

**The importance of assigning responsibility during evaluation in order to increase student satisfaction from physical education classes: A model of structural equations**

**The importance of assigning responsibility during evaluation in order to increase student satisfaction.**

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Conceived and designed the experiments: ML SL RJ. Performed the experiments: ML SL MB RJ. Analysed the data: SL RJ. Contributed analysis tools: ML SL MB RJ. Wrote the paper: ML.

## Abstract

Considering the benefits that students report when evaluating physical education classes, the purpose of the present study was to analyse the relationships between the assignment of student responsibility in the evaluation, motivational variables and the satisfaction with the physical education classes, using The Theory of Self-determination as a support method. The sample for this study was 922 students, of both genres and in Compulsory Secondary Education, aged between 14 and 18 years. To carry out the study, the Student's Scale of Responsibility was used in the physical education assessment, the Basic Psychological Needs Measuring Scale, the Percentage Scale for Physical Education Causality and the Satisfaction Scale in Physical Education. The results of the structural equations model revealed a good adjustment to the data. This finding highlights the importance of giving responsibilities to the students in the evaluation process, in order to satisfy the psychological needs of the students and, therefore, self-determined motivation, thus increasing satisfaction towards physical education classes.

## Introduction

Physical education (PE) has become a framework for many youngsters to carry out physical activities, which then increases their motivation and adherence to do exercise after school [1, 2, 3].

The teacher is one of the main promoters of the practising of physical activities [4], for which their figure is crucial for the students to increase, or not, their level of regular physical activity [5]. However, in PE there are still

authors [6, 7] who indicate that, traditionally, teaching has consisted in a pedagogical model of direct instruction.

Research has determined that the teacher's use of strategies, with positive psychological aspects, such as the increase of students' intrinsic motivation in PE classes, will allow for the development and consolidation of behaviours related to physical activity [8, 9, 10].

Motivational phenomena combining a set of biological, emotional, cognitive and social aspects, which at the same time are interrelated with each other, influence persistence, intensity and frequency of behaviour, and interact with each other by increasing, maintaining or decreasing this behaviour [11].

One of the theories that helps to explain the motivation of students in PE classes is called the Self-determination Theory (SDT) [12, 13]. The SDT, proposes that motivation is framed throughout a three-level continuum [14, 15]: autonomous motivation (the most self-determined, required for an activity to be carried out for sheer pleasure), controlled motivation (carrying out an activity for reward or recognition outside of the activity) and demotivation (the least self-determined) [16].

Furthermore, it establishes three Basic Psychological Needs (BPN): autonomy (the desire to engage in activities by one's own choice), competence (the desire to interact efficiently with the means to feel competent) and relatedness (the desire to feel part of a group) [16, 12].

According to the SDT, the BPN constitute the psychological mediators that influence the three main types of motivation [12, 17]. Several studies

have used the BPN as mediators that positively predict the more self-determined forms of motivation [18, 19, 20].

The Hierarchical Model of Motivation (HMM) [21] associates BPN with the SDT [22]. According to the HMM, the pedagogical model used by the teacher will influence the satisfaction of the BPN and, consequentially, the level of autonomous motivation of the student. The level of self-determined motivation achieved can help to positively or negatively predict the cognitive, affective and behavioural results. As a result, the students who experience positive results in PE, such as enjoyment and the intention to be physically active, present a more self-determined, and therefore more autonomous motivation [23, 24] than the students that experience negative results like boredom. It is most likely that the latter demonstrate controlled motivation or demotivation and that they will run a greater risk of giving up physical activity and sport [25]. The model establishes that the social aspects of the environment (background variables) influence motivation, depending on the achievement or not of a series of BPN (autonomy, competence and relatedness), where satisfaction increases the degree of intrinsic motivation (motivational variables) [12, 16] and will lead to positive consequences on a cognitive, affective and behavioural level (consequent variables).

In PE classes, a linear and mechanistic pedagogical model has been predominant, oriented towards the psychometric results of students at the expense of social and cognitive results [26]. However, a climate in which responsibility is given to the student will generate positive thoughts about physical activity [27]. Different studies have revealed that when the teacher provides students with autonomy and responsibility, they value more highly

the PE classes and their enjoyment also increases [28, 29, 30]. In a recent study [31], with 532 students, guided by the TAD hypothesis, it was concluded that the student profiles of PE classes were mainly autonomous ones.

Evaluation can be considered as an instrument for monitoring and evaluating the results obtained by a student. The teacher can employ a more controlling teaching style, where more importance is given to results than to the learning process, or a teaching style that favours the autonomy of the student, where the student is a participant in their own learning process, using techniques such as self-evaluation, co-evaluation or hetero-evaluation [32]. Given the importance of the process in the achievement of results by the students, in this study, as a prior variable to the motivational variables, the perception of the assigning of student responsibility was used in the evaluation.

According to Hortigüela-Alcalá et al. [32], students take pleasure from being offered different strategies and alternatives to achieve their goals; This, in turn, increases intrinsic motivation towards classes and thereby the likelihood of students exercising outside of the classroom [33, 34]. Studies like that of Yonemura et al. [35], indicated that student participation in evaluation produced an increase in their commitment to learning. In the same way, it revealed the importance of proposing different strategies for evaluation in which student participation is included [36, 37]. Likewise, other authors [38, 39, 40, 41] highlight the importance of PE and sport being directed towards student autonomy and the designation of student responsibilities, claiming that a teaching style that gives subjects the chance to choose, participate and make decisions in classes, will give rise to a more enjoyable participation and

an increase in intrinsic motivation [18, 42, 43]. Therefore, students need to be given the opportunity to participate, by being given responsibilities. [44, 45, 46].

Following the HMM, the consequent variable of the present study was satisfaction with PE classes. According to Herrera-Mor et al. [47], the enjoyment that is experienced from an activity, understood as satisfaction in relation to pleasure and well-being, allows for participation to remain throughout time, for a greater adherence and for participation to become an integral part of lifestyle.

Similarly, enjoyment can be understood as the valued sense of the activities carried out in PE classes by the students [48]; and this variable (satisfaction with PE classes) is even related to the obtaining of a better academic qualification [49, 50]. As some studies have indicated, to avoid the abandonment of physical activity, teachers must try to make activities fun and avoid those which are not entertaining [51], thus presenting the teacher with an essential role to play in the development of these activities [52].

In this regard, Ntoumanis [53] explained that when subjects have fun they tend to be intrinsically motivated and give more importance to the subject. Satisfaction with PE classes will be positively related to the satisfaction of BPN as well as to a more self-determined motivation [48, 52].

Moreno et al. [54], in a sample of 819 students aged between 14 and 17 years, discovered that the most self-determined form of motivation positively predicted the importance given to PE classes and with this, satisfaction with the same.

In relation to satisfaction, motivation and boredom with PE classes, as several studies have shown [10, 55, 56, 57, 58, 59], high levels of self-determination are associated with greater effort, enjoyment, the importance of PE and the development of positive behaviour. In contrast, if motivation is less self-determined, the consequences will be negative, such as boredom in classes [9, 60].

Thus, the objective for this study was to analyse the relationships between the designation of student responsibility in evaluation, motivational variations and student satisfaction with PE classes, through obtaining a model of structural equations. Specifically, the hypothesis of the study was that the perception of the assignment of student responsibility during evaluation would positively predict the satisfaction of the BPN, positively predicting autonomous motivation, which would positively predict the satisfaction with PE classes.

## **Material and methods**

### **Research design**

The study carried out was correlational of a transversal style, in which the variables described above have not been altered or manipulated, only what occurs with them under natural conditions having been observed [61].

Likewise, it is located within quantitative empirical studies and, within these, it refers to the descriptive study of populations through surveys [62].

### **Sample**

The study sample was 922 students of both sexes (430 male and 492 female) from compulsory secondary education, more specifically from 3rd and 4th year of secondary school.

The type of sampling that was carried out was intentional by conglomerates. Each conglomerate was constituted by a classroom of about 18-19 students, obtaining 50 conglomerates. The ages of the sample were between 14 and 18 years ( $M = 14.95$ ,  $SD = .98$ ).

In Table 1, the distribution of the sample in terms of gender and year-group can be seen.

**Table 1. Distribution of the sample according to gender and year group.**

Year-Group	Male	Female	Total
3°	247	265	512
4°	183	227	410
<b>Total</b>	430	492	922

In Table 2, the distribution of the sample in terms of organisations that participated in the study and year-group is represented.

**Table 2. Distribution of the sample according to the school and the year-group.**

School	3°		4°		Total
	Male	Female	Male	Female	
School 1	22	20	16	10	68
School 2	19	27	11	3	60
School 3	22	36	24	32	114
School 4	54	56	47	48	205
School 5	29	19	22	32	102
School 6	42	43	18	60	163
School 7	18	21	0	0	39
School 8	41	43	38	35	157
School 9	0	0	7	7	14
<b>Total</b>	247	265	183	227	922
<b>Total Year-Group</b>	512		410		922

## Variables and measurement tools



In this section, the variables present in this investigation are revealed, divided according to the HMM: antecedent, motivational and consequent. In addition, a description is given of the instruments used to measure each of them.

## **Antecedent variables and measurement tools**

Level of responsibility of the student during evaluation: In order to know the perception of the level of responsibility that is given to the student in the evaluation, The Scale of Student Responsibility during Evaluation in Physical Education (ERAEEF) was used, adapted to Spanish by Moreno et al. [63]. It is made up of 11 items divided into 2 factors. In the present study, the factor known as the value of the transfer of responsibility in the result of the evaluation was used composed of 5 items (E.g. Working with the PE teacher to decide my score is important). Thus, in the Confirmatory Factor Analysis (CFA), the results showed acceptable adjustment indices [64]:  $\chi^2 = 55.00$ ,  $gl = 19$ ,  $p = .00$ ,  $\chi^2 / df = 2.89$ ,  $CFI = .99$ ,  $TLI = .98$ ,  $RMSEA = .05$  (IC 90% = .03, .06).

## **Motivational variables and measurement tools**

Basic Psychological Needs: To measure the satisfaction of the BPN, the Basic Psychological Needs Measurement Scale (BPNMS) was used, the original scale of Vlachopoulos & Michailidou [65] and validated to Spanish by Moreno et al. [66]. It is composed of 12 items divided into 3 factors. Each factor is made up of 4 items: Satisfaction of the BPN of Competence (E.g. The exercises that I perform are in line with my interests), Satisfaction of the BPN of Competence (E.g. I do the exercises effectively), Satisfaction of the BPN of Relatedness (E.g. I feel that I can communicate openly with my colleagues).

Regarding the CFA, the results showed acceptable adjustment indices [64]:  $\chi^2 = 57.79$ ,  $df = 24$ ,  $p = .00$ ,  $\chi^2 / df = 2.41$ , CFI = .99, TLI = .99, RMSEA = .04 (IC 90% = .03, .05).

Levels of Self-Determined Motivation: To measure the levels of self-determined motivation, the Perceived Locus of Causality in Physical Education (PLOC) was used. Original scale by Goudas et al. [67], and validated in Spanish by Moreno et al. [13]. It consists of 20 items divided into 5 factors. In the present study, a single factor has been used, autonomous motivation, composed of the grouping of intrinsic motivation (E.g. Because I enjoy learning new skills) and identified regulation (E.g. Because it is important for me to do well in PE). Regarding the CFA, the results showed acceptable adjustment indices [64]:  $\chi^2 = 296.79$ ,  $gl = 62$ ,  $p = .00$ ,  $\chi^2 / gl = 4.35$ , CFI = .96, TLI = .97, RMSEA = .06 (90% CI = .05, .07).

## **Consequent variables and measurement tools**

Satisfaction Level and Boredom in PE classes: To measure the level of satisfaction or boredom that students present in PE classes, the Basic Needs in Sport Satisfaction Scale (BNSSS) was used. A scale validated for sports by Duda & Nicholls [68] and validated to Spanish by Balaguer et al. [69]. It is composed of 8 items divided into two factors, of which only satisfaction with PE classes was used, with 5 items (E.g. Normally I find PE interesting). Thus, in the Confirmatory Factor Analysis (CFA), the results showed acceptable adjustment indices [64]:  $\chi^2 = 5.29$ ,  $df = 2$ ,  $p = .00$ ,  $\chi^2 / df = 2.65$ , CFI = .99, TLI = .99, RMSEA = .06 (IC 90% = .04, .09).

In all of the questionnaires that were used, answers were given to all of the items through a Likert Scale of 5 points, with a range from 0, which means

the student is in complete disagreement, to 5, meaning that the student completely agrees.

## **Procedure**

Having defined the objectives of the study, the measurement instruments were selected in order to collect information, a dossier was prepared, and some interesting data was gathered, such as age, school year, the practice of extracurricular physical activity and the school to which the students belonged. Subsequently, the different schools were contacted and the objective of the study was explained. They were given a consent form for the parents to sign, as the students were under 18 years of age.

Following this, specific days were chosen for visiting the schools and handing out the questionnaires to those subjects with parent authorisation, never in the presence of the PE teacher.

The time employed for the completion of the questionnaires was 40 minutes per class.

## **Data analysis**

The Confirmatory Factorial Analysis (CFA) was performed in order to verify the internal consistency of the questionnaires, and later, once the different variables were created, the descriptive statistics. The corresponding variables were created with the factors that showed adequate reliability indexes. Normality tests were performed, in order to determine what type of statistics should be used. The measurements of asymmetry, kurtosis, Kolmogorov-Smirnov, with the correction of Lilliefors, verified that the distribution of the sample was normal, for which parametric statistics were applied.

Then, Structural Equation Modelling (SEM) was employed, as it is considered to be the most effective tool for the study of causal relationships in non-experimental data [70].

The values  $p < .05$  and  $p < .01$  were used for statistical significance. Validity was also examined through confirmatory factor analysis, respecting the criterion of eliminating those items with a regression weight that did not present an adequate value (greater than .40) [72].

Regarding the CFA and SEM, they were carried out with Mplus [73], version 7.11. These analyses reveal some coefficients or fit indexes that allow us to check the validity of the variables of the instruments. These indexes of goodness of fit are the chi-square ( $\chi^2$ ), the degrees of freedom (gl), the significance (p), the  $\chi^2 / gl$ , the RMSEA (Root Mean Square Error of Approximation), the index CFI (Comparative Fit Index) and the Tucker-Lewis Index (TLI). The  $\chi^2 / gl$  is considered acceptable when it is lower than 5, the RMSEA with values lower than .05, and the CFI and TLI with values higher than .90 [64, 74].

For the reliability, descriptive, asymmetric, kurtosis and correlation analyses, the statistical program SPSS 21.0 was used.

For the analysis of reliability, two indices were used, Cronbach's Alpha ( $\alpha$ ) (equal to or greater than .70) [75], and Omega Coefficient ( $\omega$ ) [76], which also serves to check the internal consistency of the variables used in the investigation and, according to some authors (77), have shown evidence of greater accuracy. This means that in McDonald's Omega Coefficient the established range is between 0 and 1, with the highest values giving us the most reliable measurements [77]. With the Omega Coefficient of McDonald,

the calculations were made with the "psych" 1.4.2.3 [71] of R 3.0.3 (RCore-Team, 2014).

## Results

### Descriptive, reliability, asymmetry and kurtosis statistics

Table 3 presents the descriptive statistics of the instruments used for this study. This table shows the mean (M) and standard deviation (SD) of all study variables, observing that, in terms of BPN, the highest mean value was for the need for relatedness, which is equal to the satisfaction with PE classes, with the lowest average being the BPN of autonomy.

The results from the reliability analysis are also observed, in order to check the internal consistency of the questionnaires. All the factors were accepted and used in the analyses, given that Cronbach's Alpha ( $\alpha$ ) was equal to or greater than .70 [75] and that the Omega Coefficient of McDonald has high, close to 1 [77].

**Table 3. Reliability analysis and descriptive statistics.**

Instrument / Variable	M	TD	$\alpha$	$\omega$
<b>ERAEEF</b>				
Value Assignment Evaluation	3.58	.96	.77	.82
<b>BPNES</b>				
Satisfaction BPN Autonomy	2.97	.91	.80	.84
Satisfaction BPN Competence	3.68	.95	.80	.84
Satisfaction BPN Relatedness	3.89	.94	.85	.89
<b>PLOC</b>				
Autonomous Motivation	3.69	.87	.88	.91
<b>SSI-EF</b>				
PE Classes Satisfaction	3.89	.98	.89	.91

M, Media; TD, Typical Deviation;  $\alpha$ , Cronbach's Alpha;  $\omega$ , Omega coefficient.

In accordance with the normality rules proposed by Curran et al. [78] all of the variables comply with the univariate normality, since the values of asymmetry were below 2 and those of kurtosis below 7. These results can be seen in Table 4.

**Table 4. Asymmetry and kurtosis of the variables under study.**

Instrument / Variable	Asymmetry	Kurtosis
<b>ERAEEF</b>		
Value Assignment Evaluation	-.36	-.34
<b>BPNES</b>		
Satisfaction BPN Autonomy	.00	-.30
Satisfaction BPN Competence	-.46	-.38
Satisfaction BPN Relatedness	-.92	.45
<b>PLOC</b>		
Autonomous Motivation	-.57	-.12
<b>SSI-EF</b>		
PE Classes Satisfaction	-.80	.03

## Analysis of structural equations

In line with the HMM [21, 79], the antecedent variables (perception of the transfer of responsibility to the student in evaluation), the mediators (satisfaction of the BPN), self-determined types of motivation (autonomous motivation, controlled motivation and demotivation) and consequences (satisfaction with PE classes) were included.

In this model, the aim was to find out the predictors of satisfaction with PE classes, based on the perception of assigning responsibility to students and the motivational variables (satisfaction of BPN and autonomous motivation). The results are shown in Fig. 1.

# **Fig. 1. SEM.**

Predicting the students' satisfaction with PE classes from assigning them with responsibility in evaluation and motivational variables. All of the parameters are standardised, the most statistically significant are indicated with \* $p < .01$ .

The contribution of each of the factors to the prediction of other variables was examined through the standardised regression weights, hence, the value of the assignment of responsibility in the result of the evaluation predicted in a positive and significant way the satisfaction of the BPN of autonomy ( $\beta = .72$ ), competence ( $\beta = .87$ ) and relatedness ( $\beta = .70$ ). On the other hand, autonomous motivation was predicted in a positive way by the satisfaction of the BPN of autonomy ( $\beta = .49$ ), competence ( $\beta = .43$ ) and relatedness ( $\beta = .04$ ), with self-motivation predicting in a positive and meaningful way the satisfaction with PE classes ( $\beta = .85$ ).

The results of the model of structural equations revealed a good alignment to the data [64, 74], as can be seen in Table 5.

**Table 5. Adjustment indices of the Structural Equation Modelling.**

Indices	Values
$\chi^2$	1004.16
gl	202
p	.00
$\chi^2/\text{gl}$	4.93
CFI	.94
TLI	.93
RMSEA	.06 (IC 90% = .06, .07)

Regarding the indirect effects between the latent variables, the results are shown in the Table 6.

**Table 6. Indirect effects in Structural Equation Model.**

Variables	Effects
Value Assignment Responsibility Evaluation → Autonomous Motivation	.75
Value Assignment Responsibility Evaluation → Classes Satisfaction	.64
Satisfaction BPN Autonomy → Classes Satisfaction	.42
Satisfaction BPN Competence → Classes Satisfaction	.37
Satisfaction BPN Relatedness → Classes Satisfaction	.03

Table 6 shows the totals of the indirect effects. However, the results demonstrate that the indirect effects of the assigning of student responsibility in evaluation upon autonomous motivation vary according to the production level, via the satisfaction of the BPN of autonomy, which was  $\beta=.35$ . The satisfaction of the BPN of competence being  $\beta=.37$  and the satisfaction of the BPN of relatedness  $\beta=.03$ . Regarding the variable for the value of assigning students with responsibility during evaluation, we obtained that, via the satisfaction of students in PE classes and autonomous motivation,  $\beta=.30$ , via the satisfaction of the BPN of competence  $\beta=.32$  and, via the satisfaction of the BPN of relations and autonomous motivation  $\beta=.02$ .

## Discussion and conclusions

Given the relevance of assigning responsibility to the student in the evaluation for improving motivational processes and increasing student satisfaction with PE classes, the present study aimed to validate a model that would analyse these relationships from the HMM. The hypothesis stated that the perception of the assignment of responsibility to the student during



evaluation would positively predict the satisfaction of the BPN, which would positively predict autonomous motivation, in turn positively predicting the satisfaction with PE classes.

In terms of the results previously mentioned, It can be observed that the hypothesis was fulfilled, as it was already demonstrated that the perception of the assignment of responsibility to the student in the evaluation predicted in a positive and significant way the satisfaction of the BPN (autonomy, competence and relatedness), and that the satisfaction of the BPN positively predicted autonomous motivation, with a significant prediction of the BPN of autonomy and competence. Finally, the most self-determined form of motivation positively and significantly predicted satisfaction with PE classes.

In line with the model obtained, Moreno et al. [80] showed that responsibility positively predicted psychological mediators, and this predicted intrinsic motivation, which positively predicted the importance that students give to physical education, and this, finally, positively predicted the student's intention to continue playing sports.

Other studies have demonstrated that when students are offered the opportunity to choose tasks they improve their skills, their physical activity and their perceived competence [81]. It was also proven that there was a greater learner involvement when given the opportunity to make decisions with various methodological aspects such as space, time, material or grouping [82].

Motivation involves a set of emotional, cognitive and social phenomena, with which, according to studies, if a teaching style is used

where students are allowed to participate in the teaching-learning process, the cognitive and physical involvement will be greater [83]. This explains a greater satisfaction towards PE classes, and a greater commitment to learning, as students are more intrinsically motivated thanks to their involvement in the evaluation process [35]. Research carried out by Vera [30], with 49 students, also showed that the assignment of responsibilities to the students makes the satisfaction of the BPN of autonomy higher, and with it the satisfaction and enjoyment towards physical activity.

It has been confirmed that one key aspect to improving motivation is the assignment of responsibility to the student [18], along with the use of styles that favour the autonomy of the students [84]. Thanks to different works [18, 42], which are in line with our results, it can be affirmed that an assignment of responsibilities increases the most self-determined forms of motivation. The study by Gómez-Rijo et al. [85], reached the conclusion that the transfer of responsibilities to the student, by the teacher, contributes to the development of student autonomy. It also demonstrated [85] that giving autonomy to the student for the learning of physical skills improves autonomous motivation.

Evaluation must not only be linked to the teacher giving a score, but the student must be given the possibility to decide and intervene, taking into account initial and bidirectional agreements [87]. Other works developed in the educational field [88, 89], that related the satisfaction of the BPN to the self-determined forms of motivation, revealed, like in our study, that an adequate satisfaction of the BPN would increase intrinsic motivation.

The authors of these works have shown that a greater feeling of autonomy will increase intrinsic motivation [8, 9, 53, 60, 90, 91] and with this, satisfaction when participating in activities [39, 40, 41], supporting the results found in this study. However, other authors, performing intervention programmes to support teachers with the BNP, did not find significant results in intrinsic motivation [91].

A teaching-style where autonomy and decision-making is stimulated will reduce the demotivation of the students, as well as boredom with PE classes [94], as pointed out in the study by Moreno et al. [93]. Different works have indicated that the less self-determined forms of motivation and a lower perception of satisfaction of BPN [95] are related to the giving up of physical activity, which may be due to the lack of satisfaction with the PE classes.

Other studies which had similar results to ours, indicate that an increase in autonomy will make satisfaction with PE classes higher [82], and that students will be more involved in their tasks and their own learning process [82]. Different investigations, such as the one carried out by Méndez et al. [94], found that if a suitable atmosphere that involves the task is generated in the classroom, the satisfaction of the BPN will be greater, which will be positively related to more self-determined motivation and with less boredom with the classes of PE.

Research that is also related to our variables [48, 52, 54, 55], indicated that the satisfaction of the BPN predicted high levels of intrinsic motivation and that this was related to an increase in enjoyment and satisfaction with classes. It can therefore be said that there is a close relationship between

intrinsic motivation and satisfaction with classes [24, 96]. Some authors, in their results give particular importance to the BPN of autonomy [61, 98].

As many researchers have been proposing for some time [36, 37, 98], it is necessary to come up with new evaluation strategies which offer more student involvement. Strategies such as developing the students' ability to reflect on what they have done, substitute the final exam for a continuous process in which the students learn from their mistakes and successes, involve the student in making decisions, among others, which will mean that, based on the theoretical postulates of the HMM, the satisfaction of the BPN will be higher, as well as that the more self-determined forms of motivation will be increased, with levels of demotivation decreasing. This will have positive consequences, such as satisfaction with PE classes, and therefore, increase the possibility of physical activity outside the classroom.

One of the limitations found in this study was the sample, which would be interesting to expand to other areas and even differentiate by age, gender and socioeconomic level. Another limitation was seen from only using questionnaires, as only opinion is determined through a scale of answers. It would be interesting to make a methodological triangulation, using systematic observation and the use of interviews, both with students and with teachers. Once the results are known, a longitudinal or quasi-experimental study could be carried out, through an intervention that would allow us to establish cause-effect relationships, in order to know the effect caused by the application of different motivational strategies in the variables under analysis.

In conclusion, thanks to results from models such as ours, in PE classes intervention programmes are necessary to achieve more self-

determined motivation of our students, using different strategies such as posing tasks that are fun for them, by assigning them with responsibilities, proposing self-evaluation activities, as well as reciprocal evaluation so that they feel they are participants in their teaching and learning process. In this way, we can achieve that the students increase their levels of satisfaction of the BPN, which will lead to them showing higher levels of autonomous motivation in the classes and, consequently, to their satisfaction with the PE classes being greater.

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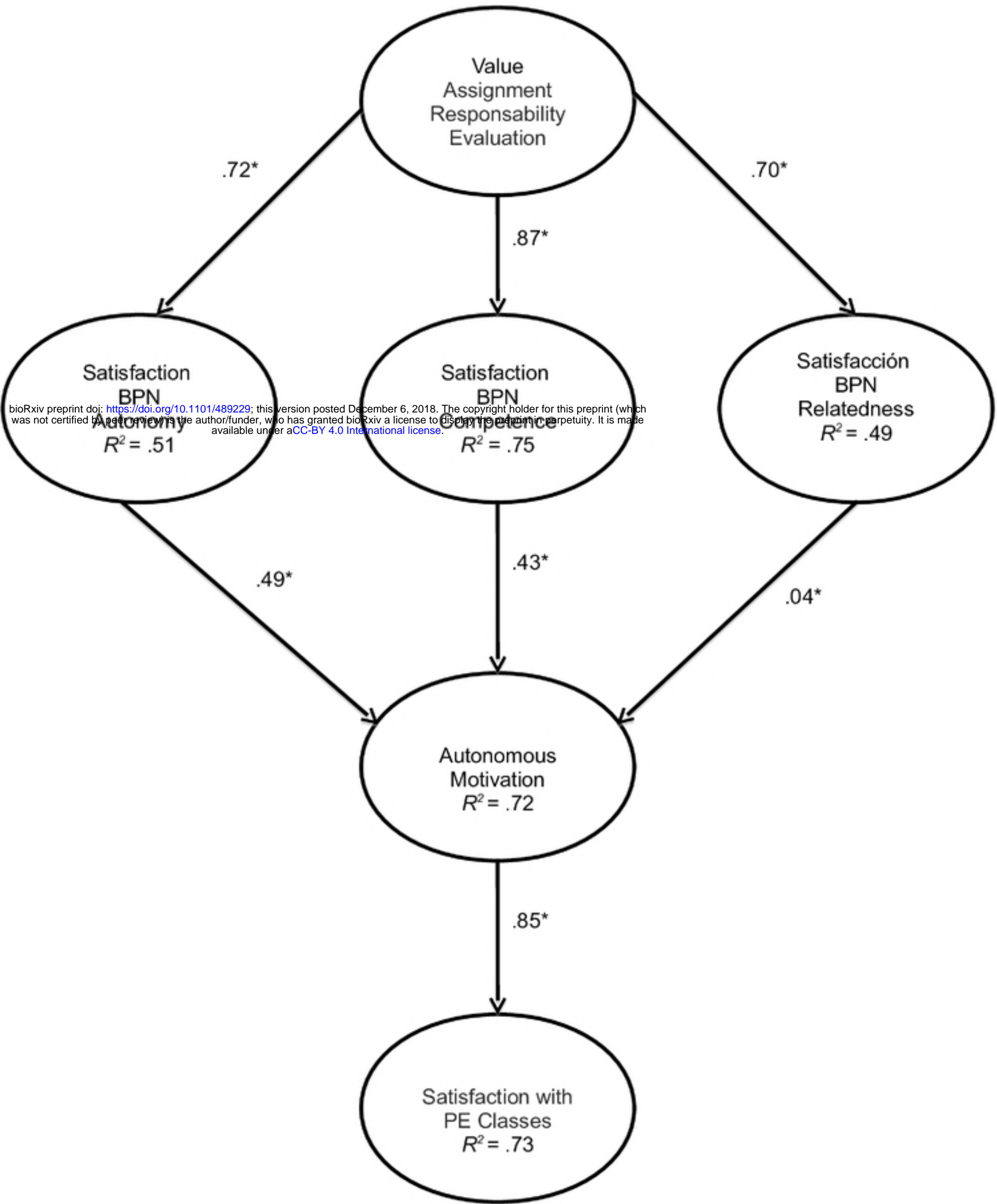
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Figure