

## **An intervention program on motivation and psychological needs in physical education**

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*UN PROGRAMA DE INTERVENCIÓN SOBRE MOTIVACIÓN Y NECESIDADES PSICOLÓGICAS EN EDUCACIÓN FÍSICA*

KEYWORDS: Motivation, basic psychological needs, school physical education.

ABSTRACT: Motivation is a variable that influences the behavior of physical and sports activities promoting positive consequences such as pleasure, fun, and well-being. The objective of this study was to verify the effect of an intervention program on motivation and basic psychological needs (BPN) in School Physical Education. We investigated 42 students from a state public school, divided into two different groups (Control Group (CG) and Intervention Group (IG)). The CG was composed of 18 students and IG by 24 students. Students from both groups answered at the beginning and at the end of the intervention program two different questionnaires (BPNES, PLOCQ). After the initial application of the instruments, a weekly orientation intervention was carried out for 10 weeks only with the IG School Physical Education teacher, who sought to adapt the class in order to bring the students to the BPN (greater autonomy, competence, and social relation). After the intervention, there was a decrease in IG in three factors, with high effects sizes, indicating a high practical significance. The factors that underwent intervention in the IG were: introjected extrinsic motivation, external extrinsic motivation and amotivation. In the CG, no significant change in the variables was observed. We also explored the percentage of variation of the post-test for the pre-test among the variables measured, noting that only in the amotivation variable there was a statistically significant difference between the CG and IG groups after the intervention.

In the last decades, motivation has been the aim of many studies, drawing researchers' interest and expectations in various sports' contexts (Reinboth and Duda, 2006), in exercises (Hagger and Chatzisarantis, 2008). Specifically, in school Physical Education (Ntoumanis 2001; Standage, Duda, and Ntoumanis, 2003), their intention was to contribute to the adoption of a healthy lifestyle by children, creating lifelong habits of physical activities.

Currently, one of the recently most studied motivational theories, the Self-Determination Theory (SDT), explore causes and consequences of self-determined behaviours, that is, how individuals act and comply out of interest with their activities. SDT considers that if the basic psychological needs (BPN) are satisfactorily attended, they could promote more intense well-being sensations (Deci and Ryan, 1985). According to Ryan and

Deci (2007), SDT is not based on social involvement factors deriving from the ambiance, but rather from the mediation that the teacher can process in this environment (classes' ambiance, teachers' motivations and behaviours) satisfying the three BPN: Autonomy (self-government), Competence (to perceive and feel able to do something), and Relatedness (building of affective relationships).

Van den Berghe, Cardon, Tallir, Kirk and Haerens (2016) suggest that teachers/technicians should structure the learning set with challenging tasks with positive feedback, allowing clear and objective guides. When an individual has a higher level of satisfaction, pleasure and excitement during an activity, we can say that he/she is intrinsically motivated, just because he/she finds enjoyment without needing reinforcement or external rewards. Consequently, we have individuals tending to be less

involved in activities regulated to less self-determined modes, or extrinsically motivated.

Also according to SDT, motivation could vary among four levels of behaviours (Deci and Ryan, 2000): External Regulation occurs through behaviours regulated by material awards or even by fear of negative consequences, as punishment; Introjected Regulation represents a small internalization, but not still integrated to daily actions; Identified Regulation, when the individual accomplishes the activity believing it is important in some way, even if he/she is not pleased to do it; Integrated Regulation happens when actions extrinsically motivated were integrated in the long run into the individual's life; Amotivation reveals the total absence of behaviour; it is found when the student does not intend to perform any practice.

If motivation is more tied to teacher mediation than the environment (Ryan and Deci, 2007) it would be appropriate to check the effect of an intervention program based on BPN satisfaction on motivation and BPN in School Physical Education (objective of this study).

## Method

### Participants

The research was conducted in a public school of the state education network of the city of São José do Rio Pardo, in São Paulo State, Brazil. The sample was composed of 42 students from a state public school, divided in two (2) groups: Control Group (CG) and Intervention Group (IG), chosen by lottery. The participants of CG were 18 students, 13 boys (mean age=13.38±0.49) and 05 girls (mean age=13.40±0.49), and 24 students were on IG, 15 boys (mean age=13.40±0.49) and 09 girls (mean age=13.56±0.50). In each group, there was one Physical Education at school teacher.

### Instruments

Students of both groups answered, in the beginning, and at the end of the intervention programme (only the IG), to two questionnaires, during the regular classes of Physical Education. The Questionnaire for Assessment of the Basic Psychological Needs in Physical Education (BPNES) was adapted to the Portuguese, with evidence of psychometric validity in the Brazilian context (Costa, 2015). The Perceived Locus Causality Questionnaire (PLOCQ) was translated and validated for the Brazilian population (Tenório, 2014). This instrument assesses the students' motivation, and it is composed of 20 questions based on SDT and subdivided into five dimensions: intrinsic

motivation, identified extrinsic motivation, introjected extrinsic motivation, external extrinsic motivation and amotivation.

### Procedure

One weekly intervention during ten weeks with the IG school Physical Education teacher was conducted after the initial application of the instruments. The objective of this intervention was to adapt the planned class so that it conducted the students to comply with the BPN using exercises/activities promoting more autonomy, competence and social relationship. The researcher made no intervention on CG. In the first meeting, there was a discussion about the project, presentation of the SDT and the importance of conducting activities that could satisfy the students' BNP. In the second, motivational teacher strategies were discussed. In the third, the focus was to develop athletic activities that promoted competence and autonomy. In the fourth was a gymkhana focused on cooperation and social relation. In the fifth, strategies to increase the involvement and social relation of the students in the classes. In the sixth activities aimed at promoting greater social relation and perception of students' competence. In the seventh strategies to foster autonomy. In the eighth to discuss the positive and negative points of interventions, focusing on reducing antisocial behaviors. In the ninth promote greater autonomy, competence and social relation in the organization of a sporting championship. In the tenth, we discussed aspects related to setting goals and objectives of the classes in order to increase the motivational climate.

### Data analysis

Data from these instruments were treated using the SPSS 20.0 statistical package. To identify differences between the groups (IG and CG) before and after the intervention, a T-test for independent samples was used. To verify if there was a difference between IG and CG after the intervention, a T-test for dependent samples was applied. The significance level of 5% was adopted. The percentage of variation (relative delta) was used from post-test to pre-test for the measured variables.

## Results

Motivation's levels decreased in IG in three factors: introjected external motivation ( $t(23)=3.18$ ;  $p=0.004$ ;  $d=0.66$ ), external extrinsic motivation ( $t(23)=2.78$ ;  $p=0.011$ ;  $d=0.90$ ) and amotivation ( $t(23)=2.67$ ;  $p=0.014$ ;  $d=0.80$ ). No significative additional effect was observed in the experimental group. In the

CG there was not a significant change in the studied variables (see Table 1).

The percentage of variation (relative delta) from post-test to pre-test among the measured variables was studied and it was observed that only the variable amotivation showed a significant statistically difference between CG and IG after the intervention ( $t(40)=2.06$ ,  $p=0.004$ ,  $d= 0.63$ ) (Table 2 here).

## Discussion

The results of this study corroborate other studies involving motivation in school physical education classes (Fernandes and Vasconcelos-Raposo, 2005; Pires, Cid, Borrego, Alves, and Silva, 2010) in which the students presented moderate/high indexes of introjection.

For Standage, Duda, and Ntoumanis (2003), a negative link has emerged between amotivation toward physical education and students' intentions to be physical active in their own leisure time, so, the reduction in this dimension can be considered a positive factor as a way to improve the level of physical activity of these students in and out of school.

There is a prevalence of studies involving motivation in contexts of sports and/or physical education practice, although there is also a lack of investigations involving intervention's strategies promoting positive changes in motivation.

In this study, we have opted to design an intervention's programme emphasising activities/exercises based on compliance with BPN as a means to increase motivation's levels and thus decreasing amotivation. Although there was no evidence in this study of increased levels of SDT (intrinsic motivation), there was a decrease in less SDT levels (introjected external motivation, external extrinsic motivation and

amotivation). However, as outlined by Ryan and Deci (2007), internalization is a progressive process by which external regulations are transformed into internal regulations as the person "takes in" the value and integrates the activity into his or her repertoire of need-satisfying behaviors. Standage, Gillison, and Treasure (2007) also point out that psychological need satisfaction only in part determines self-determined forms of motivation in physical education, according to the SDT theory perspective, social factors have an important role in determining motivation involvement.

For Standage, Gillison, and Treasure (2007) to promote adaptive student learning, effort, self-determined motivation, and well-being, physical education teachers might aim to facilitate physical education class environments that support the BPN of autonomy, competence, and relatedness. Teachers can do this, for example, by adopting the appropriate autonomy-supportive discourse to appeal these needs (e.g., "OK, class, you can discuss among yourselves [relatedness] and agree on your choice(s) [autonomy] of the practice(s) you do today, and remember, you can improve your personal goals by choosing the practices that will improve important parts of your game/event [competence]").

It is necessary to highlight the difficulty of generalisation of the results/effects from different samples since our study focused on a particular group of students in a determined context. These results point to the need to conduct other studies, with a longer time frame, to verify more positive alterations in motivation's levels and BPN. It is also important to make new data collection at different periods post-intervention, aiming to verify if these effects and behaviours were maintained (internalization) even after the end of the programme.

	Control Group (n=18)			Intervention Group (n=24)		
	Pre-test	Post-test	p	Pre-test	Post-test	p
BPNPES - A	13,77 ± 3,65	12,77 ± 4,69	0,339	15,08 ± 4,65	13,54 ± 6,12	0,312
BPNPES - C	14,83 ± 4,31	14,72 ± 5,15	0,896	16,66 ± 4,10	15,45 ± 6,55	0,375
BPNPES - R	13,66 ± 4,29	14,78 ± 5,10	0,328	16,37 ± 3,71	13,91 ± 6,73	0,116
PLOCQ - IM	22,22 ± 5,45	21,27 ± 6,56	0,530	24,41 ± 4,68	21,20 ± 8,91	0,124
PLOCQ - InEM	13,88 ± 5,91	14,05 ± 6,56	0,895	20,54 ± 4,69	16,04 ± 8,39*	0,004
PLOCQ - IdEM	20,50 ± 6,78	20,17 ± 6,30	0,808	23,95 ± 4,37	21,71 ± 8,97	0,284
PLOCQ - EEM	9,83 ± 4,07	9,22 ± 4,80	0,619	14,58 ± 6,23	9,42 ± 5,16*	0,011
PLOCQ - A	9,39 ± 5,86	8,55 ± 5,24	0,698	10,17 ± 7,04	5,54 ± 4,15*	0,014

Note: BPNPES: A stands for Autonomy dimension; C to Competence dimension, and R to Relatedness dimension on Basic Psychological Needs in Physical Education Scale. PLOCQ: IM stands for Intrinsic Motivation; InEM to Introjected Extrinsic Motivation; IdEM to Identified Extrinsic Motivation; EEM to External Extrinsic Motivation, and A, to Amotivation, from the instrument Perceived Locus of Causality Questionnaire.

Table 1: Pre and Post-test results considering all the variables studied

	Relative Variation		
	Control Group	Intervention Group	d
BPNPES – A	7,26%	10,21%	0,65
BPNPES – C	0,74%	7,26%	0,69
BPNPES – R	8,19%	15,02%	0,71
PLOCQ – IM	4,27%	15,62%	0,98
PLOCQ – InEM	-1,22%	21,90%	0,41
PLOCQ – IdEM	1,60%	9,35%	0,53
PLOCQ – EEM	6,20%	35,39%	0,89
PLOCQ – A	8,94%	45,52%	0,04

Note: BPNPES: A stands for Autonomy dimension; C to Competence dimension, and R to Relatedness dimension on Basic Psychological Needs in Physical Education Scale. PLOCQ: IM stands for Intrinsic Motivation; InEM to Introjected Extrinsic Motivation; IdEM to Identified Extrinsic Motivation; EEM to External Extrinsic Motivation, and A, to Amotivation, from the instrument Perceived Locus of Causality Questionnaire.

Table 2: Comparison of the relative variation between groups

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PALABRAS CLAVE: Motivación, necesidades psicológicas básicas, educación física escolar.

RESUMEN: La motivación es una variable que influye en el comportamiento de actividades físicas y deportivas y que promueven consecuencias positivas como el placer, la diversión y el bienestar. El objetivo de este estudio fue verificar el efecto de un programa de intervención sobre la motivación y las necesidades psicológicas básicas (BPN) en la Educación Física Escolar. Se investigó a 42 estudiantes de una escuela pública estatal, divididos en dos grupos diferentes (Grupo de Control (CG) e Grupo de Intervención (IG)). El CG estaba compuesto por 18 estudiantes y el IG por 24 estudiantes. Los alumnos de ambos grupos respondieron al inicio y al final del programa de intervención dos cuestionarios diferentes (BPNES, PLOCQ). Después de la aplicación inicial de los instrumentos, se realizó una intervención de orientación semanal durante 10 semanas sólo con el profesor de Educación Física de la Escuela IG, quien buscó adaptar la clase para llevar a los alumnos al BPN (mayor autonomía, competencia y relación). Después de la intervención, hubo una disminución de IG en tres factores, con altos tamaños de efectos, lo que indica un alto significado práctico. Los factores intervenidos en el IG fueron: motivación extrínseca introyectada, motivación extrínseca externa y amotivación. En el CG, no se observó ningún cambio significativo en las variables. También se exploró el porcentaje de variación del post-test para el pre-test entre las variables medidas, observando que sólo en la variable de amotivación hubo una diferencia estadísticamente significativa entre los grupos CG e IG después de la intervención.

## Referencias

- Costa, L. C. A. (2015). *Influência de um programa de ensino de esportes coletivos de invasão na motivação e desempenho motor de escolares no ensino fundamental*. Dissertação de Mestrado, Universidade Estadual de Maringá, Maringá, PR, Brasil.
- Deci, E. L., and Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum Press.
- Deci, E. L., and Ryan, R. M. (2000). "The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Review of Psychological Inquiry*, 11(1), 227-68.
- Fernandes, H. M., and Vasconcelos-Raposo, J. (2005). Continuum de autodeterminação: validade para a sua aplicação no contexto desportivo. *Estudos de Psicologia*, 10(3), 385-95.
- Hagger, M., and Chatzisarantis, N. (2008). Self-determination theory and the psychology of exercise. *International Review of Sport and Exercise Psychology*, 1(1), 79-103.
- Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, 71(2), 225-42.
- Pires, A., Cid, L., Borrego, C., Alves, J., and Silva, C. (2010). Validação preliminar de um questionário para avaliar as necessidades psicológicas básicas em Educação Física. *Motricidade*, 6(1), 33-51.
- Reinboth, M., and Duda, J. L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise*, 7(3), 269-86.
- Ryan, R. M., and Deci, E. L. (2007). Active human nature: Self-determination theory and the promotion and maintenance of sport, exercise, and health." In M. S. Hagger and N. L. D. Chatzisarantis (Eds.), *Self-determination theory in exercise and sport* (Chap. 1, pp. 1-19). Champaign: Human Kinetics.
- Standage, M., Duda J. L., and Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology*, 95(1), 97-110.
- Standage, M., Gillison, F., and Treasure, D. C. (2007). Self-determination and motivation in physical education. In M. S. Hagger and N. L. D. Chatzisarantis (Eds.), *Self-determination theory in exercise and sport* (Chap. 4, pp. 71-85). Champaign: Human Kinetics.
- Tenório, M. C. M. (2014). *Motivação de Professores e estudantes para as aulas de Educação Física no Ensino Médio*. Tese de Doutorado, Universidade Federal de Pernambuco, Recife, PE, Brasil.
- Van den Berghe, L., Cardon, G., Tallir, I., Kirk, D., and Haerens, L. (2016). Dynamics of need-supportive and need-thwarting teaching behavior: the bidirectional relationship with student engagement and disengagement in the beginning of a lesson. *Physical Education and Sport Pedagogy*, 21(6), 653-70.