate outcomes rather than enjoyment of the activity itself, and therefore, still has some element of extrinsic motivation. An example of this is when a person exercises to maintain fitness, because he sees himself as being a fit person.

Intrinsic motivation is the archetype of self-determination and is the root of behaviors that are engaged in for their own sake, simply for the pleasure, interest and satisfaction derived from doing them (Levesque et al., 2007). SDT (Ryan & Deci, 2000a) further proposes that as individuals move along the motivation continuum from amotivation towards intrinsic motivation, there will be an increase in cognition (deeper understanding), behavior (increased participation), and affect (better attitude). Thus, according to application of this theory, the self-regulated PETE student would be more likely to practice healthy diet and

exercise patterns because they either value the outcome (identified regulation), having healthy diet and exercise habits is part of who they are as an individual (integrated regulation), or because it is pleasurable, satisfying, and interesting (intrinsic motivation). Indeed, a sense of autonomy is deemed to be an essential factor for achieving durable behavior change (Deci & Ryan, 1985; Ryan & Deci, 2000a; Sheldon, Williams, & Joiner, 2003). Hence, an autonomous motivational state with respect to personal healthy diet and exercise habits is surely a desirable motivational state for future physical educators to help them be good role models of healthy lifestyles for their students.

Based on SDT, and the fact that individuals' attitudes influence their behavior, we felt that it was important to examine the motivational attitudes of PETE students towards engaging in exercise and eating a healthy diet compared to other university students. To date there have not been any studies that have examined this topic.

The purpose of this study was to assess differences in self-regulation of attitudes towards engaging in exercise and eating a healthy diet between PETE students and general education (GE) students, and between male students and female students.

## **Method**

### **Instruments**

The 15-item Treatment Self-Regulation Questionnaire (TSRQ), which is part of the Health-Care, SDT Questionnaire Packet (Williams, Ryan, & Deci, 2011a) was used in this study. The TSRQ measures the degree of autonomous self-regulation regarding why people do, or would do, some healthy behavior. It was first developed by Ryan and Connell (1989) and since then has been modified to assess a variety of health behaviors. This study utilized two questionnaires, the TSRQ (Exercise) and the TSRQ (Diet) (Williams, Ryan, & Deci, 2011b), which have both shown to be valid instruments with acceptable internal consistency of each subscale (most values >0.73; Levesque et al., 2007). Autonomous forms of extrinsic motivation (i.e. identification and integration) have been found to be associated with positive health (Williams, McGregor, Zeldman, Freedman, & Deci, 2004), whereas controlling forms of motivation (i.e. external and introjection) and amotivation have all been linked to poorer health (Williams, 2002).

In the TSRQ (Exercise) participants are first given the introductory statement, "The following question relates to the reasons why you would either start to exercise regularly or continue to do so." In the TSRQ (Diet) the introductory statement is, "The following question relates to the reasons why you would either start eating a healthier diet or continue to do so." In both instruments, participants are then presented with a stem, "The reason I would exercise regularly/eat a healthy diet is," followed by 15 items that represent reasons that vary in the degree to which they reflect autonomous regulation specific to exercise and healthy diet.

There are three subscales to the questionnaire: the autonomous regulatory style (six items which focus on identification and integration); the controlled regulatory style (six items); and amotivation (three items). Examples of more autonomous reasons include "Because I feel that I want to take responsibility for my own health" and "Because I personally believe it is the best thing

for my health.” Examples of more controlled reasons are “Because I would feel guilty or ashamed if I did not exercise regularly/eat a healthy diet” and “Because others would be upset with me if I did not.” Examples of more amotivated reasons are “I really don’t think about it” and “Because it’s easier to do what I’m told than think about it.” Participants rate each reason on a 7-point Likert scale, which ranges from “not at all true” (1 point) to “very true” (7 points). Responses to the respective items for each regulatory style, (autonomous, controlled, and amotivation) are averaged to give a self-regulation score for each of the three styles that forms the reflection of motivation for the target behavior of exercise and diet.

**Participants and Procedure**

The participants were 194 students (males,  $n = 82$ , and females,  $n = 112$ ) from a university in the Intermountain West of the U.S and were predominantly (90%) Caucasian. Students were voluntarily selected from the PETE major (males,  $n = 28$ , and females,  $n = 69$ ) and other majors (males,  $n = 54$ , and females,  $n = 43$ ). Students in the other majors were enrolled in GE classes that were not health-related.

Permission to conduct the study was obtained from the Institutional Review Board at the university. A researcher from the institution contacted two professors, one who taught a GE course, and one who taught PETE courses, to obtain their permission to talk to the students in their classes about the study. Then the researcher took five minutes at the beginning of these classes to explain the study, and ask for volunteers. Volunteers immediately signed and returned an informed consent form, then anonymously completed the two paper questionnaires in class.

**Data Analysis**

Data was entered into a Microsoft Excel file and missing data were dealt with using a list-wise deletion. The dependent variables for exercise were the averaged self-regulation scores for: autonomous regulation of exercise (EAU), controlled regulation of exercise (EC), and amotivation towards exercise (EA). The dependent variables for diet were the averaged scores for: autonomous regulation of diet (DAU), controlled regulation of diet (DC), and amotivation towards diet (DA).

Cronbach’s alpha was used to assess internal consistency and reliability for each subscale (e.g. EAU) for both the TSRQ (Exercise) and the TSRQ (Diet). Pearson correlations were computed among the self-regulation scores to: 1) assess the simplex pattern (i.e. there is a positive/stronger correlation between adjacent items and a negative correlation between distal items on the proposed continuum) of the questionnaire, and 2) assess the relationship between exercise and diet variables that were in similar regulatory categories (e.g. EAU and DAU).

Subjects were grouped based on major (PETE and GE). Means and standard deviations were computed for all dependent variables: EAU, EC, EA, DAU, DC, and DA. One-way MANOVAs were computed examining the effect of major and gender, on the exercise and diet regulation scores. When significance was found, follow-up univariate ANOVAs were calculated. The same procedure was used to compare PETE students’ self-regulation scores by gender, and GE students’ scores by gender. A Bonferroni adjustment to

the traditional .05 alpha level was made because there were three dependent variables for exercise (EAU, EC, and EA), so the alpha level was  $.05/3 = .017$ . There were three dependent variables for diet (DAU, DC, and DA), so the alpha level was also set at .017 for computations to do with diet. Effect sizes were calculated for each significant difference using eta square ( $\eta^2$ ).

**Results**

**Reliability and Internal Consistency**

Cronbach’s alpha was used to assess internal consistency for the three subscales of the TSRQ (Exercise) and the three subscales of the TSRQ (Diet), and values are located on the diagonal (in parenthesis) in Table 1. The overall reliability score was .75 for the TSRQ (Exercise) questionnaire and .76 for the TSRQ (Diet) questionnaire. Reliability scores are considered adequate when values are alpha .70.

**Simplex Pattern of the TSRQ (Exercise) and TSRQ (Diet)**

Pearson correlations (shown on Table 1) were computed among the three exercise self-regulation scores (EAU, EC, EA) and among the three diet self-regulation scores (DAU, DC, and DA), and generally supported the simplex pattern of the TSRQ. Regarding the exercise scores, a weak, negative correlation was found for the relationship between EAU and EA ( $r(191) = -.294$ ,  $p .01$ ) indicating a significant relationship between these two variables at opposite ends of the self-determination continuum. A weak, positive correlation between EAU and EC was found ( $r(191) = .179$ ,  $p .05$ ). However, no significant correlation was found between EC and EA. Similar correlations were found for the diet scores. In addition, significantly positive correlations ( $p < .01$ ) were found between comparable exercise and diet variables (not included in Table 1). Specifically,  $r$  value of correlation between EAU and DAU, between EC and DC, and between EA and DA is .715, .819, and .710 respectively.

**Table 1. Internal Consistency Values: Cronbach's Alpha and Pearson Correlation for TSRQ (Exercise) and TSRQ (Diet)**

TSRQ (Exercise)			
Subscale	EAU	EC	EA
EAU	(.89)	.179*	-.294**
EC		(.82)	.131
EA			(.56)
(.75) <sup>a</sup>			
TSRQ (Diet)			
Subscale	DAU	DC	DA
DAU	(.87)	.173*	-.477**
DC		(.86)	.027
DA			(.56)
(.76) <sup>a</sup>			

Note. EAU = autonomous regulation of exercise; EC = controlled regulation of exercise; EA = amotivation towards exercise; DAU = autonomous regulation of diet; DC = controlled regulation of diet; DA = amotivation towards diet.

<sup>a</sup>Mean alpha of all subscales.

\* $p < .05$ . \*\*  $p < .01$ .

**Self-Regulation of Attitudes Towards Exercise and Diet**

Descriptive statistics (means and standard deviations) are shown in Tables 2-3. All students were relatively autonomous in their attitudes towards engaging in exercise and eating a healthy diet. A one-way MANOVA was computed examining the effect of major on the exercise regulation scores. A significant effect was found (Wilks'  $\Lambda$  (3,189) = .931,  $p > .003$ ). Follow-up univariate ANOVAs indicated there was a significant difference for EAU, ( $F(1,191) = 13.88, p = .000, \eta^2 = .07$ ; see Table 2). Green and Salkind (2005) proposed that  $\eta^2$  values of .01, .06 and .14 could be interpreted as small, medium and large effect sizes, respectively. PETE students were significantly more autonomous in their attitudes towards exercise than GE students. Results of a one-way MANOVA examining the effect of major on the diet regulation scores revealed no significant effect ( $p = .463$ ).

With respect to the relationship of gender and self-regulation attitudes, no significant effect of gender on the exercise was found ( $p = .182$ ). However, the effect of gender on the diet was

significant, with Wilks'  $\Lambda$  (3,190) = .939,  $p = .007$ ). Follow-up univariate ANOVAs indicated there was a significant difference for DC, ( $F(1,192) = 11.88, p = .001, \eta^2 = .06$ ; see Table 2). Female students felt significantly more controlled in their attitudes towards diet than male students.

To compare gender differences in self-regulation scores among PETE students' one-way MANOVA was used. A significant effect was found for diet (Wilks'  $\Lambda$  (3,93) = .868,  $p > .004$ ). Follow-up univariate ANOVAs indicated there was a significant difference for DC, ( $F(1,95) = 12.63, p = .001, \eta^2 = .12$ ; see Table 3). PETE females felt more controlled than males for diet. Results of a one-way MANOVA examining the effect of gender on PETE students' exercise regulation scores revealed no significant effect ( $p = .095$ ). The same comparison of gender differences in self-regulation scores was conducted among GE students as well and the results of one-way MANOVA on exercise regulation scores revealed a significant effect (Wilks'  $\Lambda$  (3,93) = .915,  $p > .041$ ). Follow-up univariate ANOVAs indicated there was a significant difference for

**Table 2. Means and Standard Deviations of Self-regulation Scores by Major and Gender**

	PETE (n = 97)		GE (n = 97)		Males (n = 82)		Females (n = 112)		p	$\eta^2$
	M	SD	M	SD	M	SD	M	SD		
<b>Exercise Scores</b>										
EAU	6.36*	.66	5.94	.87	6.19	.65	6.12	.89	.000	.07
EC	3.59	1.34	3.50	1.13	3.35	1.20	3.68	1.25		
EA	1.97	1.04	2.05	.85	2.02	.90	2.00	.98		
<b>Diet Scores</b>										
DAU	5.94	.82	5.78	.89	5.79	.83	5.92	.89		
DC	3.23	1.35	3.30	1.07	2.92	1.07	3.51*	1.26	.001	.06
DA	2.24	1.03	2.27	1.00	2.30	1.00	2.21	1.02		

Note. EAU = autonomous regulation of exercise; EC = controlled regulation of exercise; EA = amotivation towards exercise; DAU = autonomous regulation of diet; DC = controlled regulation of diet; DA = amotivation towards diet.

\*  $p < .017$  (Bonferroni alpha adjustment for multiple comparisons).

**Table 3. Means and Standard Deviations of Self-regulation Scores by Gender within Major**

	PETE				GE				p	$\eta^2$
	Males (n = 28)		Females (n = 69)		Males (n = 54)		Females (n = 43)			
	M	SD	M	SD	M	SD	M	SD		
<b>Exercise Scores</b>										
EAU	6.31	.57	6.38	.69	6.13	.69	5.71	1.01		
EC	3.04	1.45	3.80	1.24	3.50	1.03	3.50	1.25		
EA	1.95	1.13	1.98	1.01	2.06	.78	2.04	.94		
<b>Diet Scores</b>										
DAU	5.70	.79	6.04	.82	5.83	.85	5.71	.95		
DC	2.51	1.24	3.52*	1.28	3.14	.90	3.51	1.23	.001	.12
DA	2.26	1.09	2.23	1.00	2.33	.96	2.19	1.06		

Note. EAU = autonomous regulation of exercise; EC = controlled regulation of exercise; EA = amotivation towards exercise; DAU = autonomous regulation of diet; DC = controlled regulation of diet; DA = amotivation towards diet.

\*  $p < .017$  (Bonferroni alpha adjustment for multiple comparisons).

EAU, ( $F(1,95) = 5.76, p = .018, \eta^2 = .06$ ; see Table 3). However, with the Bonferroni adjusted alpha level of .017, this result was not significant. Results of a one-way MANOVA examining the effect of gender on the diet regulation scores of GE students revealed no significant effect ( $p = .148$ ).

### Discussion

The purpose of this study was to assess differences in self-regulation of attitudes towards engaging in exercise and eating a healthy diet between PETE students and GE students, and between male students and female students. Overall, the self-regulation means showed that all students were relatively autonomous in their attitudes towards exercise and diet. The results of this study showed that PETE students were more autonomous in their attitude towards exercise than other university (GE) students, all female students were significantly more controlled in their attitudes towards diet than males, and PETE females were significantly more controlled in their attitudes towards diet than PETE males.

It is not surprising that PETE students would be more autonomous in their exercise views, as one would hope that students entering the profession would be more autonomous than other students towards exercise. The PETE students may have internalized a healthy approach in their attitudes towards exercise due to a combination of factors. For example, they may have self-selected into the major due to an inherent interest in the field of physical education and a desire to help combat the huge, national obesity problem. In addition, the PETE program may have had a positive effect on helping them become more autonomous towards exercise. A higher level of autonomy may lead to more durable exercise habits (Deci & Ryan, 1985; Sheldon et al., 2003). As for the attitude toward diet, while there was no significant difference between PETE and GE students in attitudes toward diet, both groups were relatively autonomous. However, there is room for both groups to move to being more autonomous in eating a healthy diet.

As for gender differences, we found that all females, regardless of major, were significantly more controlled in their attitudes towards diet, than males. Further analysis showed there was no difference between the GE male and GE female students for any of the exercise or diet variables. However, PETE females felt more controlled for diet (medium effect size) than PETE males. PETE students experience many physically active situations where their bodies are on display, e.g. they wear shorts or swimsuits. Fredrickson and Roberts (1997) propose in their objectification theory that many individuals internalize an outsider's view of their own bodies, termed self-objectification, whereby they become preoccupied with how the body appears to others. Women experience an increase in body dissatisfaction when exposed to self-objectifying situations (Hebl, King, & Lin, 2004). This pressure may have contributed to the fact that PETE females felt more controlled in their attitudes towards diet than PETE males.

While autonomous regulation is optimum to achieve durable change (Deci & Ryan, 1985; Sheldon et al., 2003), it seems important to point out that according to SDT (Ryan & Deci, 2000a) people might still initiate and engage in positive behaviors (in this case exercise and healthy eating habits) while feeling controlled to greater or lesser degrees. Therefore, they might still achieve

healthy outcomes in their own lives and be good role models as future physical educators. However, the likelihood of enduring change is increased for those who remain engaged in the process of internalization and moving towards greater autonomy (Deci & Ryan, 1985; Sheldon et al., 2003). The process of moving towards greater autonomy may happen in stages, so that an individual in one situation could be in the process of moving towards autonomy, but still feeling controlled to some degree in another situation. In other words they do not suddenly become fully autonomous. Rather, moving towards autonomy is a process as students begin to internalize values, but are still not entirely free from the original controlling factors at work in their lives (Ryan & Deci, 2000a).

In summary, all students in this study showed high levels of autonomy in their attitudes regarding exercise and eating a healthy diet. This is a positive sign that the university population is autonomously regulated towards these very important behaviors. PETE students were more autonomous in their attitudes toward exercise, all female students were more controlled in their attitudes towards diet, and female PETE students were more controlled in their attitudes towards diet than PETE males. We now recommend further research to explore why females felt more controlled in their attitudes towards diet, and also to discover the relationship between self-regulation and the actual exercise and diet behaviors of this population.

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