Autonomy support in student's resilience through a cognitive-social model of motivation

Apoyo a la autonomía en la resiliencia de los estudiantes a través de un modelo cognitivo-social de motivación

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Abstract

The present study tests the predictive relationship of teacher's autonomy support on student resilience through a cognitive-social model of motivation. A total of 1149 students participated (52% male and 48% female) from fifth (n = 566) and sixth grade (n = 583) from elementary schools in the State of Chihuahua, Mexico. With a range of 10 and 13 years (M = 10.51; SD = .67). A positive prediction of autonomy support on resilience, through the mediator's basic psychological needs, autonomous motivation, cooperation and affiliation was confirmed. Data reveal that fostering autonomy support is related to students' psychosocial well-being, strengthening adaptive and resilient behavior in the face of adversity. This predictive design is an important guide for the preparation and interventions that work on resilience, as well as cooperativity and affiliation, with strategies of autonomy support.

Keywords: physical education, basic psychological needs, social interaction, affiliation, and cooperation, adaptive behaviors.

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Resumen

El presente estudio comprueba la relación predictiva del apoyo a la autonomía del profesor en la resiliencia de los estudiantes a través de un modelo cognitivo-social de motivación. Participaron 1149 estudiantes (52% hombres y 48% mujeres) de quinto (n = 566) y sexto grado (n = 583) de escuelas primarias del Estado de Chihuahua, México. Con un rango de 10 y 13 años (*M* = 10.51; *DE* = .67). Se confirmó una predicción positiva del apoyo a la autonomía sobre la resiliencia, a través de los mediadores necesidades psicológicas básicas, motivación autónoma, cooperación y afiliación. Los datos revelan que el fomento del apoyo a la autonomía se relaciona con el bienestar psicosocial de los estudiantes, fortaleciendo una conducta adaptativa y resiliente ante la adversidad. Este diseño predictivo es una guía importante para la preparación de intervenciones que trabajen la resiliencia, así como la cooperatividad y la afiliación, con estrategias de apoyo a la autonomía.

Palabras clave: educación física, necesidades psicológicas básicas, interacción social, afiliación y cooperación, conductas adaptativas.

INTRODUCTION

The physical education (PE) teacher, according to the Mexican curricular plans must assume a primary role in motivating students to explore and perform various motor actions, with the purpose of satisfying the students' interests, needs and expectations (Secretaría de Educación Pública, SEP, 2017). A theory widely used to understand and explain human behavior and what motivates it; is the self-determination theory (SDT, Deci & Ryan, 1985), which described the level of volitional commitment and self-decision manifested by each individual (Ruiz, Moreno-Murcia, & Vera, 2015). Teachers who use autonomy support as an interpersonal teaching style, demonstrate less control, and attend to students' needs, this will increase students' motivation and interest in their classes (Chang *et al.,* 2016; Pérez-González *et al.,* 2019). Students who displayed an autonomous attitude tend to have a better disposition and adherence to the practice of physical activity with greater commitment and academic interest (Moreno-Murcia, Huéscar & Ruiz, 2018; Sevil *et al.,* 2017). Autonomy support refers to what a person does and says to identify, foster, and enhance the internal motivational resources (need for autonomy, intrinsic motivation, personal interests, self-approved values) of another person (Reeve, 2009; Salazar & Gastélum, 2020). In PE, this refers to the degree of which the teacher supports and influences the basic psychological needs (BPN) of students (Tessier, Sarrazin, & Ntoumanis, 2010), which can increase their intrinsic motivation.

However, in Mexico there is a predominance of a traditionalist teaching style among PE teachers (Nájera *et al.,* 2020; Ramírez & Chel, 2019), which is associated to the top-

down pedagogical approach (Kirk, 2010) in which the teacher exercises total control and the student total submission. Students who are under a controlling style tend to feel frustrated, dissatisfied (Moreno-Murcia, Huéscar & Ruiz, 2018), and shows an increase in antisocial behaviors (Cheon & Reeve, 2015; Cheon, Reeve, & Ntoumanis, 2018, 2019). Currently, in the PE context there are few studies that have analyzed this situation from the students' perspective, whether the motivational style used by the PE teachers can affect their motivation levels, social interaction preferences and the level of resilience. It is important to analyze these variables since the pre-adolescence stage of development is a critical period for students who by nature undergo physical and biological changes, added to the stress of the social context.

A large number of studies have shown the use of SDT to understand how fostering autonomy support allows the learner to benefit from multiple adaptive related outcomes (Ryan & Deci, 2017).The results founded, shows the idea that people have an innate tendency toward growth, and they actively seek to manage their environment with interactions that allow them to integrate new and positive experiences in enhancing their sense of worth. Within the SDT, the sub-theory of the BPN is used to understand the regulation of behavior and the relationship that may exist between them and motivation (Aibar *et al.,* 2015; Krause, North, & Davidson, 2019). The BPN are the needs for autonomy (need to feel creator of one's own behavior), competence (need to feel able to complete a task masterfully and effectively) and relatedness (need to be able to interact with others safely) that are innate to human beings. When the BPN are satisfied there is an increase of self-determined forms of motivation (intrinsic motivation), it has been observed that higher levels of autonomous motivation are associated with high levels of participation and satisfaction in PE, physical activity and sport (Hernández, Silveira & Moreno-Murcia, 2015; Leyton-Román, Núñez, & Jiménez-Castuera, 2020). The frustration of the BPN can produces higher levels of extrinsic motivation and amotivation, the absence of motivation (Baena-Extremera *et al.,* 2016; Fin, Moreno-Murcia, & Nodari, 2017).

In order to satisfy these needs, it is essential to create a favorable environment, where the motivational teaching style is the fundamental mediator between the BPN and autonomous motivation in students (Zanetti *et al.,* 2017). Abualkibash & Lera (2017) suggested that the satisfaction of the BPN in PE classes strengthens and improves internal resources such as well-being related to resilience. However, the frustration of these will increase the vulnerability of the person. The SDT also distinguishes the most intrinsic motivational behaviors according to relative levels of autonomy (Roth *et al.,* 2009), thus forming the difference between autonomous and controlled motivation. The former involves will and choice, while the latter involves a feeling of pressure or compulsion (Hagger *et al.,* 2014).

In children the development of social interaction skills is important as it contribute to their cognitive and psychological well-being (Navarro-Patón *et al.,* 2019a). Two of the

most relevant are cooperation and affiliation. Cooperation occurs when students' goals are linked, and affiliation promotes feelings of belonging and increases their interest in the learning process and influence the well-being of students, which tend to pay attention in cooperation and affiliation as they grow older (Navarro-Patón *et al.,* 2019b). The teacher's role and interpersonal teaching style can influence, positively or negatively, on the student's self-determined behavior (Aibar *et al.,* 2015). According to Zueck *et al.* (2020) who had conducted research with elementary school children in Chihuahua, indicates that the motivational strategies used by teachers affect the level of satisfaction and intention to participate in their classes. One example of motivational strategies is asking for students' preferences, that can increase autonomous motivation and feelings of affiliation among students (Teixeira *et al.,* 2012), which will produce an adaptive behavior during their classes.

However, throughout the educational process, students sometimes are face with challenges which are related to the management of materials, expectations of competence, difficulties of tasks, and unresolved problems or pressures related to social relationships. In this scenario students can be lead to a low quality of motivation, which could be avoided if students had a resilience to adversity that would help them recover from these obstacles, resuming task with high effort capacity and turning problems into personal challenges that can help them progress academically and personally (Reeve, Cheon, & Yu, 2020). This behavioral adaptation is related to resilience, which is defined as a dynamic process or construct of positive adaptation in the face of adversity, which allows human beings to learn from these unfavorable situations to move forward in their personal life (González-Arratia, Valdez, & Zavala, 2008; Gras *et al.,* 2019). According to Gaxiola, González & Contreras (2012) some characteristics of someone resilient are: self-efficacy, autonomy, initiative, planning capacity, empathy and sense of humor. Also were observed a higher level of positive affectivity and self-esteem (González-Arratia, Domínguez & Valdez, 2017). The study of resilience at school age (between nine and 12 years old) allows teachers to identify what the child can or cannot do depending on their age (Quisbert, 2014). An optimal level of psychological well-being strengthens the internal resources related to resilience, which is not only forged in those with complex social environments, but in the ordinary human being, who faces daily with stressful and difficult situations (Trigueros *et al.,* 2020).

The principles surrounding SDT and the effects of satisfying BPN are to generate quality motivation and ultimately increase the variables related of the student's personal strength are very important. Previous literatures have shown the perception of the autonomy-supportive teaching interaction style (positive interpersonal orientation) is a key factor regarding its ability to provide students with an ideal scenario with the satisfaction of these basic psychological needs for optimal development (Ryan & Deci, 2017).

Although some research has analyzed the relationship between autonomy support and its effects on student behavior in the context of PE (Chang *et al.,* 2016; Pérez-González *et*

al., 2019), very few have delved into the relationship of autonomy support with resilience (Abualkibash & Lera, 2017; Montero-Carretero & Cervelló, 2020; Reeve, Cheon, & Yu, 2020), taking as a mediating variable the quality of students' social bonds with their classmates. In this sense, the aim of the present study is to test the predictive relationship between autonomy support on resilience, through the BPN, autonomous motivation, cooperation and affiliation as cognitive-social mediators.

RESEARCH METHODOLOGY

Participants

The study sample, obtained non-randomly and by convenience, consisted of a total of 1149 students (52% male and 48% female) in fifth (n = 566) and sixth (n = 583) grades in public primary institutions of a medium to low socioeconomic level, belonging to both urban and rural areas in the state of Chihuahua, Mexico. The age ranged between 10 and 13 years (*M* = 10.51; SD = 0.67).

Instruments

Autonomy support. To measure the need for autonomy support perceived by students from their teacher in PE classes, the *Autonomy Support Scale* (Moreno-Murcia *et al.,* 2020) was used. It is composed of 11 items (e.g., "Offers different ways to perform a certain task"). The instrument begins with the heading "In my PE classes, my teacher…". It evaluates the responses on a Likert-type scale ranging from "1" (*surely not*) to "5" (*surely yes*). The internal consistency obtained was .73. In the confirmatory factor analysis (CFA), the scale obtained adequate results: χ^2 (44, N = 1149) = 133.84, $p < 0.000$; χ^2/df = 3.04; NFI = .90; IFI = .93; TLI = .90; CFI = .93; RMSEA = .04 [.034, .050].

Basic psychological needs. To measure the BPN, the Spanish validated version (Moreno-Murcia *et al.,* 2008) of *Basic Psychological Needs in Exercise scale* was used (Vlachopoulos & Michailidou, 2006). The instrument consists of 12 items grouped into three factors: autonomy (e.g., "I have the opportunity to choose how to perform the exercises"), competence (e.g, "I perform the exercises effectively") and relatedness (e.g., "I feel very comfortable when I exercise with my peers"). The scale begins with the previous sentence "In my physical education classes…". It scores responses on a Likert scale from "1" (*strongly disagree*) to "5" (*strongly agree*). The internal consistency obtained was .62 for competence, .62 for autonomy and .70 for relatedness. The CFA presented adequate values χ^2 (38, N = 1149) = 277.54, $p < 0.000$; χ^2/df = 7.30; NFI = .89; IFI = .90; TLI = .83; CFI = .92; RMSEA = .07 [.066, .082].

Autonomous motivation. To measure autonomous motivation, the dimensions of intrinsic motivation, integrated regulation and identified regulation of the *Locus Perceived Causality Scale in Physical Education* (PLOC-2) were used (Ferriz, González-Cutre, & Sicilia, 2015). Each factor consists of four items: intrinsic motivation (e.g., "Because I enjoy learning new skills"); integrated regulation (e.g., "Because it is in line with my way of life"); identified regulation (e.g., "Because I want to learn sports skills"). The scale begins with the phrase "I participate in physical education classes…". It scored responses on a Likert scale from "1" (*strongly disagree*) to "7" (*strongly agree*). Internal consistency was .67 for intrinsic motivation, .69 for integrated regulation, and .76 for identified regulation. The CFA presented adequate values χ^2 (229, N = 1149) = 826.9, p < .000; χ^2/df = 7.30; NFI = .89; IFI = .92; TLI = .90; CFI = .92; RMSEA =.04 [.045, .052].

Cooperation/Affiliation. The cooperation and affiliation dimensions of the *Scale of Social Interaction Preferences in Physical Education* (GR-SIPPEL) were used (Ruiz, Graupera, & Mata, 2004). The dimensions are composed of seven items each: cooperativeness (e.g., "I like to say and do things that help others"); affiliation (e.g., "I need to participate in a group to feel good"). The items were preceded by the previous sentence "During physical education classes…"). Internal consistency was .65 for cooperative and .67 for affiliation. The CFA presented adequate values χ^2 (323, N = 1149) = 626.5, *p* < .000; χ^2/df = 1.94; NFI = .90; IFI = .95; TLI = .94; CFI = .95; RMSEA = .02 [.025, .032].

Resilience. The short version of the CD-RISC in its Spanish adaptation was used (Notario-Pacheco *et al.,* 2011), and validated by Soler, Meseguer, & García-Izquierdo (2016). It is comprised of 10 items in a single factor (i.e., "I can face anything"). The previous heading was "Indicate to what extent each statement has been true in your case". Responses are scored on a Likert type scale from "0" (*not at all*) to "4" (*almost always*). Internal consistency was 0.80. The CFA presented adequate values: χ^2 (35, N = 1149) = 82.9, *p* < .000; χ^2/df = 2.37; NFI = .96; IFI = .97; TLI = .96; CFI = .97; RMSEA = .03 [.025, .044].

Design and Procedure

This study adopts a non-experimental cross-sectional, descriptive, and predictive methodology. A permit from the Educational Services of the State of Chihuahua (SEECH) was obtained and registered with the Faculty of Sciences of Physical Culture of the Autonomous University of Chihuahua, approved with registration number 02052019-100. Subsequently, permissions through an informed written consent was obtained from the director of the institution, parents/guardians. After a brief explanation of the intentions and purpose of the research the students consent upon receiving the document. To preserve the anonymity and confidentiality of the participants, each student received a code. These activities took approximately 25-35 minutes to be completed.

DATA ANALYSIS

Descriptive statistics were computed and bivariate correlation analyzes were performed (Table 1). Cronbach's Alpha coefficient was used to calculate the internal consistency of each scale. To test the hypothesized model, we carried out a structural equation model (SEM) through the maximum likelihood (ML) estimator. This estimator SEM model adequacy was assessed according to the following goodness-of-fit indexes: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) with its respective Confidence Interval (CI90%). As cut-offs, CFI and TLI ≥ 0.9, and RMSEA ≤ 0.8 were considered as acceptable (Byrne, 2016; Hair *et al.,* 2019; Marsh, Hau, & Wen, 2004). The Confidence Interval at 95% (CI95%) was considered to measure direct and indirect effect among constructs, accepting significance if the CI does not encompass zero (Williams & Mackinnon, 2008).

To test an explanatory model, a structural equation modeling analysis was performed to measure the predictive power of teacher autonomy support, basic psychological needs, autonomous motivation, as well as cooperation and affiliation over resilience. The statistical programs SPSS 25 and AMOS 25 were used.

RESULTS

Descriptive and correlation analysis of all variables

Mean, standard deviations, and correlations among the study variables are presented in Table 1. The teacher autonomy support had a mean value of 3.78. In regards to the BPN, the most valued dimension was relatedness, followed by competence and autonomy, respectively. With reference to autonomous motivation, the identified regulation was the most valued, followed by the intrinsic motivation and the integrated regulation. Cooperation received a score of 3.19, while membership averaged 2.69 and resilience had a value of 2.52. All variables were positively and significantly related to each other (Table 1). Although some CMIN/DF value were above the normal (3 or less indicating an acceptable model fit and a value of 5 or less indicating a reasonable fit), it must be noted that in the results of the CFA, CMIN statistic for the best model fit is sensitive to sample size, and always rejects the model (Hooper *et al.,* 2008). Thus, the results of the CFA are acceptable within the limits established for the goodness of fit indices used. Also, within a standard exploratory analysis, the internal consistency value around 0.7 is adequate and is the minimum acceptable level (Nunnally, 1978, Nunnally & Bernstein, 1994). The author acknowledges that lower values are sometimes used in the literature. In the early stages of research or exploratory studies an internal consistency value of 0.6 or 0.5 may be sufficient. Loewenthal (1996) suggests that an internal consistency value of 0.6 may be considered acceptable for scales with fewer than 10 items.

Table 1.

*Mean, standard deviation and correlations between variables.*

	M	SD	α	1	2	3	4	5	6	7	8	9	10
1. Autonomy support	3.78	.68	.73	-	.35**	.31**	.28**	.28**	.28**	.30**	.26**	.16**	.18**
2. Autonomy	3.41	.82	.62	-	-	.52**	.35**	.34**	.42**	.34**	.30**	.31**	.26**
3. Competence	3.78	.74	.62	-	-	-	.46**	.48**	.52**	.50**	.37**	.27**	.35**
4. Relatedness	3.95	.82	.70	-	-	-	-	.45**	.39**	.46**	.39**	.21**	.25**
5. AM Intrinsic Motivation	5.65	1.24	.67	-	-	-	-	-	.67**	.69**	.36**	.19**	.35**
6. AM Integrated Regulation	5.39	1.28	.69	-	-	-	-	-	-	.68**	.34**	.29**	.37**
7. AM Identified regulation	5.71	1.15	.76	-	-	-	-	-	-	-	.35**	.21**	.35**
8. Cooperation	3.19	.52	.65	-	-	-	-	-	-	-	-	.45**	.22**
9. Affiliation	2.69	.60	.67	-	-	-	-	-	-	-	-	-	.19**
10. Resilience	2.52	.77	.80	-	-	-	-	-	-	-	-	-	-

*Note: ** p < .001; AM: autonomous motivation. α, Cronbach's Alpha mean.*

Structural equation model

To test the predictive model, the indicators of some latent variables were partialized. Thus, teacher autonomy support was composed of two factors, with six and five items, respectively. Nishimura & Suzuki (2016) used a similar procedure. BPN were divided into three factors (autonomy, competence, and relatedness) formed by the means of the four items from each construct. As for autonomous motivation, it was divided into three factors (intrinsic motivation, integrated regulation, and identified regulation) each one by the means of the four items of each construct. With respect to cooperation and affiliation each one was formed by the average of the seven items that defines them. Resilience was composed of two factors, each consisting of five items. The results of the maximum likelihood process analysis together with the bootstrapping procedure as described below (χ^2 = 348.279; df = 50; χ^2/df = 6.96; p = .000; NFI = .93; IFI = .94; TLI = .90; CFI = .94; RMSEA = .07 [.065, .079]). These findings show a positive prediction between autonomy support and resilience through the mediators BPN, autonomous motivation, cooperation, and affiliation (Figure 1).

Figure 1.
Structural equation model.
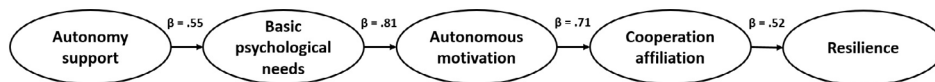
*Note: ***p <.001*

DISCUSSION

This study demonstrated the autonomy support interpersonal teaching style positively predicts resilience through the satisfaction of the BPN, over the autonomous motivation and the cooperation and affiliation. Regarding the satisfaction of the BPN and autonomous motivation, similar results have been found in previous researches (Moè & Katz, 2020; Moreno-Murcia *et al.,* 2018, 2019; Pérez-González *et al,* 2019). For this positive relationship to appear, other authors indicated that it is necessary for the teacher to favor the motivational climate in PE classes through the autonomy support and autonomous motivation to the students (Franco & Coterón, 2018). Students with higher levels of autonomy support from their teacher demonstrate better relationship among peers (Fin *et al.,* 2017; Fin *et al.,* 2019), which are in line with our findings as the autonomous motivation have predicted cooperation and affiliation in the sample. Similar results were obtained by Manzano & Valero-Valenzuela (2019), and Merino-Barrero *et al.,* (2019).

Those results obtained are consistent with those of Navarro-Patón *et al.* (2019b), in which students indicated a greater preference for cooperative learning tasks, followed by affiliation. Other study has also found that levels of cooperativity are the highest in elementary students (Ortega *et al.,* 2019), and the affiliation dimension appears to be necessary for the student to feel accepted in a group (Ruiz *et al.,* 2010).

As a novel contribution of this research, the social interaction preferences of cooperation and affiliation as predictive mediators of resilience are included in a single model. Consequently, the results represent a contribution to the literature regarding resilience. Within the PE context, few studies show that satisfaction of the BPN positively predicts resilience (Abualkibash & Lera, 2017; Reeve, Cheon, & Yu, 2020), teachers can empower students to develop behaviors or characteristics of a resilient person by encouraging autonomous motivation, which is significantly related to positive results in student's behavior and psycho-social well-being (Lim *et al.,* 2016). Therefore, it is relevant to investigate ways or strategies to support autonomy that help students to deal with stressful situations or experiences within the PE class.

Limitations of this research are the use of correlational methodology, so experimental studies would be necessary to analyze the cause-effect relationships with respect to the studied variables, in order to control the bias of the common method (Podsakoff *et al.,* 2003). In addition, the structural equation model suggested is the one that presented the best fit, but due to the problem of equivalent models presented by the structural equation technique (Hershberger, 2006) it is assumed that the model proposed is one of the many possible ones.

Conclusion, this work reflects the importance of the autonomy support interpersonal teaching style and its predictive relationship on resilience, through the cognitive-social mediators. The teacher who supports autonomy will not only succeed in enhancing autonomous students interested in PE classes, but will also contribute to both the psychological and social well-being of them, strengthening and increasing an adaptive and resilient behavior in the face of age-related adversities and others caused by external factors. This study is an important guide for the preparation of interventions or strategies to support autonomy, satisfaction of the BPN, social interaction skills that develop the adaptive capacity in the student and therefore resilience, in different age groups.

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