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Testing the Vallerand's Motivational Sequence in Physical Education: The Invariance of Teachers' Motivation to Teach

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Abstract

The aims of this study were to test the Vallerand's motivational sequence model in physical education and to examine the invariance of the model across PE teachers‟ motivation to teach. The study was conducted with 177 high school PE teachers and their 461 students. Motivation to Teach Scale was applied to PE teachers. "Highly intrinsically motivated" and "highly extrinsically motivated" teachers were determined based on the results obtained from this scale. Two highest intrinsically motivated teachers and three highest extrinsically motivated teachers were reached again and their students‟ autonomy support, basic psychological needs satisfaction, situational motivation, subjective vitality, and concentration were assessed. Structural equation modelling and Ward invariant analysis were used for the data analysis. Results showed that the more teachers are intrinsically motivated for her profession, the more their students‟ autonomy need satisfaction negatively explains their amotivation level in physical education. Perceived autonomy support is the trigger and autonomy need satisfaction is the most important variable in the whole motivational model. Thus, physical education teachers are recommended to create a lesson environment providing autonomy support and considering autonomy need satisfaction to increase students‟ well-being.

Key words: Autonomy support, Basic psychological needs, Student motivation, Teacher motivation, Well-being

Introduction

Self-determination Theory (SDT; Deci & Ryan, 1985) has been extensively explored to predict various cognitive, affective, and behavioral outcomes in school physical education (PE) (Ntoumanis & Standage, 2009). SDT makes a distinction between different explanations for an action or inaction. Various forms of motivation were proposed to compensate for driven behavior, including intrinsic motivation, extrinsic motivation, and amotivation (Standage et al., 2006). According to SDT, intrinsic motivation is identified by behavior for the pleasure, value, and fulfillment of the task itself. For example, because of feelings of fulfillment and enjoyment that result directly from the activities offered by the PE program, an intrinsically motivated student will engage in PE. Extrinsic motivation, on the other hand, involves behaviors carried out for purposes other than an inherent interest in the task (performing an activity is directed by a separable threat, reward, or punishment (Deci & Ryan, 1985). For example, an extrinsically motivated student would participate PE because of a fear of failing the class or getting low grade.

SDT defines four different types of extrinsic motivation which differ in degree of self-determination. The lowest degree of self-determination corresponds external regulation which means the behaviors taken to receive an external reward and/or to avoid any kind of penalty. Introjected regulation is a type of extrinsic motivation defined by the internalization of external regulations. Identified regulation refers to human identification with an activity that is central to one's goals (Ryan & Deci, 2002). The highest degree of self-determination corresponds integrated regulation applies to identifications that were embedded into the self and in line with individuals' certain values and needs (Ryan & Deci, 2000a; Standage et al., 2006). Lastly, amotivation is the lack of motivation, more specifically a belief that an action is unimportant and/or that a person does not consider contingencies between his/her actions and the intended outcomes (Ryan & Deci, 2002).

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Vallerand (1997) proposed a hierarchical model within SDT, which social factors (i.e. autonomy support) effect psychological mediators; which in turn effect motivation; which finally effects consequence variables (Figure 1). This provides a framework for not only identifying motivational factors, but also analyzing the affect these have on intrinsic motivation, extrinsic motivation and amotivation. The framework also provides for the examination of the consequences of different types of motivation.

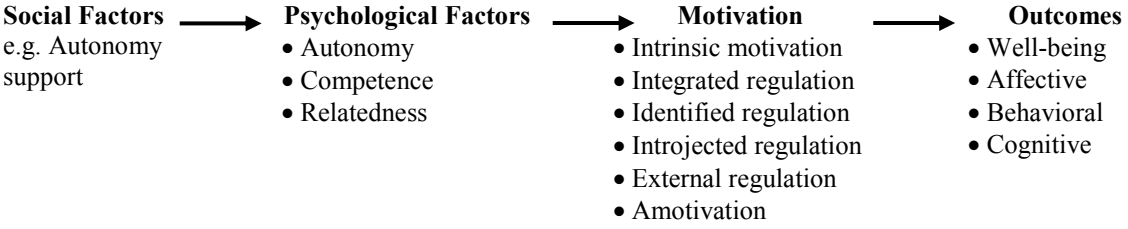

Figure 1. Vallerand‟s hierarchical model of motivation

In Vallerand‟s (1997) motivational sequence model antecedent of psychological mediators is teacher created autonomy support. Autonomy-supportive behavior includes having adopted one's own views and emotions, providing rationale, decision to make and encouraging self-sponsored activity (Jang et al., 2010). It is known that teachers‟ support of the students‟ autonomy in a learning environment foster students‟ basic psychological needs (e.g. Reeve, 2009). To be more specific, these are autonomy, competence, and relatedness needs.

According to SDT, the need for autonomy refers to experiencing a sense of psychological freedom, feelings of volition vitality, and initiative (Deci & Ryan, 1985), the need for competence refers to feeling capable to achieve success (Deci & Ryan, 1985), and relatedness refers to experiencing meaningful connections with the others (Ryan & Deci, 2000b). SDT implies that the fulfilling of these three psychological requirements are important for integrity, progress, positive functioning and well-being in all domains and developmental cycles but when these are not met, various maladaptive outcomes, such as anxiety, anger and such negative emotions occur (Ryan & Deci, 2000b). Previous research within the framework of SDT reveals that when teachers are autonomy supportive versus controlling has a direct effect on students‟ intrinsic motivation (Reeve, Bolt, & Cai, 1999; Guay, Boggiano & Vallerand, 2001) and indirect effect on outcome variables such as students‟ autonomous self-regulation (Reeve et al., 1999).

Teacher's Motivation to Teach

SDT notes that teachers who are intrinsically motivated to teach find the teaching extremely rewarding, and they are enthusiastic and dedicated to teaching (Fernet et al., 2016). On the other hand, teachers who are extrinsically motivated put energy into their teaching whether it is what is requested of them or whether they sense an intrinsic urge to do so, with the commitment in teaching becoming practical in order to escape feelings of shame or to enhance their self-worth (Niemiec & Ryan, 2009). When teachers have amotivation for teaching, their intention to teach is absent, either because teachers do not feel capable to teach or because they do not value the teaching (Ryan & Deci, 2002).

In a study by Tilga et al., (2020), it was found that the effect of PE teachers‟ autonomy supportive behavior on students‟ intrinsic motivation was partially mediated by basic psychological need satisfaction. That is, higher levels of controlling behavior minimize the indirect impact of perceived autonomy supportive behavior on intrinsic motivation by fulfilling basic psychological needs. Students can experience PE teacher‟s autonomy supportive behaviors that has shown to enhance students‟ psychological needs, which, in turn, predicts self-determined motivate on and adaptive outcomes (e.g. De Meyer et al., 2014; Haerens et al., 2015).

The Role of Teacher's Motivation in Vallerand's Motivational Sequence

Previous work has found that teachers who were intrinsically motivated to teach were more inclined to promote student autonomy, and this in effect, contributed to an improvement in students‟ intrinsic motivation. For example, Roth, et al. (2007) found that elementary school teachers‟ autonomous motivation for teaching increased students‟ autonomous motivation for learning by enhancing teachers‟ autonomy-supportive behavior. In a similar vein Pelletier, Seguin-Levesque and Legault (2002) conducted a study with primary, elementary,

and high school students and found that the less teachers were self-determined toward teaching, the more they became controlling with students. In project-based learning environment when teachers indicated higher intrinsic motivation, their secondary school students appeared to gain more support from them and to express higher intrinsic motivations for learning experience (Lam et al., 2009).

Studies with undergraduate students replicates the findings with elementary students. Namely, Wild et al. (1997) have found that undergraduate students who have been taught by an extrinsically motivated teacher have demonstrated reduced interest in learning and less enjoyment of the task than those taught by an intrinsically motivated teacher. In addition, when these students were asked to act as teachers, their students reported lower levels of interest, enjoyment of task, and positive mood. Similarly, Wild and Hawkins (1992) stated that volunteer teachers‟ undergraduate students were more intrinsically motivated to learn playing the piano, enjoyed piano lesson more and had greater desire to play piano following the lesson compared to the students whose teachers were paid. Moreover, students in volunteer teaching condition engaged more in new exploration after the piano lesson. Another research with college students revealed that students who considered their teachers to be enthusiast consequently registered greater inner enthusiasm for teaching materials and exhibited higher degrees of vitality (Patrick et al., 2000).

Roth et al (2007) argued three processes that explain autonomous motivation to teach might lead to autonomy-supportive teaching. Firstly, teachers who have autonomous motivation gained a broad knowledge of the importance of the methods they use and the content they teach, and offer persuasive descriptions and examples to their students of the relevance of those subjects and their teaching methods. Knowing that the students have many different ways to learn allow teachers to offer their students some choice. The second process is related to teachers‟ experience of motivation and its benefits. Teachers who have witnessed the benefits of autonomous motivation recommend that their students often behave and learn from autonomous motivations, as they recognize that these forms of incentives contribute to good quality performance and greater understanding of the topics they teach and enjoy. Autonomously motivated teachers then use their own motivational experiences as a basis for inferring that if the students understood the value of the subject being learned and found it interesting, they would engage in learning in the most serious way. Lastly, greater resistance of autonomous teachers to performance demands and questions regarding making perceptions, and greater engagement by these teachers in high quality learning. Teachers who are more autonomously motivated are more likely to give any option to take the time to explain the importance of various subjects as they are less pressed to deliver fast to spectacular formal successes, and are more concerned with fostering a thorough comprehension of the subjects they teach.

Present Study

According to Niemiec and Ryan (2009), teachers‟ motivation to teach might act as an energy supplier. Previous studies have some evidence related to teachers‟ motivation to teach may affect student variables in Vallerand‟s (1997) model. Teachers‟ autonomous motivation to teach was hypothesized to lead to autonomy-supportive teaching, in parallel with that extrinsic motivation to teach may decreases the autonomy supportive teaching (e.g. Roth et al., 2007). It was also hypothesized that creating need supportive learning environment differs according to the teachers‟ motivation to teach. Because autonomously motivated teachers engage more in their teaching planning by aligning course resources with students' desires and values, they are more open to students' feedback and viewpoints while teaching, they express their goals more clearly, they offer more guidance, and they provide more help and encouragement (Vermote et al, 2020). According to the evidence for the effect of teachers‟ motivation for teaching on students‟ motivation for learning (e.g. Lam et al., 2009), students of PE teachers that intrinsically motivated to teach were hypothesized to have higher levels of intrinsic motivation compared to students whose PE teachers were extrinsically motivated to teach. To sum up, it was hypothesized that PE teachers who were externally motivated were more controlling, create a learning environment that frustrate students‟ basic psychological needs, foster students‟ extrinsic regulation, amotivation and undermine students‟ concentration and vitality than teachers who were more intrinsically motivated to teach.

Yet, to our knowledge, there is no published evidence testing that whether Vallerand‟s (1997) full model changed according to the teachers‟ motivation to teach. Therefore, the aim of this study was twofold: firstly, to test the complete sequence of Vallerand's (1997) model in PE, secondly to examine the invariance of the model across PE teachers‟ motivation to teach. Hypothesized model is shown in Figure 2.

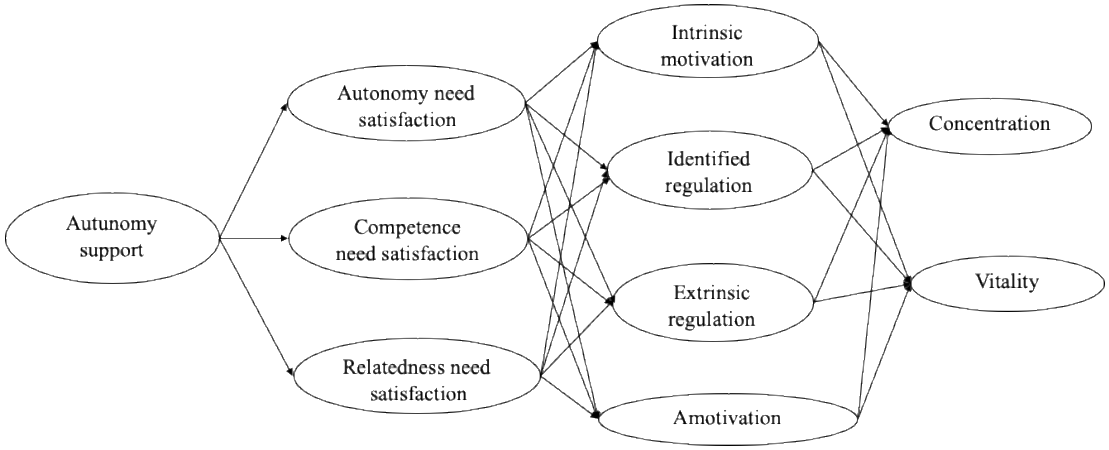

Figure 2. Hypothesized model

Methods

This study is cross-sectional and correlational.

Participants

The study was conducted with 177 PE teachers (39 females, 138 males; M_{age} = 40.57 ± 7.48 years) working in 87 different high schools and 461 high school students (253 females, 208 males; M_{age} = 15.65 ± 0.96 years) in central province of southern city in Turkey. Motivation to Teach Scale was administered to PE teachers. Then, they were divided into two categories as "highly intrinsically motivated to teach" and "highly extrinsically motivated to teach" based on the results obtained from Motivation to Teach Scale. The researcher met the highest intrinsically motivated two PE teachers and the highest extrinsically motivated three PE teachers. Three classes of each teacher were randomly selected. Student questionnaire pack was administered to all students in each selected class.

Instruments

Motivation to Teach Scale
Kauffman, Yılmaz-Soylu and Duke (2011) developed the scale Güzel Candan and Evin Gencel (2015) translated it into Turkish. The scale consists of two subscales, namely intrinsic and extrinsic motivation. Totally 12 items are rated in a 6-point Likert scale. CFA was done for the validity of the Turkish data with the scale and results were satisfactory (X^2/df=4.25; RMSEA=0.08; SRMR=0.04; CFI=0.93; NFI=0.91; p=0.001).

Perceived Autonomy Support Scale for Exercise Settings
Hagger et al. (2007) developed the scale and and Müftüler (2016) translated it into Turkish. The scale has one dimension and 12 items measured on 7-point Likert scale. In this study confirmatory factor analysis (CFA) was performed and results revealed a valid scale for PE setting (X^2/df=4.22; RMSEA=0.07; SRMR=0.04; CFI= 0.93; NFI=0.91; p=0.001).

Basic Psychological Needs Scale
Deci and Ryan (1991) developed the scale and Cihangir-Çankaya and Bacanlı (2003) translated it into Turkish. The scale has three subscales; autonomy, competence and relatedness subscales. Students indicated totally 21 items the extent to which they agreed with each response using a 7-point scale. CFA were done in this study and it showed that the scale revealed a valid structure (X^2/df=4.62; RMSEA=0.10; SRMR=0.09; CFI= 0.55; NFI=0.51; p=0.001).

Situational Motivation Scale
Guay et al., (2000) developed the scale and Daşdan Ada et al. (2012) translated it into Turkish. It has intrinsic motivation, identified regulation, extrinsic regulation and amotivation subscales. Students indicated 16 items the extent to which they agreed with each response using a 7-point scale. CFA results showed that the scale revealed a valid structure (X^2/df=4; RMSEA=0.08; SRMR=0.07; CFI= 0.90; NFI= 0.87; p=0.001; Erturan-İlker et al., 2018).

Subjective Vitality Scale
Ryan and Frederick (1997) developed the scale and Erturan-İlker et al. (2018) translated it into Turkish. The scale has one-dimension and seven items measured on 7-point Likert. CFA results showed that the scale revealed a valid structure (X^2/df=4.41; RMSEA=0.09; SRMR=0.05; CFI= 0.94; NFI= 0.93; p=0.001).

Concentration in PE Scale
Standage et al (2005) developed the scale and Erturan-İlker et al. (2018) translated it into Turkish. The scale has one-dimension and six items measured on 5-point Likert. CFA results showed that the scale revealed a valid structure (X^2/df=4.9; RMSEA=0.09; SRMR=0.04; CFI= 0.96; NFI= 0.95; p=0.001).

Procedures

The population of high school PE teachers in data collection province was 195. Six teachers did not volunteer to participate and 12 teachers were on annual leave or out of school due to the health problems. So, totally 177 high school PE teachers were determined as the sample of the study. After getting permissions from Ministry of National Education, PE teachers were met at their schools and consent forms were given. One week after consent forms were given, Motivation to Teach Scale was applied while teachers had no lesson during the school time.

The data obtained from the Motivation to Teach Scale was analyzed and two highest intrinsically and two highest extrinsically motivated teachers were determined. Because two teachers had the same extrinsic motivation mean value, both of them were taken and consequently, two intrinsically and three extrinsically motivated PE teachers were included to the study. The researcher met again with these teachers individually during their free time at the school and three classes of each PE teacher were randomly selected. The following week, student and parent consent forms were distributed to all students in those classes during their scheduled PE lessons. One week after the consent forms were delivered, the student questionnaire pack was administered during their scheduled PE lessons to the students who were volunteer to participate to this study. PE teachers were not present during the data collection, students were explained that their participation was anonymous, they were free to withdraw from the study in any time, the data would only be used for research purposes and will not be shared by the others.

Data Analysis

Firstly, CFA was done for each scale of the study using AMOS Version 5.0 (Arbuckle, 2003). Standard error estimations were made by Bootstrapping technique. Descriptive analysis and Pearson correlation among variables were calculated using SPSS Statistics for Windows, Version 16.0 (IBM Corp., 2007). Then, hypothesized model was tested for the whole group using AMOS 5.0 (Arbuckle, 2003) and lastly it was tested for both samples individually with using Ward analysis. Table 1 shows the acceptable model fit indices.

Results

Normality of the study variables, Cronbach˝s alpha reliability scores for each subscale and descriptive values for each variable were calculated. Descriptive analysis, reliability and normality scores are given in Table 1.

Table 1. Descriptive data and Cronbach˝s alpha values of the study variables

Variables	Min	Max	α	M	SD	Skewness	Kurtosis
Autonomy support	1.25	7.00	0.72	5.72	1.24	-1.043	1.464
Autonomy need satisfaction	1.83	7.00	0.79	5.11	1.00	-.220	-.284
Competence need satisfaction	2.00	7.00	0.82	4.77	0.96	.044	-.398
Relatedness need satisfaction	2.67	7.00	0.83	5.39	0.97	-.476	-.333
Intrinsic motivation	1.25	7.00	0.88	5.72	1.26	-1.161	1.216
Identified regulation	1.00	7.00	0.75	5.59	1.36	-1.084	.493

Extrinsic regulation	1.00	7.00	0.78	3.91	1.70	.076	-1.071
Amotivation	.73	7.00	0.89	3.07	1.64	.517	-.675
Vitality	1.00	7.00	0.96	4.99	1.23	-.578	.019
Concentration	1.67	5.00	0.94	3.70	0.60	-.703	.230

Table 1 shows that all the subscales had internal consistency (i.e. >0.70) and data was normally distributed. Pearson correlation analysis was computed to see the relations among the study variables. Table 2 shows the correlation among the variables.

Table 2. Correlation coefficients for all variables included in the study

	1	2	3	4	5	6	7	8	9
1.Autonomy support	-								
2.Autonomy need satisfaction	.274**	-							
3. Competence need satisfaction	.193**	.483**	-						
4. Relatedness need satisfaction	.352**	.528**	.465**	-					
5. Concentration	.390**	.239**	.342**	.312**	-				
6. Vitality	.295**	.278**	.369**	.388**	.400**	-			
7.Intrinsic motivation	.375**	.102*	.122**	.186**	.401**	.304**	-		
8.Identified regulation	.399**	.117*	.151**	.155**	.427**	.330**	.759**	-	
9.Extrinsic regulation	-.143**	-.151**	-.129**	-.108*	-.242**	-.105*	-.204**	-.184**	-
10. Amotivation	-.269**	-.311**	-.230**	-.284**	-.341**	-.206**	-.256**	-.253**	.594**

*p<.05 **p<.01

The findings obtained from Pearson correlation analysis were supported the theoretical tenets of SDT. Namely, autonomy support and satisfaction of all three basic psychological needs positively correlated with each other, intrinsic motivation, identified regulation, concentration and vitality, while negatively correlated with extrinsic motivation and amotivation. Identified regulation and intrinsic motivation positively correlated with each other, concentration, and vitality, while negatively correlated with extrinsic motivation and amotivation. In a similar vein, extrinsic motivation and amotivation had a positive relation with each other but had negative correlations with all other variables in the study.

Table 3. Model fit indices

Model Fit Indices	Model	Acceptable Fit
X^2/df	1.85	$0 < X^2/df < 5$
CFI	0.91	$0.90 \leq CFI \leq 1.0$
NFI	0.89	$0.90 \leq NFI \leq 1.0$
RMSEA	0.05	$0.00 \leq RMSEA \leq 0.10$
SRMR	0.09	$0.00 \leq SRMR \leq 0.10$

Table 3 shows that the data has acceptable fit with the model. Figure 3 shows the final model obtained from the data.

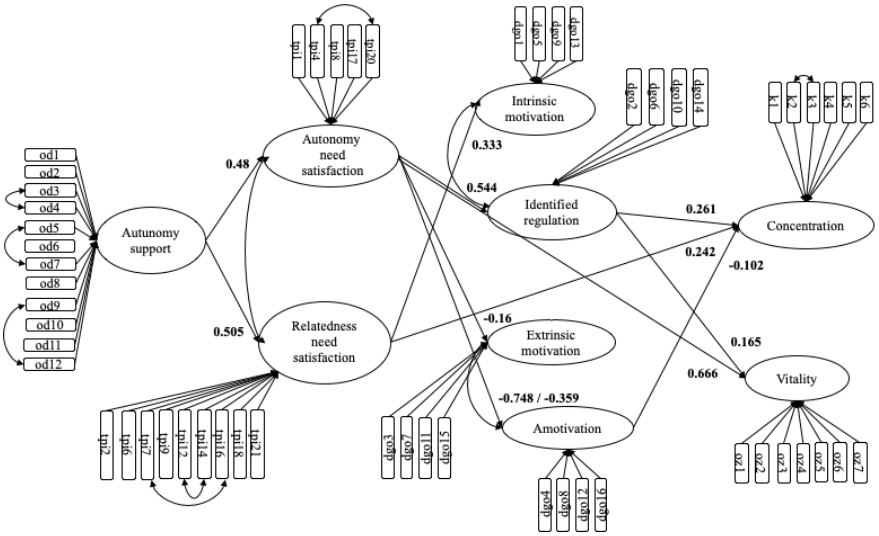

Figure 3. Final model

Note: All the shown paths are significant (p<.001)

Final model supported the motivational sequence that Vallerand (1997) proposed. Perceived autonomy support positively predicted students‟ autonomy and relatedness need satisfaction. Autonomy need satisfaction positively predicted identified regulation and vitality, while negatively predicted extrinsic motivation and amotivation. Relatedness need satisfaction positively predicted intrinsic motivation and concentration. Identified regulation positively predicted concentration and vitality and lastly, amotivation negatively predicted concentration. Table 4 shows the indirect effects among variables.

Table 4. Indirect effects of the model

rhs	est	se	z	p
Autonomy support*autonomy need*identified regulation	0.261	0.027	9.773	<0.001
Autonomy support*autonomy need*vitality	0.319	0.038	8.392	<0.001
Autonomy support*autonomy need*identified regulation*concentration	0.068	0.009	7.204	<0.001
Autonomy support*relatedness need*intrinsic motivation	0.168	0.021	7.879	<0.001
Autonomy support*relatedness need*concentration	0.122	0.022	5.436	<0.001
Autonomy need*identified regulation*concentration	0.142	0.022	6.352	<0.001
Autonomy need*identified regulation*vitality	0.09	0.027	3.366	0.001
Autonomy need*identified regulation*vitality + Autonomy need*vitality	0.755	0.08	9.476	<0.001

To test indirect relationships in this model, variables that serves as fully and partially mediator were determined. Basically, three mediators were defined; autonomy need satisfaction, relatedness need satisfaction and identified regulation. Autonomy need satisfaction which fully mediated relationships between the autonomy support and identified regulation; autonomy support and vitality; autonomy support, autonomy need satisfaction, identified regulation and concentration. Second mediator, relatedness need satisfaction fully mediated the relationships between autonomy support and intrinsic motivation; autonomy support and concentration. Last mediator, identified regulation fully mediated the relations between autonomy need satisfaction and concentration; autonomy need satisfaction and vitality; while it partially mediated the relationship between autonomy need satisfaction and vitality.

To test whether Vallerand‟s (1997) model on students‟ invariant across PE teachers‟ motivation to teach, Ward analysis was used, that is shown in Table 5.

Table 5. Ward analysis results

	Model 1	Model 2	Model 3
Df	2908	2898	2909
AIC	92039.98	92038.62	92045.22
Chisq	5381.17	5359.803	5388.403
CFI	0.81	0.8	0.8
NNFI	0.8	0.79	0.79
SRMR	0.093	0.094	0.094
RMSEA	0.052	0.052	0.052
Chisq diff		16.603	4.7
Df diff		10	1
p (>Chisq)		0.084	0.03

Note:
M1: It assumes that all regression parameters are same except f1.
M2: It assumes that all regression parameters are different.
M3: It assumes that all regression parameters are same.

Firstly, M1 and M2 were compared to see whether different regression parameters were required across motivation groups. Since M2 was significant (p = 0.084), it was concluded that those two models did not differ. We can at least keep the other parameters same across the two groups except the link between autonomy need and amotivation. Secondly, M1 and M3 were compared to see whether same regression parameters could be used across motivation groups. With the p value since M3 was significant (p=0.03), it was concluded that those two models differ, and we could not use the same parameter for at least the link between autonomy need and amotivation. As a result, parameter of the link between autonomy need and amotivation could not be same for both motivation groups. Although most parameters were same, two models were not identical.

The results of Ward analysis revealed that this model showed partial invariance between students whose teachers had high intrinsic motivation to teach and students whose teachers had high extrinsic motivation to teach. The only distinctive relationship in the model was between the autonomy need satisfaction and amotivation. Namely, if the PE teacher was intrinsically motivated to the profession, the level of students‟ perceived autonomy support negatively predicted amotivation was increased.

Discussion

In the current study, we add to the existing literature by testing a Vallerand‟s (1997) model based on SDT to investigate the processes by which autonomy-supportive lesson created by teachers influence students‟ basic psychological needs, which in turn predicted motivational regulations, which lead to concentration and vitality in Turkish PE environment. Study results proved that the students' level of perceived autonomy support in PE satisfies the students' need for autonomy and relatedness, increases students' identified regulation and intrinsic motivation, decreases the external regulation and amotivation, and accordingly, increases the psychological well-being (i.e. concentration and vitality) respectively. This information enables PE teachers to understand how to develop a more adaptive learning environment to promote adolescents‟ basic psychological needs, self-determined motivation, and optimal functioning in high school compulsory PE setting.

In this study three mediators, autonomy need satisfaction, relatedness need satisfaction and identified regulation fully and partially mediates various relationships. Examining these relationships in depth can make the model easier to understand. First mediator is autonomy need satisfaction which fully mediates the relationship between the autonomy support and identified regulation; autonomy support and vitality; while partially mediates the relationship between the autonomy support, identified regulation and concentration. In other words, students‟ autonomy need satisfaction in PE predicts psychological (i.e. vitality) and mental (i.e. concentration) well-being.

Second mediator the only motivational regulation that is serve as a bridge between basic psychological needs and both outcome variables (i.e. vitality and concentration) in this study is identified regulation. Identified regulation is the individual's participation in the activity on the grounds of a belief of behavior is important and contributes to one‟s personal development (Ryan & Deci, 2000a). Some students, for example, may engage in PE because they appreciate the significance of exercise for their health (Ntoumanis, 2005). Although identified regulation represents the behavior performed in order to achieve personal goals, not for its own sake, it represents fully integrated and self-determined forms of behavior (Deci & Ryan, 1991). That is to say with identified regulation, one‟s action is more self-determined. When describing an operation as relevant to personal

objectives, the individual makes more decisions about his or her engagement than when new and additional regulatory models are in effect (Ntoumanis, 2001). Therefore, the development of identified regulation seems important. To enhance students‟ identified regulation for PE, teachers can emphasize the link between physical activity and health, so that students can understand the importance of the lesson for their health and well-being in their future life. In their study Ulstad, Halvari, and Deci (2019) proved the link between teachers‟ perceptions about students‟ identified regulation and students‟ actual level of identified regulation. The ability of seeing the signals of students‟ identified regulation enabled them to give optimal teaching. Therefore, teachers are also recommended to

Third and last mediator in this model is relatedness need satisfaction. Students‟ relatedness need satisfaction in PE fully mediates the relationship between perceived autonomy support and intrinsic motivation. Relatedness is essential for growth and well-being (Ryan & Deci, 2000b; Holt et al., 2019). The structure of the PE lessons contains cooperative activities allowing stronger feelings of relatedness among students (Ntoumanis, 2001). Vasconcellos et al. (2020) argued that relatedness in PE is associated with both peer and teacher influences.

In a similar vein students‟ relatedness need satisfaction in PE fully mediates the relationship between perceived autonomy support and concentration as a well-being parameter. As most work has shown that positive interactions and feelings of relatedness are linked to psychological well-being (e.g., La Guardia et al., 2000). Vallerand and Losier (1999) proposed cooperation make an activity inherently more interesting which promotes students‟ intrinsic motivation toward the activity. Therefore, teachers are recommended to promote the communication among students, use a positive language and show interest to their students to foster relatedness need satisfaction.

Students who perceived an autonomy supporting PE environment experienced greater levels of autonomy and relatedness need satisfaction. However, the results revealed that the competence need satisfaction was not predicted by perceived autonomy support or any other variable in the model. This result is surprising, because PE lessons are the environments that contain virtually all members of an age cohort with quite discrepant physical ability levels (Ntoumanis, 2005). Due to the nature of PE lessons, all students exhibit the requirements of the lesson, mostly psychomotor skills, in front of their other friends and PE teacher. That is, perception of competence is very significant in PE, as differences in the degree of physical capacity can be easily detected. Therefore, it is possible that even children who feel and are physically capable will consider PE enjoyable and fun and may continue to take part in it and help improve their athletic abilities (Ntoumanis, 2002; 2005). Similarly, Goudas and Biddle (1994) found that students‟ perceived competence in PE explained a significant amount of variance in intrinsic motivation scores of British PE students.

The fact that need for competence is not explained by any variable in the SEM model in this study is surprising due to its vital importance in PE lessons. However, Reis et al. (2000)'s point is also important, they claimed that all three basic psychological needs does make an independent contribution to the prediction of daily well-being. Moreover, existing knowledge both in sport (e.g. Blanchard & Vallerand, 1996) and PE contexts (e.g. Standage & Duda, 2005; Zhang et al., 2011; Behzadnia et al., 2018) showed through a path analysis that all three basic psychological needs mediated the relationship between autonomy support and situational self-determined motivation.

Second aim of this study was to test whether Vallerand‟s (1997) model was invariant across PE teachers‟ different motivational regulations to teach. We hypothesized that teachers whether having intrinsic or extrinsic motivation to teach would affect students‟ perceived autonomy support, basic psychological needs, motivational regulations for learning, subjective vitality, and concentration differently in PE. However, this study proved that Vallerand (1997)‟s sequence of motivational process works similar for highly intrinsically motivated teachers‟ and highly extrinsically motivated teachers‟ students. In other words, the PE teachers saying “I can‟t imagine a job other than teaching” creates similar learning environment for their students with the teachers saying “I prefer to be a teacher because it is easy to find a job” in terms of Vallerand‟s (1997) motivational sequence.

The only difference between two models was the relationship between the autonomy need satisfaction and amotivation. The students whose PE teachers were highly intrinsically motivated to teach, have higher level of predictive level of autonomy need satisfaction for amotivation. That is to say, the more PE teachers are intrinsically motivated for their profession, the more their students‟ autonomy need satisfaction negatively explains their amotivation level in PE.

Neşe (2018) stated that Turkish teachers were motivated with intrinsic and extrinsic factors such as being successful, effective working condition, students' desire for learning, being more autonomous, equitable and consistent implementations regarding with project-based education approach. Existing literature has evidence for how teachers‟ intrinsic and extrinsic motivation could either directly affect their teaching behaviors or

mediate the effect between contextual factors and teaching behaviors. For example, Vermote et al. (2020) argued that autonomously motivated teachers are likely to have more energy at their disposal, contributing to their alertness and psychological availability in teaching, thus providing maximum support for students' psychological needs. Presumably, since teaching needs so much work on the part of managed motivated teachers, they have little ability to adapt their point of view to their students' experiences, using more harsh language and aggressive tactics as they encounter opposition, and ultimately give up on students who refuse to agree or who do not make enough progress.

Fernet et al. (2016) found that early career middle and high school teachers‟ autonomous motivation positively predicts behaviors related to fostering student attentiveness in the classroom. Conversely, teachers‟ controlled motivation negatively predicts student attentiveness. Pelletier, Seguin-Levesque and Legault (2002) found that the more teachers perceive pressure from above (they have to comply with a curriculum, with colleagues, and with performance standards) and pressure from below (they perceived their students to be non-self-determined), the less they are self-determined toward teaching.

Autonomy support is the trigger of the whole motivational model. It is not possible for any of the psychological effects in this motivational model to occur without teachers‟ autonomy support. Thus, PE teachers are recommended to create a PE environment to provide autonomy support to increase the well-being of their students. Reeve and Cheon (2016) identified six strategies for PE teachers to create autonomy supportive environment; taking the perspective of their students; introducing activities that vitalize and support the psychological needs; providing explanatory rationales for their requests; communicating using informational language; acknowledging and accepting expressions of negative affect; and displaying patience. Similarly, Tilga (2019) elaborated the autonomy supportive strategies for teachers in PE as allowing students to choose their sports equipment, accepting students‟ solutions in learning exercises, allowing students to express their own opinions, providing responses to students when they express their opinion, explaining the effect of exercise on health, guiding students toward finding solutions to problems without directly revealing the answer.

Limitations and Future Directions

This study has a couple of limitations. Firstly, only teachers who have high level of intrinsic motivation and extrinsic regulation and their students were recruited for the study. The reason is that only existing scale that assess teachers‟ motivation to teach in Turkish language has two subscales; intrinsic motivation and extrinsic motivation. Therefore, neither teachers who have other types of extrinsic motivation and amotivation nor the teachers who have low level of any type of motivation were included to the study. Future research may consider examining the students‟ motivational process whose teachers have low level of motivation to teach or amotivation.

Secondly, teacher created autonomy support was assessed via students‟ perceptions of autonomy-supportiveness of the lessons. Future studies may use objective observation tools to assess autonomy supportive structure of the PE lessons instead of using self-report questionnaire to ask students about their perception of autonomy support level of the lesson. In addition, qualitative methods such as interviews with students to understand how autonomy supportive is the lesson might give more insight.

Lastly, this study has cross-sectional design. However, it is important to resolve which PE-specific pedagogical approaches, teaching styles, tasks, drills and activities fostering students‟ perceptions of autonomy support and basic psychological need satisfaction. Accordingly, experimental evidence that designate these practices is needed to give PE teachers a shortcut guide.

Despite these limitations, the results of the study are interesting and have a contribution to the literature. To conclude, this study revealed that Vallerand's (1997) full model is acceptable in Turkish PE environment. Furthermore, this model is largely similar among students whose PE teachers are intrinsically motivated to teach and extrinsically motivated to teach. If the teacher is intrinsically motivated for his profession, the autonomy support he provides in the lesson reduces his/her students‟ amotivation level more.

References

Arbuckle, J. L. (2003). Amos (Version 5.0) [Computer Program]. Chicago: IBM SPSS.

Behzadnia, B., Adachi, P. J., Deci, E. L., & Mohammadzadeh, H. (2018). Associations between students' perceptions of physical education teachers' interpersonal styles and students' wellness, knowledge, performance, and intentions to persist at physical activity: A self-determination theory approach. *Psychology of Sport and Exercise*, *39*, 10-19.

Blanchard, C., & Vallerand, R. J. (1996). Perceptions of competence, autonomy, and relatedness as psychological mediators of the social factors-contextual motivation relationship. *Unpublished manuscript. Université du Québec à Montréal*.

Börü, N. (2018). The Factors Affecting Teacher-Motivation. *International Journal of Instruction*, *11*(4), 761-776.

Cihangir-Çankaya, Z., & Bacanlı, H. (2003). Adaptation of the needs satisfaction in general scale. *VII. National Psychological Counseling*.

Daşdan Ada, E. N., Aşçı, F. H., Kazak, Ç. F. Z., & Altıparmak, M. E. (2012). Durumsal Güdülenme Ölçeği"nin (DGÖ) beden eğitimi ders ortamı için geçerlik ve güvenirliği. *Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi*, *10*(1), 7-12.

De Meyer, J., Tallir, I. B., Soenens, B., Vansteenkiste, M., Aelterman, N., Speleers, L., ... Haerens, L. (2014). Does observed controlling teaching behavior relate to students" motivation in physical education? *Journal of Educational Psychology, 106*, 541–554. doi: 10.1037/ a0034399

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality.

Erturan-İlker, G., Quested, E., Appleton, P., & Duda, J. L. (2018). A cross-cultural study testing the universality of basic psychological needs theory across different academic subjects. *Psychology in the Schools*, *55*(4), 350-365.

Fernet, C., Trépanier, S. G., Austin, S., & Levesque-Côté, J. (2016). Committed, inspiring, and healthy teachers: How do school environment and motivational factors facilitate optimal functioning at career start? *Teaching and Teacher Education*, *59*, 481-491.

Goudas, M., & Biddle, S. (1994). Perceived motivational climate and intrinsic motivation in school physical education classes. *European Journal of Psychology of Education, 9*, 241- 250.

Guay, F., Boggiano, A. K., & Vallerand, R. J. (2001). Autonomy support, intrinsic motivation, and perceived competence: Conceptual and empirical linkages. *Personality and Social Psychology Bulletin*, *27*(6), 643-650.

Guay, F., Vallerand, R. J., & Blanchard, C. (2000). On the assessment of situational intrinsic and extrinsic motivation: The Situational Motivation Scale (SIMS). *Motivation and Emotion*, *24*(3), 175-213.

Güzel Candan, D. & Evin Gencel, İ. (2015). Öğretme Motivasyonu Ölçeği"ni Türkçe"ye uyarlama çalışması. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, *36*, 72-89.

Haerens, L., Aelterman, N., Vansteenkiste, M., Soenens, B., & Van Petegem, S. (2015). Do perceived autonomy-supportive and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. *Psychology of Sport and Exercise*, *16*, 26–36. doi: 10.1016/j.psychsport.2014.08.013

Hagger, M. S., Chatzisarantis, N. L., Hein, V., Pihu, M., Soós, I., & Karsai, I. (2007). The perceived autonomy support scale for exercise settings (PASSES): Development, validity, and cross-cultural invariance in young people. *Psychology of Sport and Exercise*, *8*(5), 632-653.

Holt, A. D., Smedegaard, S., Pawlowski, C. S., Skovgaard, T., & Christiansen, L. B. (2019). Pupils" experiences of autonomy, competence and relatedness in „Move for Well-being in Schools": A physical activity intervention. *European Physical Education Review*, *25*(3), 640-658.

IBM Corp. (2007). SPSS for Windows, Version 16.0. Chicago, IL: SPSS Inc. [Computer software]

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*(3), 588–600. doi: 10.1037/a0019682

Kauffman, D. F., Soylu, M. Y., & Duke, B. (2011). Validation of the motivation to teach scale. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *40*(40), 279-290.

La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: a self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of Personality and Social Psychology*, *79*(3), 367.

Lam, S., Cheng, RW., &. Ma, W.Y.K. (2009). Teacher and student intrinsic motivation in project-based learning. *Instructional Science*, 37, 565–578

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, *7*(2), 133-144.

Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, *71*(2), 225-242.

Ntoumanis, N. (2002). Motivational clusters in a sample of British physical education classes. *Psychology of Sport and Exercise*, *3*(3), 177-194.

Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology*, *97*(3), 444.

Ntoumanis, N., & Standage, M. (2009). Motivation in physical education classes: A self-determination theory perspective. *Theory and Research in Education*, *7*(2), 194-202.

Patrick, B.C., Hisley, J. & Kempler, T. (2000). What's Everybody So Excited About? The Effects of Teacher Enthusiasm on Student Intrinsic Motivation and Vitality. *The Journal of Experimental Education*, 68:3, 217-236, DOI: 10.1080/00220970009600093

Pelletier, L., Seguin-Levesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers‟ motivation and teaching behaviours. *Journal of Educational Psychology,* 94, 186–196.

Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educational psychologist*, *44*(3), 159-175.

Reeve, J., Bolt, E., & Cai, Y. (1999). Autonomy-supportive teachers: how they teach and motivate students. *Journal of Educational Psychology*, 9(3), 537–548.

Reeve, J., & Cheon, S. H. (2016). Teachers become more autonomy supportive after they believe it is easy to do. *Psychology of Sport and Exercise*, *22*, 178-189.

Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology*, *75*(3), 411-433.

Standage, M., Duda, J. L. & Ntoumanis, N. (2006) Students' Motivational Processes and Their Relationship to Teacher Ratings in School Physical Education, *Research Quarterly for Exercise and Sport,* 77(1), 100-110, DOI: 10.1080/02701367.2006.10599336

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, 26, 419– 435.

Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: how self-determined teaching may lead to self-determined learning. *Journal of educational psychology*, *99*(4), 761.

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67.

Ryan, R. M. & Deci, E. L. (2000b). The Darker and Brighter Sides of Human Existence: Basic Psychological Needs as a Unifying Concept, *Psychological Inquiry*, 11(4), 319-338, DOI: 10.1207/S15327965PLI1104_03

Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory: An organismic-dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3–33). Rochester, NY: The University of Rochester Press.

Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology*, *75*(3), 411-433.

Standage, M., Duda, J. L., & Ntoumanis, N. (2006). Students' motivational processes and their relationship to teacher ratings in school physical education: A self-determination theory approach. *Research Quarterly for Exercise and Sport*, *77*(1), 100-110.

Tilga, H. (2019). *Effects of perceived autonomy-supportive and controlling behaviour from physical education teachers on students' psychological needs and health-related quality of life* (Doctoral dissertation).

Tilga, H., Kalajas-Tilga, H., Hein, V., Raudsepp, L. & Koka, A. (2020). How teachers‟ controlling behaviour can ruin students‟ intrinsic motivation in a physical education lesson: Test of a conditional process model. *International Journal of Sport Psychology.*

Ulstad, S. O., Halvari, H., & Deci, E. L. (2019). The role of students‟ and teachers‟ ratings of autonomous motivation in a self-determination theory model predicting participation in physical education. *Scandinavian journal of educational research*, *63*(7), 1086-1101.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology: Vol. 29* (pp. 271– 360). New York: Academic Press.

Vallerand, R.J., & Losier, G.F. (1999). An integrative analysis of intrinsic and extrinsic motivation in sport. *Journal of Applied Sport Psychology, 11*, 142- 169.

Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N., Lee, J., Antczak, D., Ntoumanis, N., Ryan, R. M., & Lonsdale, C. (2020). Self-determination theory applied to physical

education: A systematic review and meta-analysis. *Journal of Educational Psychology, 112*(7), 1444–1469. https://doi.org/10.1037/edu0000420

Vermote, B., Aelterman, N., Beyers, W., Aper, L., Buysschaert, F., & Vansteenkiste, M. (2020). The role of teachers" motivation and mindsets in predicting a (de) motivating teaching style in higher education: A circumplex approach. *Motivation and Emotion*, *44*, 270-294.

Wild, T. C., Enzle, M. E., Nix, G., & Deci, E. L. (1997). Perceiving others as intrinsically or extrinsically motivated: Effects on expectancy formation and task engagement. *Personality and Social Psychology Bulletin*, *23*(8), 837-848.

Zhang, T., Solmon, M. A., Kosma, M., Carson, R. L., & Gu, X. (2011). Need support, need satisfaction, intrinsic motivation, and physical activity participation among middle school students. *Journal of Teaching in Physical Education*, *30*(1), 51-68.