

## PEDAGOGY

# Exploring the Relationship Between Self-Determination Theory and Physical Education Teachers Meeting Recommended Weekly Physical Education Minutes

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## Abstract

*Physical activity (PA) continues to decrease and obesity rates continue to rise among children and adolescents. Researchers, along with other organizations, have recommended schools to be ideal venues to help increase overall childhood PA. However, research reports K–12 physical education (PE) is not required in the majority of states and most students do not achieve the recommended amount of weekly PE minutes. This can have a devastating effect on not only the students but also the teachers. PE teachers need to have competence, autonomy, relatedness, support, and resources available to teach an effective PE curriculum. The primary purpose of this study was to investigate if schools are meeting recommended total weekly PE minutes and the effect of meeting recommended total weekly PE minutes on PE teachers'*

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*autonomy, competence, and relatedness. In this study, the majority of PE teachers worked in schools that met the recommended weekly PE minutes, but teachers who worked in schools that did not meet the recommended weekly PE minutes felt that there was a lack of resources at their schools and felt they were less competent in their abilities to implement effective PE courses. If teachers are not given the proper amount of time or resources to teach the necessary content, then they will not believe they are competent to teach a course that is effective.*

According to the Centers for Disease Control and Prevention (CDC, 2017), childhood obesity has more than tripled in youth ages 6-19 since the 1970s. Additionally, the U.S. Department of Health and Human Services (2012) found among youth ages 6 to 19, almost 33% are considered to be overweight or obese and approximately 18% are considered obese. A key factor in rising obesity rates among youth is lack of daily physical activity (PA; National Institutes of Health, 2015; National Physical Activity Plan [NPAP], 2016). Children need accessibility to safe routes for walking and bicycling to school, green spaces or community centers to play in, and a variety of extracurricular activities such as sport, dance, or fitness programs to be active, but in some cities accessibility to these necessities can be limited (Let's Move, 2014). Furthermore, by the time children become adolescents, they experience greater decline in PA and begin to live a more sedentary lifestyle. According to the NPAP (2016), only 26.1% of school-aged children participate in the recommended 60 min/day of PA. Additionally, only about 50% of adolescents attend a minimum of one physical education (PE) class weekly and attendance drops significantly from elementary into the high school years (NPAP, 2016).

### **Physical Education Requirements in Schools**

While PA continues to decrease and obesity rates continue to rise, researchers and other organizations have recommended schools to be ideal venues to help increase overall childhood PA (Institute of Medicine, 2013; Pate et al., 2006). According to the Institute of Medicine (2013), "...because children and adolescents spend so many hours at school, school-related physical activity must be a large contributor to overall physical activity among youth" (p. 1). Within the school environment, students can benefit from classroom lessons

that include PA breaks; PA programs offered before, during, and after school; organized sports or intramurals programs; active recess for elementary students; or active transport to and from school (CDC, 2013; Pate et al., 2006). Many organizations highlight adopting or creating programs similar to a Comprehensive School Physical Activity Program (CSPAP; CDC, 2014). Programs like CSPAP encourage PA throughout the school day through five distinct components including quality PE, PA during school, PA before and after school, staff involvement, and family and community engagement (NPAP, 2016). A commonality among these organizations regarding PA in schools is they all emphasize quality PE as the centerpiece for increasing PA among students.

However, according to *Shape of the Nation Report* (SHAPE America, American Heart Association, & Voices for Healthy Kids, 2016), findings for PE requirements indicate school-aged children and youth are not necessarily receiving adequate time in PE. Furthermore, most states require participation in PE in Grades K–12, but most states also allow waivers, exemptions, and substitutions from participation in PE. On average, approximately 37.3% of states meet the recommended 150 min/week of PE at the elementary level and approximately 20.7% the recommended 225 min/week in middle/junior high and high school.

A plausible solution to rising obesity rates would be for schools to offer quality PE during the school day when teachers have direct access to students. Many benefits can be gained from a quality PE program that increases students' moderate-to-vigorous PA (MVPA) levels and provides cardiovascular endurance, muscular strength and endurance, and flexibility and bone-strengthening exercises to improve students' overall health. According to SHAPE America (2016), the goal of PE, as defined by the standards, is to “develop physically literate individuals who have the knowledge, skills and confidence to enjoy a lifetime of healthful physical activity” (p. 1). To effectively provide these skills for students, PE teachers must have a range of knowledge; the autonomy to implement a diverse curriculum, the competency to provide a variety of activities such as individual and team sports, adventure, dance, and fitness education; and the support of administration, staff, parents, and students.

## PE Teachers and Self Determination Theory

According to Ryan and Deci (2000, 2002), self-determination theory (SDT) emphasizes that three psychological needs facilitate growth, social development, and well-being in people. Deci and Ryan (2000) stated, “. . . according to SDT, a critical issue in the effects of goal pursuit and attainment concerns the degree to which people are able to satisfy their basic psychological needs as they pursue and attain their valued outcomes” (p. 227). These three needs are autonomy (i.e., the need to self-direct one’s behavior), competence (i.e., the need to engage effectively in one’s environment), and relatedness (i.e., the need to feel a sense of connectedness to other people; Deci & Ryan, 2000, 2002). According to the Deci and Ryan, autonomy and perceived competence are important for motivation and psychological well-being. Past research has found that relatedness is less central to intrinsic motivation, serving as a distal support that aids in the increase of overall motivation (Deci & Ryan, 2000). Teachers whose three basic needs are met in the work environment are more likely to be motivated to reach the goals they have set for their classroom and more likely to provide quality instruction to all students.

According to Skaalvik and Skaalvik (2014), those who feel a sense of perceived autonomy in teaching feel they have the ability to choose goals, pedagogical strategies, and desired curriculum, which allows for freedom and integration based on their educational beliefs and values. Research has suggested teacher autonomy is positively related to job satisfaction (Skaalvik & Skaalvik, 2014). Unfortunately, when PE teachers are not working in autonomous environments, the end results can lead to burnout, emotional exhaustion, depersonalization, or feelings of reduced accomplishment (Skaalvik & Skaalvik, 2014). Likewise, PE teachers who are “confronted with performance evaluations which are contingent on student performance” (Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014, p. 105) might question their abilities in the subject area, which leaves them feeling less competent. These evaluations occur often in PE, leaving teachers questioning their curriculum and delivery of content.

According to Ernst, Corbin, Beighle, and Pangrazi (2006), fitness scores, such as Fitnessgram, should not be used in the evaluation of teacher effectiveness or overall quality of the PE program. Evaluating teachers on overall student performance does not

allow administration to observe other areas taught such as skill development, social skills, or positive attitudes on lifetime fitness or PA. When teachers work in supportive environments that include the proper curriculum elements, they are more likely to feel confident and motivated to implement effective courses (Daniels, 2017). Research has confirmed the need for a certain amount of weekly PE minutes and shown the effect of SDT on PE teachers' motivation. However, limited research has investigated whether schools are meeting the recommended minutes and the effect of this on PE teachers' motivation. Guided by SDT, this study investigated whether schools are meeting recommended total weekly PE minutes and the effect of meeting recommended total weekly PE minutes on PE teachers' autonomy, competence, and relatedness.

## **Method**

A Midwestern university's institutional review board approved the research study. Data were collected via a questionnaire administered at a Midwestern state conference for PE teachers. After survey administration, surveys were recorded and analyzed in SPSS 20. Only the research team had access to the electronic file that stored survey responses.

### **Participants**

Study participants ( $n = 148$ ) included elementary, middle, and high school PE teachers. At a 2016 state conference, PE teachers were approached and asked if they would like to participate in a study. If they said yes, they read and signed the informed consent. Participants then completed the survey either on paper or on SurveyMonkey on an iPad. Participants answered questions concerning their (a) demographics, (b) meeting the total recommended weekly minutes of PE per week, (c) and the need satisfaction at work scale. Participants were encouraged to answer each question accurately before submitting survey responses electronically.

### **Measurement of Need Satisfaction at Work**

The Basic Psychological Needs at Work Scale (BPNWS) was developed by Brien et al. (2012). The BPNWS assesses basic psychological need satisfaction based on the SDT (Deci & Ryan, 1985, 2002). The BPNWS consists of 18 items (6 competence items;

6 autonomy items; 6 relatedness items). Cronbach's alpha values showed high internal consistency estimates among all three BPNWS scales ( $\alpha > 0.90$ ; Brien et al., 2012). Questions were modified to be specific to PE teachers and here are a few examples: I feel like I determine how I teach physical education skills to the students, I feel like I have a good relationship with the teachers I work with, I feel like I determine how I assess student skills, I do not feel very competent with my implementation of PE, I have been able to implement new PE skills/curriculum at my school, and people at work tell me I am good at what I do.

### **Data Analysis**

Descriptive statistics were analyzed among study participants (PE teachers) including gender, age, teaching experience, community type, and frequency of teachers meeting the recommended weekly PE minutes. Each of the five measured constructs (autonomy, competence, relatedness, support, and resources) were analyzed to determine group differences among teachers meeting PE minute recommendations and those not meeting PE minute recommendations. A regression analysis showed the combined effect of the measurable constructs (autonomy, competence, relatedness, support, and resources) on the outcome of interest (PE teacher meeting minute recommendations), as well as which construct(s) were most influential. Significance was established at 0.05.

### **Results**

Participants represented 42.6% females ( $n = 63$ ) and 57.4% males ( $n = 85$ ) from urban ( $n = 47$ ), rural ( $n = 18$ ), and suburban ( $n = 83$ ) communities. Of the participating PE teachers, 72.8% ( $n = 108$ ) met the PE recommended total weekly minutes (K–5th grade = 150 min/week, 6th–12th grade = 225 min/week). See Table 1 for demographics.

An analysis of variance measured the difference of motivational constructs (autonomy, competence, and relatedness) and teaching constructs (support and resources) among PE teachers meeting and not meeting recommended PE teaching minutes. Teachers who met the PE recommended teaching minutes reported significantly more competence compared to those not meeting the recommended PE minutes,  $F(4, 148) = 15.38, p = 0.001$ . Further, both sets of teachers

**Table 1**  
*Participant Demographics*

<b>Demographic</b>	<b><i>n</i></b>	<b>%</b>
Gender		
Female	63	42.6
Male	85	57.4
Age		
20–25	5	3.4
26–30	32	21.6
31–35	40	27
36–40	25	16.9
41–45	16	10.8
46–50	12	8.1
51–55	13	8.8
56+	5	3.4
Teaching Experience		
0–5 years	47	31.8
6–10 years	32	21.6
11–15 years	28	18.9
16–20 years	16	10.8
21–25 years	11	7.4
26+ years	14	9.5
Community Type		
Urban	47	31.8
Rural	18	11.6
Suburban	83	56.5
Meet Recommended PE Teaching Time		
Yes	108	73
No	40	27

reported resources as being major barriers; however, those who did not meet the recommended PE minutes reported resources as being significantly more of an implementation barrier,  $F(4, 148) = 4.85$ ,  $p = 0.029$ . See Table 2 for ANOVA data.

**Table 2**

*ANOVA: Comparisons Among Motivation Constructs, Support, and Resources Among Teachers Meeting and Not Meeting the Recommended PE Instruction Minutes*

<b>Motivation construct</b>	<b><i>n</i></b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>F</i></b>	<b><i>p</i></b>
Autonomy					
Meet Recommendations	108	10.35	2.78	1.042	0.309
Do Not Meet Recommendations	40	10.87	2.71		
Competence					
Meet Recommendations	108	10.96	2.91	15.38	0.001**
Do Not Meet Recommendations	40	13.1	3.01		
Relateded					
Meet Recommendations	108	9.7	2.94	0.65	0.421
Do Not Meet Recommendations	40	10.15	2.64		
Support					
Meet Recommendations	108	15.08	5.8	1.68	0.196
Do Not Meet Recommendations	40	16.4	4.32		
Resources					
Meet Recommendations	108	4.54	2.77	4.85	0.029*
Do Not Meet Recommendations	40	5.7	2.98		

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

A regression analysis measured the influence of the five constructs (autonomy, competence, relatedness, support, and resources) on teaching experience, class size, and meeting the PE recommended teaching minutes among study participants. The total regression model was significant among teachers meeting recommended teaching minutes, explaining 15.4% of the total variance,  $F(5, 148) = 5.172$ ,  $p = 0.0001$ . Standardized coefficients indicated that competence ( $p = 0.01$ ) has a statistically significant influence on teachers meeting the recommended PE minutes. Further, constructs used in this study were found to be statistically influential among teachers based on experience,  $F(5, 148) = 2.72$ ,  $p = 0.022$ ,  $R^2 = .087$ . Standardized coefficients report competence ( $\beta = -.28$ ,  $p = 0.05$ ) had a significant effect on PE teachers. See Table 3 for regression data.

**Table 3**

*Regression Analysis Between Autonomy, Competence, Relatedness, Support, and Resources Among Teachers Meeting PE Teaching Minutes, Teaching Experience, and Class Size*

Motivation construct	Meeting recommended								
	PE minutes			Teacher experience			Class size		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Constant	0.69	0.217		3.042	0.826		2.293	0.453	
Autonomy	-0.035	0.019	-0.218	0.117	0.071	0.199	0.09	0.039	0.285**
Competence	0.07	0.017	0.482**	-0.149	0.064	-0.282	-0.037	0.035	-0.131
Relatedness	-0.007	0.016	-0.046	0.042	0.06	0.074	-0.034	0.033	-0.112
Support	0.01	0.007	0.128	0.016	0.026	0.053	-0.012	0.014	-0.074
Resources	0.011	0.013	0.072	-0.107	0.05	-0.187	0.019	0.028	0.064
<i>F</i>			5.172*			2.72*			1.519
<i>R</i> <sup>2</sup>			0.154			0.087			0.51
Adjusted <i>R</i> <sup>2</sup>			0.124			0.055			0.017
<i>p</i>			0.0001			0.022			0.186

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

## Discussion

This study found the majority of participants worked in a school that met the recommended weekly PE minutes and teachers who work in schools that met the recommended weekly PE minutes are more competent. However, teachers who worked in schools that did not meet the recommended weekly PE minutes felt that there was a lack of resources at their schools and were less competent in their abilities to implement PE courses. For the purpose of this discussion, the resources included in this study included equipment, funding, and technology.

The state where this study took place requires PE to be taught in every grade, but it does not require schools to meet the recommended weekly PE minutes (SHAPE America et al., 2016). It has been found that school-aged youth are not necessarily receiving adequate time in PE and researchers have explained that schools can be ideal places to help increase overall childhood PA (Institute of Medicine, 2013; NPAP, 2016; Pate et al., 2006). The researchers were surprised that the majority of participants in this study worked in schools that met the recommended weekly PE minutes, since it is not required by the state. Meeting the recommended weekly PE minutes can help combat the growing rate of overweight and obesity among children, as well as make PE teachers feel more competent in their ability to teach an effective PE class.

Teachers who work at schools that do not meet the recommended weekly PE minutes feel less competent. This makes sense because competence is a person's beliefs about his or her ability to teach an effective PE course. If teachers are not given the proper amount of time to teach the necessary content, they will not believe they are teaching a course that is effective. A lack of resources also contributes to a teacher's feeling of competence. If teachers do not have the proper equipment, funding, or technology, they most likely believe that their students are not getting the best lesson plan or PE course. Daniels (2017) found that teachers who have the proper elements in their curriculum are encouraged to become more effective and motivated when teaching. In PE, as well as other subjects, equipment and time are the most important elements in the curriculum to support a teacher's lesson plans. It is not surprising that participants in this study felt less competent and did not have enough resources to

implement PE if they reported working at a school that did not meet the recommended weekly PE minutes.

Deci and Ryan (2000) explained that autonomy, competence, and relatedness are important for motivation. It has been found that the more teachers' basic psychological needs are met, the more self-determined they are to provide students with adequate help and support (Taylor, Ntoumanis, & Standage, 2008). Skaalvik and Skaalvik (2014) explained the relationship with autonomy and job satisfaction in teachers. They found that PE teachers need the proper resources and time to feel competent in their job. Taylor et al. (2008) interviewed PE teachers and found that time constraints, along with other factors, affected the teacher's implementation of an effective lesson plan. Teachers might work in a school that allows them the freedom (autonomy) to develop their lessons, but they still will not feel competent in their lesson plan if they do not have the proper amount of time and resources to teach it effectively.

## **Limitations**

This study was reliant on self-reported responses concerning recommended weekly PE minutes and participants' motivation at work. Another important limitation was location. Surveys were only distributed to participants at one Midwestern state conference. Last, potential socially desirable responses could be a limitation if a participant felt uncomfortable reporting low levels of motivation.

## **Conclusion**

Meeting the recommended weekly PE minutes can help reduce the childhood overweight and obesity issues in the United States. It was reassuring to find that most participants in this study worked for a school that met this requirement. However, in schools that do not meet this requirement, the students and PE teachers suffer. Research has confirmed the importance of having all three basic psychological needs met in the work environment for employees to be the most effective. This study is an example of how competence is affected when PE teachers work in schools that do not meet the recommended weekly PE minutes. Teachers who feel they do not have the proper amount of time or resources necessary to teach an effective PE class could potentially lose the motivation to implement an effective PE class.

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