






Can I be a teacher without motivation to teach? Adapting the basic psychological needs scale to prospective teachers

¿Puedo ser profesor sin motivación para enseñar? Adaptación de la escala de necesidades psicológicas básicas a futuros docentes

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ABSTRACT

There are still few studies that address the importance of knowing the psychological needs and frustrations of teachers at the basic levels of education when they are in the training period. The aim of this study was to revalidate the scale of basic psychological needs (S-PNTS) in order to recognize whether it is sufficiently adequate to apply and obtain results with guaranteed success in trainee teachers and to study the inference of socio-demographic and personal variables in frustration and psychological needs. A quantitative methodology has been used following a survey method with a non-experimental design, applied to a sample of 598 university students of the degrees of Teacher in Early Childhood Education and Primary Education, and of the Master's Degree in Teacher Training in Compulsory Secondary Education of two Spanish universities (one in the north and one in the south) and of equivalent degrees in a Chilean university, with an age range between 18 and 54 years old. The programs used were SPSS.24, Factor.10, MPlus.7 and G*Power 3. After carrying out the factor analyses, the result was that the scale was configured with one less item than the original one but maintaining the three-dimensional scale. The results also reveal that trainee teachers in Primary Education show a greater approximation to frustration than those in Early Childhood and Secondary Education. On the other hand, students from the south of Spain feel less competent, more autonomous and perceive a better relationship in the teaching environment than the rest. Likewise, men perceive themselves as more competent than women.

Keywords: S-PNTS, basic psychological needs, trainee teachers, validation

RESUMEN

Aún son escasos los estudios que tratan la importancia de conocer las necesidades psicológicas y frustraciones de los docentes de los niveles básicos de educación cuando se encuentran en el período de formación. El objetivo de este estudio ha sido revalidar la escala de necesidades psicológicas básicas (S-PNTS) para reconocer si es lo suficientemente adecuada para aplicar y obtener resultados con garantía de éxito en los docentes en formación y estudiar la inferencia de variables sociodemográficas y personales en la frustración y las carencias psicológicas. Se ha utilizado una metodología de corte cuantitativo siguiendo un método de encuestas con un diseño no experimental, aplicada a una muestra de 598 estudiantes universitarios de los grados de Maestro en Educación Infantil y Educación Primaria, y del Máster Universitario en Formación del Profesorado de Educación Secundaria Obligatoria, Bachillerato y Formación Profesional de dos universidades españolas (una del norte y otra del sur) y de titulaciones equivalentes en una chilena, con un rango de edad que oscila entre los 18 y 54 años. Los programas utilizados han sido SPSS.24, Factor.10, MPlus.7 y G*Power 3. Tras la realización de los análisis factoriales, se ha obtenido como resultado que la escala queda configurada con un ítem menos que la original, pero manteniendo la escala tridimensional. Los resultados también revelan que los docentes en formación de Educación Primaria muestran una mayor aproximación a la frustración que los de Educación

Infantil y Secundaria. Por otro lado, los estudiantes del sur de España se sienten menos competentes, más autónomos y perciben una mejor relación en el entorno docente que el resto. Asimismo, los hombres se perciben más competentes que las mujeres.

Palabras clave: S-PNTS, necesidades psicológicas básicas, docentes en formación, validación

INTRODUCTION

Motivation is an important psychological element for achieving any goal and arises from the known and admitted needs for personal development (basic psychological needs); however, when the expected results are not achieved or are not satisfied, frustration appears; that is, the impossibility of satisfying a need or desire (Ryan & Deci, 2017, 2019, 2020). It may happen that the non-fulfilment of needs and the appearance of frustrations are not treated as a negative element, but rather that their control helps in a positive way in the training of the individual, in this case of future teachers of the three basic levels of education —Infant, Primary and Secondary— with the social importance that this profession entails. Adequate motivation and well-being in teacher training (to meet their needs and avoid frustration) are psychological factors necessary for proper academic and future professional performance, something that this study seeks to highlight.

The university stage is characterised by a period of change and settlement of personality. Students will reinforce their personal characteristics and will face problems and difficulties in the familiar, social, and cultural context in which they live (González et. al., 2019). All the actions and decisions they take will be related to some kind of motivation that will positively or negatively influence the needs and frustrations they experience.

In this sense and based on the Self-Determination Theory (Ryan & Deci, 2017), which explains how motivational processes influence people's behaviour, the aim is to address the issue of motivation-engagement and needs-frustrations in the field of education (teacher training) through a micro-theory that underlies it called basic needs (Ryan & Deci, 2020; Ryan et. al., 2019). This theory states that human beings must have satisfied three psychological needs to ensure a correct motivational development: 1. Autonomy (referring to the decision of actions), 2. Competence (self-perception of obtaining optimal results) and 3. Relatedness (feeling connected and accepted by others in a particular context).

The satisfaction of these three needs implies motivation, growth, and personal well-being, and their lack leads to psychological and individual discomfort that can become a pathology that ends up frustrating the individual (Bartholomew et. al., 2011). This frustration is associated with a series of negative consequences and

poor adaptation in classroom, such as demotivation, lack of interest or boredom (Leptokaridou et. al., 2014; Sánchez-Oliva et. al., 2014).

In a study on the absence of support for Physical Education (PE) teacher autonomy, related to the perception of satisfaction and frustration of this need in which 196 Spanish students from the first cycle of Secondary Education participated, the following instruments were completed: Questionnaire to Support Basic Psychological Needs (CANPB), the Basic Psychological Needs Measurement Scale (BPNES) and the Frustration of Psychological Needs Scale (EFNP). The analysis of the results highlighted the importance of supporting autonomy to meet needs and avoid frustration (Abós et. al., 2016).

Likewise, Cachón et al. (2018) applied the UWES-S scale (*Utrecht Work Engagement Scale*) to 297 Bachelor's Degree Teacher Education students and 96 Master's Degree Secondary Teacher Education students to examine the inference of socio-demographic and personal variables on their commitment to their studies. They conclude that there are significant differences in terms of gender and geographical location of the universities, highlighting that the perception of the performance of their role as a student and as a future teacher is based on motivation. In this regard, Llanes et. al. (2021), following their study of 13939 students in the field of education in Europe and Latin America, include among the predictors of motivation the educational and employment level of parents and the fact of combining studies with work commitments. These authors also argue that intrinsic motivation, which is based on personal satisfaction, is related to greater enthusiasm for university practice.

The relationship between goal content and teaching efficacy beliefs in Master's Degree students has recently been studied and the results suggest that intrinsic goal content at the beginning of the Master's degree had a direct positive effect on one's own teaching efficacy beliefs at the end of the course, highlighting the mediation of academic autonomous motivation (Cachón et. al., 2018).

In Spain, university graduates of any specialisation who study the Master's Degree in Teacher Training can become Secondary Education teachers in their specialisation. However, the Bachelor's Degree in Teaching is specifically aimed at training a student to become an Early Childhood or Primary School Teacher. In the latter case, given that the cut-off values required to enter the studies are accessible, it is expected that the student will become motivated towards teaching throughout their studies. In this sense, Rosales (2014), using the paradigms of active research, teacher thinking and the development of their professional skills, together with ethnography, carried out research based on autobiographical accounts and semi-structured interviews. The results obtained reveal that prospective teachers are very sensitive about what they are taught at university and what they understand they should learn.

To reinforce these approaches, reference should be made to Goleman (1998), who highlights emotional intelligence in the leader as the ability to perceive emotions accurately, to apply emotions to facilitate thinking and reasoning, and to understand the emotions of others and master one's own. In this respect, the initial needs, and possible frustrations of the individual, both in companies and in education, converge in the application of human resources available to improve motivation and the satisfaction that comes from achieving the objective for which the individual has been prepared, highlighting the importance of emotional intelligence as a general capacity for adaptation.

Regarding the academic field, a study by González et. al. (2019) indicates that the satisfaction of needs for autonomy and competence positively predicts enjoyment and that frustration of the need for relatedness predicts demotivation. The *empowering* climate favours the satisfaction of basic psychological needs and, therefore, the development of self-determined motivation (*Self-Determination Theory*; SDT), mainly through the satisfaction of the need for autonomy (Castillo et. al., 2017).

It is for this reason that the study of motivation towards teaching and the psychological needs and frustrations of future teachers can be a great indicator and predictor of how the work in the educational context is developing.

In the area of physical activity and sport, extensive and in-depth research has been carried out that can serve as a reference. There are studies that demonstrate the positive relationship between physical activity and psychological well-being (Sicilia et. al., 2013); and relating to teachers, Sánchez-Oliva et. al. (2014) indicate that high levels of frustration in competition positively predict demotivation, emotional exhaustion and cynicism, and negatively predict intrinsic motivation and professional effectiveness. These authors also showed that frustration with lack of autonomy positively predicted emotional exhaustion and negatively predicted professional effectiveness, but frustration with social relationships positively predicted effectiveness. If the academic background of sports coaches is taken into account, those with the highest academic level show less frustration with needs, value competence and relatedness more highly; that is, with an adequate academic background they feel more capable and better prepared for professional performance in their context (Allen & Hodge, 2006; Pulido et. al., 2017).

Research on basic psychological needs is scarce in the university environment, and even more so with trainee teachers. This lack of scientific literature in the field of teacher training justifies the verification of the questionnaire's scientific validity and the extent of the results obtained after its application.

The aim of this study has been the revalidation of the Basic Psychological Needs Scale in trainee teachers, so that the measurement of motivational psychological variables allows us to verify, with scientific rigour, whether the basic psychological

needs and frustrations of these students can influence their correct academic performance and their professional future.

MATERIALS AND METHODS

Participants

A total of 598 students participated in this study, of whom 141 were studying for the Bachelor's Degree in Early Childhood Education (GEI), 337 for the Bachelor's Degree in Primary Education (GEP) and 120 were studying for the Master's Degree in Secondary Education (MES). The age range was between 18 and 54 years old, with 48.3% under 21 years old, 34.6% between 22 and 25 years old and 17.1% over 25 years old. Looking at the gender breakdown, 31.4% are male and 68.6% are female. 13% are in their first year of studies, 28.4% in their second year, 15.4% in their third year, 23.1% in their fourth year and the remaining 20.1% are enrolled in the Master's Degree. Regarding geographical location, 43% belong to a university in southern Spain (USE), 34.8% to a university in northern Spain (UNE) and the remaining 22.2% to a Chilean university (UCH).

Instrument

The intention of this research has been to adapt and validate the Basic Psychological Needs Scale (S-PNTS) by Bartholomew et. al. (2011), validated in Spanish by Sicilia et. al. (2013) in the physical exercise environment and adapted to physical education students by Cuevas et. al. (2015), for its successful application to trainee teachers. The scale is made up of 12 items, which in turn are grouped into three subscales: *Competence* (COMP), *Autonomy* (AUTON) and *Relatedness* (RELAC). For each item, participants must respond on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) the degree of agreement or disagreement with the questions asked. Before starting the different statistical analyses, taking into account that the items are formulated in a negative sense, the answers have been inverted to facilitate a better interpretation of the results, so that a high value indicates that the students feel competent, autonomous and with a good relatedness in the teaching environment, and low scores would indicate the opposite, considering themselves not very competent, with little autonomy and a bad relatedness in the teaching environment.

Procedure

Before starting the research, permission was sought from the Ethics Committee of the Spanish universities from which the study is based. Once permission was obtained, a letter was sent by email to several universities in Spain and Chile, with which contact had been made in previous research, requesting the collaboration of the faculties that make up the GEI, GEP and MES. Once a favourable response was obtained, three universities were selected for convenience, one in the south and one in the north of Spain and a third in Chile. The link to the questionnaire was sent by e-mail to the teaching staff of these centres so that they could forward it to the students. The questionnaire was preceded by a letter explaining the objectives of the study and requesting collaboration, indicating that participation was voluntary and pointing out the importance of completing all the items. The anonymity of the participants was also guaranteed, underlining that all data and results would be used exclusively for scientific purposes. The link to the questionnaire was open to students for one month, after which time it was closed for data analysis.

Data analysis

The results are presented in two clearly differentiated parts. First, the instrumental research is shown, based on the revalidation of the questionnaire used, since the validation process of any scale should never be considered complete if a proper application is to be guaranteed (Tourón et. al., 2018). Lloret et. al. (2014) recommend the sequential use of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Following these suggestions, it was decided to start with EFA to identify, both in number and composition of common factors or latent variables, necessary to explain the common variance of all items analysed. This was followed by CFA to confirm the appropriateness and revalidation of the scale used in this study. These analyses were carried out using three statistical programmes, SPSS.24, Factor 10.8.01 and MPlus.7.3.

Secondly, the results of the empirical research are presented, setting out the descriptive data for all items and factors and clarifying the inference that some items have on others and on the resulting factors. For this part of the analysis, the statistical software SPSS.24 and G*Power 3.1.9.2 have been used.

RESULTS

In order to verify whether the scale can be used with guaranteed success with trainee teachers, descriptive values, central tendency and dispersion were

calculated for all the items that make up the scale. With respect to skewness and kurtosis, using the range ± 2 (Bandalos & Finney, 2010; Muthén & Kaplan, 1992) all items presented an acceptable distribution. The corrected homogeneity index also presents acceptable values, all values above .400 except item 12 which shows a value of .315. In view of these results, the EFA has been carried out with all the items, but with the relevant reservations about item 12.

Table 1

Central tendency and measures of item dispersion

	M	SD	Var.	Asym.	Kut.	cHI
V1 Siento que me impiden tomar decisiones respecto al modo de estudio / I feel that I am prevented from making decisions about how to study	3.55	1.166	1.360	-0.378	-0.746	.543
V2 Me siento presionado/a comportarme de maneras diferentes / I feel pressured to behave in different ways	3.39	1.306	1.705	-0.284	-1.094	.651
V3 Me siento forzado/a a seguir una determinada forma de estudiar / I feel forced to follow a certain way of studying	3.59	1.295	1.677	-0.443	-1.034	.631
V4 Me siento presionado/a a aceptar la forma de estudiar que me han estipulado / I feel pressured to accept the way of studying that has been stipulated for me	3.52	1.332	1.774	-0.421	-1.090	.647
V5 Hay situaciones que me hacen sentir incapaz / There are situations that make me feel inadequate	3.35	1.312	1.721	-0.238	-1.132	.642
V6. A veces digo cosas que me hacen sentir incompetente / Sometimes I say things that make me feel incompetent	3.69	1.202	1.446	-0.497	-0.864	.683
V7 Hay situaciones que me hacen sentir torpe / There are situations that make me feel clumsy	3.37	1.265	1.601	-0.155	-1.134	.626

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	M	SD	Var.	Asym.	Kut.	cHI
V8 Siento que no estoy a la altura porque no tengo oportunidades para demostrar mi potencial / I feel I am not up to the task because I don't have opportunities to show my potential	3.74	1.260	1.588	-0.727	-0.553	.585
V9 Siento que soy rechazado/a por las personas que me rodean / I feel that I am rejected by the people around me	4.30	1.025	1.052	-1.489	1.535	.647
V10. Siento que los demás pueden ser indiferentes conmigo / I feel that others can be indifferent to me	4.01	1.121	1.256	-0.894	-0.146	.637
V11. Siento que la gente de mi grupo no me agrada / I feel that people in my group do not like me	4.13	1.034	1.069	-1.141	0.708	.444
V12. Siento que otros tienen envidia cuando logro éxitos / I feel that others are envious when I achieve success	3.72	1.238	1.532	-0.585	-0.741	.315

Prior to conducting the EFA, it was checked whether the study participants came from populations with the same variance, as well as whether they had an acceptable sample adequacy. For this, both Bartlett's statistic and the Kaiser-Meyer-Olkin test were applied. The results show a good fit to the data [Bartlett's statistic = 5556.7 (df = 66; $p = .000010$), (KMO = .856)].

The data recording has been ordinal (Likert scale from 1 to 5); therefore, it is considered convenient to use the robust estimation of unweighted least squares (ULS) for the extraction of factors in the EFA. The values obtained in the distribution, skewness and kurtosis tests show that some items exceed the value one, indicating a slightly high skewness and kurtosis, therefore, it is recommended to apply polychoric correlations (Muthén & Kaplan, 1985; Muthén & Kaplan, 1992).

To determine the number of factors, the optimal implementation method of parallel analysis proposed by Timmerman & Lorenzo (2011) was run, carrying out 10000 resamples. The EFA shows an extraction of three factors, which explain 79% of the variance. As for the data derived from the goodness-of-fit index (GFI = .998) and the residual root mean square (RMSR = .054), following the indications of García-

Cueto et. al. (1998), they present a good fit of the three-dimensional structure for these items.

The results of the rotation (Promin) reveal that one of the items does not reach .300; therefore, it does not load on any of the factors and also presents a low communality, this is the reason why it has been decided to dispense with this item (V12) and carry out a new rotation with the other 11, thus showing adequate loading values. The reliability index of each factor has also been calculated (Cronbach's alpha for ordinal data) and all three have exceeded .700 (Elosua & Zumbo, 2008).

The final scale, consisting of 11 items, is divided into three factors, F1: Autonomy (AUTON), F2: Competence (COMP) and F3: Relatedness (RELAC). See Table 2.

Table 2

Rotated loading matrix of all variables, communality, rotated loading matrix after dropping one variable and Cronbach's alpha of each factor

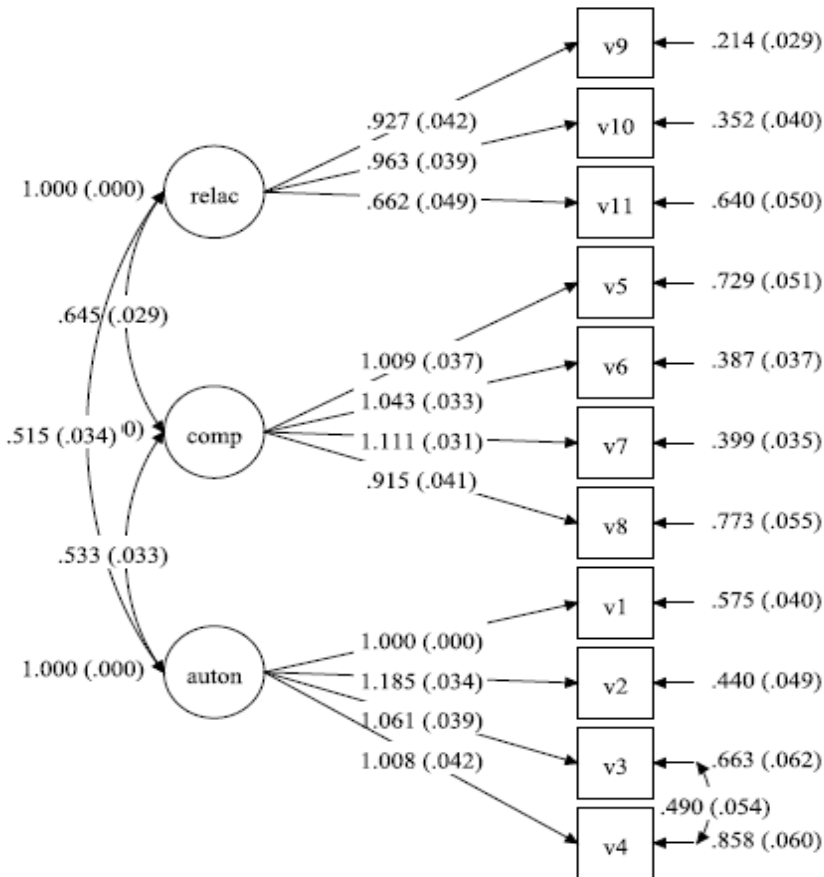
	F1	F2	F3	Com.	AUTON	COMP	RELAC
V1	.718	.158	-.106	.557	.721		
V2	.767	.066	.051	.690	.768		
V3	.908	-.037	-.075	.909	.907		
V4	.868	-.017	.046	.783	.863		
V5	.182	.733	-.052	.641		.714	
V6	.100	.817	.010	.768		.811	
V7	-.086	.918	-.065	.881		.932	
V8	-.002	.684	.132	.603		.674	
V9	.012	.065	.896	.896			.917
V10	.035	.032	.846	.787			.833
V11	-.058	-.103	.812	.517			.800
V12	.243	-.028	.254	.175			-
Cronbach's alpha					.882	.873	.831

The MPlus.7 program has been used to verify and corroborate the results obtained in the EFA. MLM has been used as estimator. The values of the comparative fit index (CFI) and the Tucker-Lewis index (TLI) were lower than .95, the root mean squared error of approximation (RMSEA) reached .080 and the standardised root mean square residual (SRMR) obtained a value of .09. Not having reached adequate values and following the recommendation of experts (Byrne, 2001; Hu & Bentler, 1999) that $RMSEA \leq .08$, $CFI \geq .95$, $TLI \geq .95$ and $SRMR \leq .05$, the model has had to be refitted. This re-fitting has shown that variable 4 loads on variable 3, thus, the model has been re-specified to obtain a better fit. See Table 3 and Graph 1.

Table 3
Values of the fit indices of the confirmatory factor analysis

	χ^2	p	RMSEA	IFC	TLI	SRMR
Adjusting the value of the indices of the original model	250.281	.00	.09	.940	.922	.09
Adjust the value of the re-specified model indices	139.949	.00	.06	.972	.962	.05

Figure 1
Estimated parameters for the re-specified model



Once the fit of the questionnaire had been checked and the factors defined, a 2x3 multivariate analysis of variance (MANOVA) was carried out to determine whether the interaction between the variables sex and the three age groups into which the participants were divided jointly affects the three factors under study. The results obtained showed a statistically significant interaction effect ($\lambda = .963$, $F_{(6, 1180)} = 3.731$, $p \leq .001$, $\eta^2 = .019$, $1-\beta = .963$).

Univariate analyses have shown statistically significant differences in the sex variable in two factors: in AUTON, females score significantly higher with a mean difference (MD) = 0.31 and an effect size (d) = 0.38, ($F = 9.369$, $p \leq .005$, $\eta^2 = .016$, $1-\beta = .863$); in COMP males obtain statistically significantly higher scores MD = 0.244, $d = 0.18$, $F = 5.946$, $p \leq .05$, $\eta^2 = .010$, $1-\beta = .862$).

Taking into account the age variable also in the same factors, younger participants (18-21 years) score statistically significantly higher in AUTON than those aged 22-25 years, with a MD = 0.404 and $d = 0.38$, ($F = 6.684$, $p \leq .001$, $\eta^2 = .022$, $1-\beta = .914$); in COMP, those aged 18-21 score higher than those over 25, with MD = 0.371 and $d = 0.38$, ($F = 6.614$, $p \leq .001$, $\eta^2 = .022$, $1-\beta = .912$).

Subsequently, a 3x3 MANOVA analysis was performed (participants' major of study x geographical area of university of origin). The results obtained showed a statistically significant interaction effect ($\lambda = .961$, $F_{(9, 1431)} = 2.627$, $p \leq .05$, $\eta^2 = .013$, $1-\beta = .885$).

The univariate statistics show statistically significant differences in the variables of the three factors studied. If we consider the major studied, in AUTON of the GEI with respect to those of the GEP show statistically significant differences with a MD = 0.523, $d = 0.43$ and between GEI and MES students the MD = 0.505 and $d = 0.37$, favourable to the GEI ($F = 11.520$, $p \leq .001$, $\eta^2 = .038$, $1-\beta = .897$); in COMP, GEP students score lower than the other two majors ($F = 10.374$, $p \leq .001$, $\eta^2 = .034$, $1-\beta = .988$), namely with those from GEI the MD = 0.492, $d = .30$, and with those from MES the MD = 0.289, $d = 0.22$; in RELAC, MES students scored statistically significantly higher than GEP students with a MD = 0.319 and a $d = .27$ and GEI students scored higher than GEP students with a MD = 0.277 and a $d = 0.17$ ($F = 8.220$, $p \leq .001$, $\eta^2 = .027$, $1-\beta = .961$).

Looking at the home university variable, the results on the AUTON factor indicate that there are statistically significant mean differences, with UCH participants scoring lower compared to USE, showing a MD = 0.673, $d = 0.70$, and to UNE, MD = 0.533, $d = 0.46$ ($F = 17.371$, $p \leq .001$, $\eta^2 = .056$, $1-\beta = 1.000$); at COMP, at USE students show lower values than at UNE (MD = 0.262, $d = 0.13$, and than those at UCH, with a MD = 0.284, $d = 0.18$ ($F = 4.483$, $p \leq .005$, $\eta^2 = .015$, $1-\beta = .767$); in RELAC there are statistically significant differences between USE and UNE means with both universities showing higher scores than UCH ($F = 6.246$, $p \leq .05$, $\eta^2 = .021$,

$1-\beta = .894$), with the comparison between UCH and USE showing a $MD = 0.291$, $d = 0.38$, and between UCH and UNE a $MD = 0.297$, $d = 0.35$.

DISCUSSION AND CONCLUSIONS

The main objective of this study has been to revalidate the scale of basic psychological needs (S-PNTS) in order to apply and obtain results with guaranteed success in trainee teachers, and that the measurement of motivational psychological variables allows us to verify whether the basic psychological needs and frustrations of these students can influence their correct academic performance and their professional future.

The factor structure of the scale of basic psychological needs applied to trainee teachers corroborates with sufficient empirical support the relevance of the three factors established by previous studies (Autonomy, Competence and Relatedness). However, item 12 corresponding to the Relatedness factor has been eliminated as it did not reach minimum values in the factoring process. On the other hand, in the confirmatory factor analysis, the model had to be re-specified as it did not reach the minimum values required in the different indices, and the results obtained show that variable 4 loads on variable 3, possibly due to the redundancy in its wording.

There are few studies on the basic psychological needs of university students and even fewer of trainee teachers; they are usually studied globally, without comparing the results by gender, age, major or geographical location and country of the participating universities. It is the study of these variables that makes the research more novel.

The participants revealed scores above the mean value of the scale in all three factors, a result that corroborates the work of Sicilia et. al. (2013), giving the lowest value in the factor referring to the perception of autonomy allowed during their studies. This factor is an important basic need for trainee teachers, as feeling free to learn is of great value in satisfying needs and avoiding frustration (Abós et. al., 2016). As indicated by Sánchez-Oliva et. al. (2014), frustration due to a lack of autonomy presages emotional exhaustion and professional ineffectiveness, therefore, knowing how to act autonomously and sovereignly is a primary reason for exercising the teaching profession. With regard to the competence factor, in the present study, men obtain a higher score than women, an issue that corroborates the results obtained by Zamarripa et. al. (2016), but nevertheless, in the aforementioned study, the estimate they give in relation to age indicates that, in autonomy and competence, the older the age, the higher the score, which does not correspond to those obtained in the present study, where younger people are the ones who give higher scores in both factors.

Likewise, in perception of competence, students from the University of southern Spain score lower than those from the other universities studied, with those from the University of Chile scoring higher and, on the contrary, the opposite is true for autonomy and relatedness. In a recent study presented by Cachón et. al. (2018), students from southern Spain are more satisfied and more predisposed to study than those from the University of northern Spain, and those from the Chilean University are more satisfied with their studies than those from the University of northern Spain, that is, students from southern Spain feel less competent, more autonomous, perceive a better relatedness and are more satisfied and predisposed to study than those from the universities of northern Spain. It would be useful to check whether those students who perceive a higher level of autonomy in their studies, and a better relatedness between classmates, can influence their predisposition and satisfaction with their studies.

Primary Education teachers score lower than Pre-school and Secondary Education teachers in all three factors studied, thus showing an approach closer to frustration. Perhaps the students in this major do not have the same defined professional profile as the other two, i.e. Early Childhood Education is focused on education at the level of 3 to 6 years, Secondary Education students are training didactically in the major they have studied beforehand, while Primary Education students are general teachers, while those in Primary Education are generalist teachers who can teach any subject in an age range of 6 to 12 years, and although they may take some specialisation ECTS credits, these are insufficient and do not adequately prepare them to face the educational work that awaits them at the end of their degree studies.

The need to motivate trainee teachers is explained by the improvement of the three factors under study. The satisfaction of basic psychological needs, —autonomy, competence and relatedness— produces personal well-being and as a consequence the suppression of frustration (Bartholomew et. al., 2011). Frustration leads to demotivation and boredom (Leptokaridou et. al., 2014; Sánchez-Oliva et. al., 2014). Those responsible for teacher education must understand that a frustrated teacher cannot transmit motivation to students, and these future educators must finish their university studies prepared to accept and overcome the frustrations they will face throughout their professional life.

This study does not represent an end, but rather a point and a continuation, keeping the door open for further research. For this reason, it is necessary to replicate the questionnaires by increasing the number of participants, both from Spain and Latin America, and even with students from different European countries, in order to guarantee the suitability of the scale. It is also considered important to consider new socioeconomic, occupational, and educational variables to test possible inferences about the factors studied, as well as longitudinal studies with

innovative intervention programmes for the improvement of basic psychological factors and frustration avoidance, as well as observing other factors that may predict these constructs.

The conclusions of the factor analyses carried out indicate that the scale can be used by eliminating one variable from the original scale, and without it the results will be sufficiently powerful to consider the scale satisfactory, maintaining the three original factors, Autonomy, Competence, Relatedness, the first two made up of four variables and the third of three.

REFERENCES

- Abós, A., Sevil, J., Sanz, M., Aibar, A., & García-González, L. (2016). Autonomy support in PE as a means of preventing students' defiant opposition. *RICYDE. International Journal of Sport Sciences*, 12(43), 65-78. <https://doi.org/10.5232/ricyde2016.04304>
- Allen, J. B., & Hodge, K. (2006). Fostering a Learning Environment: Coaches and the Motivational Climate. *International Journal of Sports Science & Coaching*, 1(3), 261-277. <https://doi.org/10.1260%2F174795406778604564>
- Bandalos, D. L., & Finney, S. J. (2010). Factor analysis: Exploratory and confirmatory. In G.R. Hancock & R.O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the Social Sciences* (pp. 93-114). Routledge.
- Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., Bosch, J. A., & Thøgersen-Ntoumani, C. (2011). Self-determination theory and diminished functioning: the role of interpersonal control and psychological need thwarting. *Personality and Social Psychology Bulletin*, 37(11), 1459-1473. <https://doi.org/10.1177%2F0146167211413125>
- Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., & Thøgersen-Ntoumani, C. (2011). Psychological need thwarting in the sport context: Assessing the darker side of athletic experience. *Journal of Sport and Exercise Psychology*, 33(1), 75-102. <https://doi.org/10.1123/jsep.33.1.75>
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. Lawrence Erlbaum Associates.
- Cachón, J., Lara, A., Zagalaz, M. L., López, I., & González, C. (2018). Psychometric properties of the Utrecht Work Engagement Scale in education students. *Suma Psicológica*, 25, 113-121. <https://doi.org/10.14349/sumapsi.2018.v25.n2.3>
- Castillo, N., López-Walle, J., Tomás, I., & Balaguer, I. (2017). Relationship of the empowering climate with self-determined motivation through the satisfaction of basic psychological needs. *Journal of Sport Psychology*, 26(3), 36-39.
- Cuevas, R., Sánchez-Oliva, D., Bartholomew, K. J., Ntoumanis, N., & García-Calvo, T. (2015). Adaptation and validation of the Psychological Need Thwarting Scale

- in Spanish Physical Education Teachers. *The Spanish Journal of Psychology*, 18(E53). <https://doi.org/10.1017/sjp.2015.56>
- Elosua, P., & Zumbo, B. D. (2008). Reliability coefficients for ordered categorical response scales. *Psicothema*, 20(4), 896-901.
- García-Cueto, E., Gayo-Álvaro, P., & Miranda-García, R. (1998). Goodness of fit in confirmatory factor analysis. *Psicothema*, 10(3), 717-724.
- Goleman, D. (1998). *Working with emotional intelligence*. Bantam.
- González, L., Castillo, I., & Balaguer, I. (2019). Exploring the role of resilience and basic psychological needs as antecedents of enjoyment and boredom in female sports. *Journal of Psychodidactics*, 24(2), 131-137.
- González, G., Zurita, F., Pérez, A. J., Padial, R., Ubago, J. L., & Chacón, R. (2019). Descriptive study of the perceived motivational climate towards sport according to the sex of future Physical Education teachers. *Sportis: Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad*, 5(1), 85-100. <https://doi.org/10.17979/sportis.2019.5.1.3479>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
- Leptokaridou, E. T., Vlachopoulos, S. P., & Papaioannou, A. G. (2014). Experimental longitudinal test of the influence of autonomy-supportive teaching on motivation for participation in elementary school physical education. *Educational Psychology*, 36(7), 1138-1159. <https://doi.org/10.1080/01443410.2014.950195>
- Llanes-Ordóñez, J., Méndez-Ulrich, J. L., & Montané López, A. (2021). Motivation and academic satisfaction of education students: an international view. *Educación XX1*, 24(1), 45-68. <http://doi.org/10.5944/educXX1.26491>
- Lloret, S., Ferreres, A., Hernández, A., & Tomás, I. (2014). The exploratory factor analysis of items: a practical, revised and updated guide. *Anales de Psicología*, 30(3), 1151-1169. <https://doi.org/10.6018/analesps.30.3.199361>
- Muthén, B., & Kaplan, D. A. (1985). Comparison of some methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology*, 38(2), 171-189. <https://doi.org/10.1111/j.2044-8317.1985.tb00832.x>
- Muthén, B., & Kaplan, D. A. (1992). Comparison of some methodologies for the factor analysis of non-normal Likert variables: A note on the size of the mode. *British Journal of Mathematical and Statistical Psychology*, 45(1), 19-30. <https://doi.org/10.1111/j.2044-8317.1992.tb00975.x>
- Pulido, J. J., Sánchez-Oliva, D., Leo, F. M., González-Ponce, I., & García-Calvo, T. (2017). Psychological needs frustration, motivation and burnout in coaches: Incidence of training. *Journal of Sport Psychology*, 26(1), 27-36.

- Rosales, C. (2014). What will my teaching profession be like? *Pedagogical Trends*, 23, 29-44.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publishing.
- Ryan, R. M., & Deci, E. L. (2019). Brick by brick: The origins, development, and future of self-determination theory. In A. J. Elliot (Ed.), *Advances in motivation science* (vol. 6, pp. 111-156). Elsevier.
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 1-11.
- Ryan, R. M., Ryan, W. S., Di Domenico, S. I., & Deci, E. L. (2019). The nature and the conditions of human autonomy and flourishing: Self-determination theory and basic psychological needs. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (2nd ed., pp. 89-110). Oxford University Press.
- Sánchez-Oliva, D., Sánchez-Miguel, P. A., Pulido, J. J., López, J. M., & Cuevas, R. (2014). Motivation and burnout in physical education teachers: Incidence of the frustration of basic psychological needs. *Cuadernos de Psicología del Deporte*, 14(3), 75-82.
- Sánchez-Oliva, D., Sánchez-Miguel, P. A., Leo, F. M., Kinnafick, F. E., & García-Calvo (2014). Physical education lessons and physical activity intentions within Spanish secondary schools: A Self-Determination perspective. *Journal of Teaching in Physical Education*, 33(2), 232-249. <https://doi.org/10.1123/jtpe.2013-0043>
- Sicilia, A., Ferriz, R., & Sáenz-Álvarez, P. (2013). Spanish validation of the psychological needs frustration scale (EFNP) in physical exercise. *Psychology, Society & Education*, 5(1), 1-19.
- Timmerman, M. E., & Lorenzo-Seva, U. (2011). Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychological Methods*, 16(2), 209-220. <https://doi.org/10.1037/a0023353>
- Tourón, J., Martín, D., Navarro-Asencio, E., Pradas, S., & Íñigo, V. (2018). Construct validation of an instrument to measure teaching digital competence (TDC). *Revista Española de Pedagogía*, 76(269), 25-54. <https://doi.org/10.22550/REP76-1-2018-02>
- Zamarripa, J., & Castillo, I., Tomás, I., & López-Walle, J. (2016). Mexican validation of the basic psychological needs support questionnaire in Physical Education. *Revista Mexicana de Psicología*, 33(2), 143-150. <https://www.redalyc.org/articulo.oa?id=243056044006>

