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The Importance of the Phoenix Bird Technique (Resilience) in Teacher Training: CD-RISC Scale Validation

Javier Cachón Zagalaz [1], Inés López Manrique [2], María Belén San Pedro Veledo [2,*], María Luisa Zagalaz Sánchez [1] and Carmen González González de Mesa [2]

[1] Department of Didactic of Music, Plastic and Corporal Expression, University of Jaén, 23071 Jaén, Spain; jcachon@ujaen.es (J.C.Z.); lzagalaz@ujaen.es (M.L.Z.S.)
[2] Department of Education Sciences, University of Oviedo, 33005 Oviedo, Spain; lopezines@uniovi.es (I.L.M.); gmcarmen@uniovi.es (C.G.G.M.)
* Correspondence: pedromaria@uniovi.es

Received: 13 January 2020; Accepted: 27 January 2020; Published: 30 January 2020

Abstract: Resilience is a personal characteristic or trait that is revealed in situations in which the individual shows high adaptation mechanisms. It is not a state of stress immunity but the ability to adapt to different circumstances. This characteristic is highly important for future teachers and their teaching activities. To analyze resilience levels of future teachers of nursery, primary and secondary education. First, this study is ainstrumental research carried out to revalidate the CD-RISC (Connor-Davidson Resilience Scale) for teachers in training, and second, based on the foregoing results, it is a non-experimental empirical study. The participants were 373 students of degrees in Early Childhood Education, Primary Education, and a Master's Degree in Secondary Education from two Spanish Universities and a Chilean university. Exploratory and a confirmatory factorial analysis were sequentially used to identify the number and composition of factors, and central tendency and dispersion tests, analysis of variance, and effect size were calculated. The programs and statistical tests used were SPSS.22, FACTOR.10.8.01, M-Plus.7.3, and G*Power 3.1.9.2. The instrumental research revealed a bifactorial distribution, resistant personality, resources and control. Females, older individuals, and those who attend primary education showed higher resilience levels than males, younger people, and children in early childhood education.

Keywords: CD-RISC; Teacher Training; Resilience; Factor Analysis

1. Introduction

The phoenix is a beast from Greek mythology, which, from time to time, burnt and reemerged from its own ashes. Its origin is the Garden of Eden, at the bottom of the Tree of Good and Evil, where it burnt for the first time, later blossoming from the flames. Originally mentioned by Hesiod in the eighth century BC, and subsequently in further explanations by the historian Herodotus, the myth of the phoenix spread among the Greeks, who gave it the name of Phoenicoperus (red wings). It has been depicted in most well-known cultures, including the Chinese, Japanese, Russians (the firebird, musically immortalized by Stravinsky), Egyptians (the Bennu who, according to Ovid, died and was reborn every 500 years), Hindus, and Indigenous American like the Aztecs, the Mayans, and the Toltecs (Quetzal).

More recently, Viktor Frankl (1905–1997), neuropsychiatrist and founder of Logotherapy, compared the myth of the phoenix to a traumatic experience, which, although always negative, will lead to an outcome that will depend on each individual (resilience). The philosopher Carl G. Jung (1875–1961) explained the similarities between the human being and the phoenix, stating that the iconic creature of fire, which could rise up majestically from the ashes of its own destruction,

symbolizes the power of resilience and the ability to renew oneself in order to become stronger, braver, and more radiant beings [1]. Therefore, resilience is a strengthening characteristic that helps people to overcome negative events. Therefore, its importance as a teacher training technique.

The term resilience does not have a single valid definition. There are several theoretical frameworks linked to the knowledge of this construct. Ponce defines it as the process of negotiation, management, and adaptation to significant trauma or stress sources [2]. According to this author, the CD-RISC (Connor-Davidson Resilience Scale) is one of the most widely used instruments to evaluate resilience, and there are studies of its psychometric properties in a broad range of countries, although there is no consensus about the internal structure of the scale. Another instrument is the Resilience Scale for Adults of Friborg, Barlaug, Martinussen, Rosenvinge, and Hjemdal [3,4], according to the review of rankings made by Windle, Bennet, and Noyes [5].

In the last few years, there have been an increasing number of studies about resilience as a result of the observation of some individuals who remain calm under stressful situations where others develop psychiatric disorders. The ability to cope with these situations may be related to personal determinants or environmental and social factors [6]. Therefore, the study of these factors in the field of teacher training becomes an outstanding aspect of the analysis of these future professionals' characteristics.

According to McGinnis, resilience is the psychological capacity to face adversities and overcome them positively, returning to levels of well-being prior to the negative event [7]. This is the measure of the ability to prevail over a stressful situation. Therefore, resilience is not a situation of immunity to stress but rather refers to the individual's ability to adapt well to the situation. Not everyone is resilient, nor do they react similarly in the face of a setback. Resilience is a characteristic that depends on several factors, such as previous experiences, context, age, and gender, among others. That is why this construct is considered as a dynamic process, involving internal and external factors interacting with each other, creating a mechanism that makes it possible to face circumstances positively [8,9]. Moreover, a person's resilience can change over the years; they may be able to be resilient during a certain period of life and cease being resilient in another, or vice versa [10]. On the other hand, resilience is one of the main dimensions linked to good academic results and psychological well-being. The study of this construct originated when some children were perceived to present no psychological disorders after having suffered adverse situations but instead were strengthened after facing them [11].

Likewise, positive resilience during the university stage is of paramount importance, as it encourages students to fulfill their academic obligations, enabling a positive progress that helps to deal with the pressure of studying [12]. The concept is closely and positively related to commitment to studying and to academic achievement, influencing the mental health and well-being of university students. Therefore, this study seeks to analyze its impact on teacher training at any education level. The ability to know how to cope with stress and anxiety is a key tool for university students, as higher levels of both variables are linked to lower grades and motivation. In this regard, authors such as Calzada, Cachón, Lara, and Zagalaz link this ability to physical activity practice in school-age students [13]. However, despite the importance of resilience during the university stage, there are very few papers that have researched it in this educational period [14]. Stallman's paper suggests that 83.9% of Education Degree students surveyed showed high stress and levels of anxiety [15]. Likewise, the United Kingdom Royal College of Psychiatrists claimed that 29% of Education Degree students suffered from high levels of stress and perceived anxiety [16]. In this sense, according to surveys conducted to different samples of students from the Degrees in Early Childhood Education (ChE) and Primary Education (PE) at the University of Jaén (UJA) are afraid of their first teaching practices to be performed in schools [17].

Focusing on these aspects, various psychologists have suggested that perceived anxiety can be considered as arousal or a positive emotion that maintains or improves performance [18–20]. This was indicated by Kokotsaki and Halman, cited in Tamborrino, when referring to singers and their improvement of anxiety [21]. In this sense, a positive anxiety modality could exist, which would not interfere negatively with performance, as demonstrated in sports events [22].

Given the abovementioned facts, among the different factors that interact with resilience, gender must be underscored, as male gender seems to have higher levels of resilience. According to Allan, McKenna, J., and Dominey, boys support problems related to mental health better, as they are more reluctant to share them with others, showing an image of invulnerability, self-sufficiency, and sometimes bluster [23]. Conversely, girls appear more sociable in this sense and more likely to express their feelings and thoughts to their acquaintances, although they are also prone to internalize failure. Ramírez and Castro agree with these authors when they assert that boys show higher levels in all dimensions of resilience [24].

Erdogan, Ozdogan, a d Erdogan claim that, in relation to gender and resilience, male university students show higher levels of resilience than females [25]. The study of Zurita, Chacón, Castro, Gutiérrez-Vela, and González-Valero also confirms that males have higher levels of resilience in personal capacity and the tenacity dimension, more self-confidence and tolerance of adversity, and positive acceptance of changing situations, whereas females show higher scores in the rest of the factors [26]. Spirituality is relevant to understand how resilience enables people to seek higher and better goals. Resilience helps people to achieve a better quality of life and to seek those purposes [27]. In this sense, the results of Ponce´s study in a sample of Spanish and Chilean university students show strong similarities, with the greatest difference in the spiritual aspect, which was the only specific stable factor in both samples [2].

Guerra examined the issue of resilience of teachers, stating that PE teachers have lower levels of resilience whereas ChE teachers have the highest levels [28]. This approach contradicts the abovementioned authors' statements that males have a higher capacity of resilience, as, according to data from Andalusian universities, most of ChE students are female, reaching percentages of 97%.

Self-concept is related to resilience capacity and is important in teacher training. Cachón, Cuervo, Zagalaz, and González carried out a study on the relation between sports practice and the dimensions of self-concept, taking into account gender and the specialty of the students' teaching degrees [29]. The results show that the physical dimension of self-concept is positively correlated to the number of hours spent doing sports practice, with males and students of PE Degree obtaining higher scores. Likewise, it is significantly correlated with academic, social and family dimensions.

Chen, Maoa, Kong, Li, Xin, Lou, and Li studied 125 schizophrenic patients' family-caregivers in a Chinese hospital, applying the Kessler Psychological Relief Scale (K10), the Perceived Devaluation Discrimination Scale (PDD) of Link [30], and the Resilience Scale of Connor-Davidson (CD-RISC-10) to measure caregivers' psychological distress, stigma, and resilience, respectively [31]. These authors demonstrated for the first time that resilience moderates the association between caregivers' stigma and psychological distress and that promoting resilience could be helpful to relieve their psychological distress, especially in those caregivers who had higher levels of stigma.

In recent years, the CD-RISC has been adapted and revalidated in different contexts, ages, and countries, but no clear consensus has been reached on the number of items and factors. It is remarkable that this is one of the most widely used tools to evaluate this construct although its joint validity for diverse situations, nationalities, or cultures has not been proven.

Thus, this study aims to evaluate the psychometric characteristics and factor structure of the Spanish version of the CD-RISC in a sample of training teachers. It also aims to examine the possible impact of gender, age, and the future teachers' specialty and university of origin in order to determine its possible usefulness with guarantees of success in the professional teaching context.

2. Materials and Methods

2.1. Participants

Participants were 373 individuals studying a degree in ChE and PE (second year of teacher training) or a Master's degree in Secondary Education (SE) (first year of teacher training). Of them, 196 were PE students, 85 were ChE students, and 92 were SE students. Regarding distribution by gender, 94 are males and 279 are females. The ages range between 19 and 51 years, M = 23.12, SD = 5.330. They were divided into three groups for this work. One group was composed of 105 people

under 21 years old, another group was made up of 163 people between 21 and 24 years old, and the last group included the remaining 105 students, over 24 years old. Concerning their origin, 257 participants were students from a university in southern Spain (USS), 100 were from a university of northern Spain (UNS), and 15 were from a university of Chile (UCH). It should be noted that the sample used was for convenience, and participation in the investigation was voluntary.

2.2. Instrument

The instrument used was the Connor-Davidson Resilience Scale (CD-RISC), which is currently the most widely used scale to measure this construct [8]. This instrument was originally divided into five factors, the first one refers to personal competence, high standards and tenacity; the second factor reflects confidence in one's intuition, tolerance of negative effects, and strength in the face of stress; the third factor is linked to positive acceptance of change and secure relationships; the fourth factor is related to control; and the fifth factor refers to spirituality. The CD-RISC consists of 25 items, although a reduced version of just 10 items (CD-RISC-10) and another version with two items (CD-RISC-2) are also available. The 10-item version refers to resilience as a one-dimensional concept, conversely to the initial 25-item version. It should be noted that in the present study the 25-item scale has been used, with a Likert scale of 1–5, where 1 strongly disagree and 5 strongly agree.

The items and item numbers (compared to the CD-RISC) of the CD-RISC-10 are as follows: 1. Ability to adapt to change, 4. Ability to face the issues and challenges, 6. See the funny side of things, 7. Come out stronger from adversity, 8. Recover when facing diseases or difficult situations, 11. Confidence in achieving proposed goals, 14. Thinking clearly under pressure, 16. Not being discouraged by failure, 17. Self-image of a strong person, and 19. Ability to handle unpleasant emotions [32].

The items of the CD-RISC-2 are as follows: 1. Able to adapt to change and 8. Tendency to recover after an illness or a difficulty. These elements were selected by the scale's creators, as they etymologically captured the essence of resilience, in other words, the ability to rebound and adapt to change successfully [33].

Allan, McKenna, and Dominey consider that the original version of 25 items is suitable to be used with older adolescents or university students in the educational context, as reflected in the research carried out in schools from the Basque Country with 1250 adolescents aged between 12 and 15 years old [23]. Positive correlations of resilience (CD-RISC-25) with self-concept and perceived social support were found [34].

There is an increasing body of literature on the CD-RISC, which has been translated to many languages and studied in a wide range of populations, including a large number of community samples, different trauma survivors, Alzheimer's caregivers, adolescents, older people, patients receiving treatment for post-traumatic stress disorder, members of different ethnical and cultural groups, and selected professional, artistic, or sporting groups. In addition, the CD-RISC is included in studies of functional neuroimaging, genotype studies, and studies evaluating treatment outcome. The psychometric properties of the CD-RISC are maintained in many studies, although its factorial structure and average score vary depending on the context, as can be seen in the following research results.

The CD-RISC has been validated in different populations, for instance, in the work of Serrano-Parra, Garrido-Abejar, Notario-Pacheco, Bartolomé-Gutiérrez, Solera-Martínez, and Martínez-Vizcaino, who validated the survey for a group of older people between 60 and 75 years old, specifying five factors [35]. Crespo, Fernández-Lansac, and Soberón adapted the scale to the Spanish population among 111 family caregivers of older dependent people and found four factors [36]. Manzano and Ayala examined the psychometric properties of the CD-RISC in a sample of 900 Spanish entrepreneurs, conducted by telephone survey, and found three factors [37]. They concluded that it is a reliable and valid tool to measure the resilience of this sector of population. Likewise, Fernández-Martínez, Andina-Díaz, Fernández-Peña, García-López, Fulgueiras-Carril, and Liébana-Presa [38] and Riveros, Bernal, Bohórquez, Vinaccia, and Margarita [39] used this instrument in their study to measure resilience in university students, reducing it to a single factor.

In the present study, we intend to revalidate this scale by studying teachers in training to be able to use the instrument with a guarantee of success.

2.3. Procedure

First, the permission of the Ethical Committees of the Universities involved in the study was obtained. Then, an e-mail was sent to different Spanish and Chilean faculties that provided teacher training in the three levels under study, explaining the objectives of the study, and requesting their collaboration. After obtaining affirmative replies, the link of the questionnaire was sent by e-mail to several teachers of the aforementioned centers, requesting them to pass on the questionnaires to the trainees. An explanatory letter requesting their participation was attached to the questionnaire, presenting the objectives and the aim of the study, indicating that the data would be processed only with scientific purposes, and ensuring their anonymity. Regarding informed consent, it should be noted that the letter of introduction to the respondents contained a text requesting collaboration and that if they completed the survey it was because they agreed to do so, since it was voluntary and all were of legal age and did not need permission from their parents.

The questionnaire was open to the trainees for a period of one month, after which data collection was concluded and the data were analyzed.

2.4. Data Analysis

An instrumental research was carried out in this study to revalidate the CD-RISC scale with teachers in training, and subsequently, a non-experimental empirical research was completed using the results. The reason for the instrumental research was the fact that this scale has been widely used and revalidated in different contexts and with different ages, finding different factors depending on each case. In this paper, we study the resilience of future teachers who will be in charge of the formation of youngsters between ages 3 and 18. The resilience level of these future teachers could be one of the most important components to becoming good educators. Hence, the importance of guaranteeing the reliability and validity of the obtained data and avoiding errors in the presentation of the results or when making a diagnosis without having previously verified the reliability of the measurement scale.

Following the suggestions of Lloret, Ferreres, Hernández, and Tomás, exploratory factorial analysis (EFA) and confirmatory factorial analysis (CFA) were used sequentially [40]. First, EFA was conducted to identify the number and composition of the factors, as well as the common variance of all of the variables used. Subsequently, CFA was is used to confirm the adaptation and revalidation of the CD-RISC for application to teachers in training.

The following programs and the statistical test were used.

The SPSS.22 program was used to calculate the univariate statistics for each item of the scale, means, standard deviation, asymmetry, kurtosis, and corrected homogeneity index in order to obtain the recommended number of factors. And was used to calculate the reliability, Cronbach's alpha coefficient for ordinal data.

The FACTOR.10.8.01 program was used to obtain the number of factors designated:

- The method of Parallel Analysis. The implementation suggested by Timerman and Lorenzo-Seva was elaborated with 10.000 re-samplings [41].
- EFA, using the polychoric correlations between variables.
- Factoring, the non-weighted least squares method, with Promin rotation, was used [41–43].

The M-Plus 7.3 program was used to calculate the CFA, means replication of the estimated parameters and re-specification the model if necessary.

The G* Power 3.1.9.2 Program was used to calculate the effect size (Cohen's *d*).

After conducting the EFA and the CFA, the empirical study was performed. The statistical tests and programs, performed with the SPSS.22 program, are presented below.

- Check the equality of variations (Levene´s test).
- Inferential analysis, Student's t and Analysis of Variance (ANOVA).

3. Results

3.1. Instrumental Research

A descriptive analysis of the items that make up the scale was performed, finding that the distribution of Items 5 and 25 present skewness and kurtosis values that exceed ± 2, the value recommended by Bandalos and Finney [44], Muthén and Kaplan [45], and Muthén and Kaplan [46]. The rest of the items presented an acceptable distribution. The corrected homogeneity indexes were adequate, all of them over .200 (see Table 1).

Table 1. Central tendency and dispersion measures of the items of the CD-RISC.

	M	Md	SD	Skewness	Kurtosis	cHI
V1. Soy capaz de adaptarme a los cambios (I can adapt to changes)	4.17	4.00	0.877	−1.272	2.150	0.494
V2. Tengo relaciones cercanas y seguras (I have close and safe relationships)	4.21	4.00	0.806	−1.079	1.537	0.498
V3. A veces el destino puede ayudar (Sometimes destiny can help)	3.73	4.00	1.109	−0.649	−0.189	0.372
V4. Puedo afrontar lo que venga (I can face whatever comes)	4.11	4.00	0.824	−0.845	0.697	0.648
V5. Los éxitos pasados dan confianza para los nuevos retos (Past successes give confidence for new challenges)	4.48	5.00	0.732	−1.764	4.536	0.585
V6. Veo el lado divertido de las cosas (I see the fun side of things)	4.08	4.00	0.916	−0.987	0.878	0.662
V7. Hacer frente al estrés fortalece (Coping with stress strengthen)	3.88	4.00	0.964	−0.834	0.587	0.572
V8. Tiendo a recuperarme tras una enfermedad o dificultad (I tend to recover after an illness or difficulty)	4.18	4.00	0.814	−0.984	1.047	0.529
V9. Las cosas ocurren por una razón (Things happen for a reason)	4.03	4.00	1.035	−1.064	0.748	0.376
V10. Siempre doy lo mejor de mi (I always give my best)	4.11	4.00	0.850	−1.032	1.425	0.585
V11. Puedo alcanzar los objetivos que me propongo incluso cuando hay obstáculos (I can achieve the goals I set for myself even when there are obstacles)	4.08	4.00	0.745	−0.528	0.269	0.594
V12. Cuando las cosas parecen desesperadas, no me rindo (When things seem desperate, I do not give up)	4.00	4.00	0.875	−0.827	0.770	0.594
V13. Sé a quién acudir para buscar ayuda (I know who to turn to for help)	3.91	4.00	0.989	−0.810	0.179	0.476
V14. Bajo presión, me centro y pienso con claridad (Under pressure, I focus and think clearly)	3.43	4.00	1.170	−0.390	−0.677	0.456
V15. Prefiero tomar el mando en la solución de problemas (I prefer to take the lead in solving problems)	3.81	4.00	0.906	−0.487	−0.083	0.531
V16. No me desanimo fácilmente por los fallos (I am not easily discouraged by failures)	3.41	4.00	1.006	−0.286	−0.500	0.559
V17. Pienso en mí mismo/a como una persona fuerte (I think of myself as a strong person)	3.83	4.00	0.973	−0.747	0.296	0.605
V18. Tomo decisiones impopulares o difíciles (I make unpopular or difficult decisions)	3.49	4.00	0.923	−0.253	−0.306	0.410
V19. Puedo manejar sentimientos desagradables (I can handle unpleasant feelings)	3.50	4.00	0.929	−0.416	−0.052	0.526
V20. Suelo actuar por corazonadas, impulsos o presentimientos (I usually act by hunches, impulses or hunches)	3.13	3.00	1.131	−0.042	−0.817	0.280
V21. Las cosas que hago tienen un sentido (The things I do have a sense)	4.18	4.00	0.736	−0.911	1.622	0.540
V22. Tengo el control de mi vida (I have control of my life)	3.89	4.00	0.928	−0.814	0.479	0.544
V23. Me gustan los retos (I like challenges)	4.14	4.00	0.840	−0.651	−0.227	0.570
V24. Trabajo para conseguir mis objetivos sin importarme las dificultades (I work to achieve my goals without caring about the difficulties)	4.21	4.00	0.756	−0.791	0.607	0.689
V25. Estoy orgulloso/a de mis logros (I am proud of my achievements)	4.58	5.00	0.739	−2.235	6.126	0.514

Note: M = Means; Md = Median; SD = Standard Deviation; cHI = Corrected homogeneity index.

In view of these results, we proceeded to perform EFA with the rest of the items, regardless of items 5 and 25.

The rotation revealed that item 6 did not load on any factor, as it did not reach the value of .300, so it was eliminated from the scale, as were items 7 and 20, which appeared in the two factors with a smaller difference of .100.

These results yielded a scale made up of 20 variables distributed in two factors, F1 Personalidad Resistente (Tough Personality) (PerRes), and F2 Recursos y Control (Resources and Control) (RecCon). A further rotation was carried out and the EFA results explained 48% of the total variance of the two factors. The Goodness of Fit Index (GFI) obtained a value of .98, and the root mean square residual (RMSR) obtained a value of .058, showing a good fit to the bidimensional structure of the scale [47]. Both Bartlett's statistic (= 3589.1, df = 190, $p = 0.000010$) and the Kaiser–Meyer–Olkin (KMO) test (= 0.91) indicated a good fit to the data, and a variance percentage of .49 (see Table 2).

Table 2. Rotated matrix loadings.

	F1 PerRes	**F2 RecCon**
V. 16	0.857	
V. 15	0.844	
V. 17	0.762	
V. 18	0.755	
V. 19	0.685	
V. 14	0.647	
V. 8	0.588	
V. 4	0.569	
V. 11	0.524	
V. 23	0.524	
V.12	0.505	
V. 1	0.424	
V. 10		0.749
V. 22		0.735
V. 24		0.603
V. 2		0.601
V. 9		0.594
V. 21		0.533
V. 13		0.518
V. 3		0.491
Cronbach's Alpha	0.873	0.779

The MPlus.7 program was used to verify and corroborate the EFA results. The estimator has been MLM. The values of the comparative fit index (CFI) and the Tucker-Lewis index (TLI) were both lower than .90, but the root means square error of approximation (RMSEA) reached .056, and the standardized root mean square residual (SRMR) obtained a value of .050. As the IFC and TLI did not reach adequate values, the model had to be readjusted. This readjustment has shown that variable 9 loads on variable 3, and variables 4, 11, and 24 load on variable 2 (see Table 3 and Figure 1).

Table 3. Values of fit indexes in the confirmatory factor analyses.

	$\chi 2$	***p***	**RMSEA**	**CFI**	**TLI**	**SRMR**
Fit indexes value of the original model	2247.277	0.00	0.60	0.892	0.877	0.05
Re-specified model	2247.277	0.00	0.05	0.917	0.904	0.05

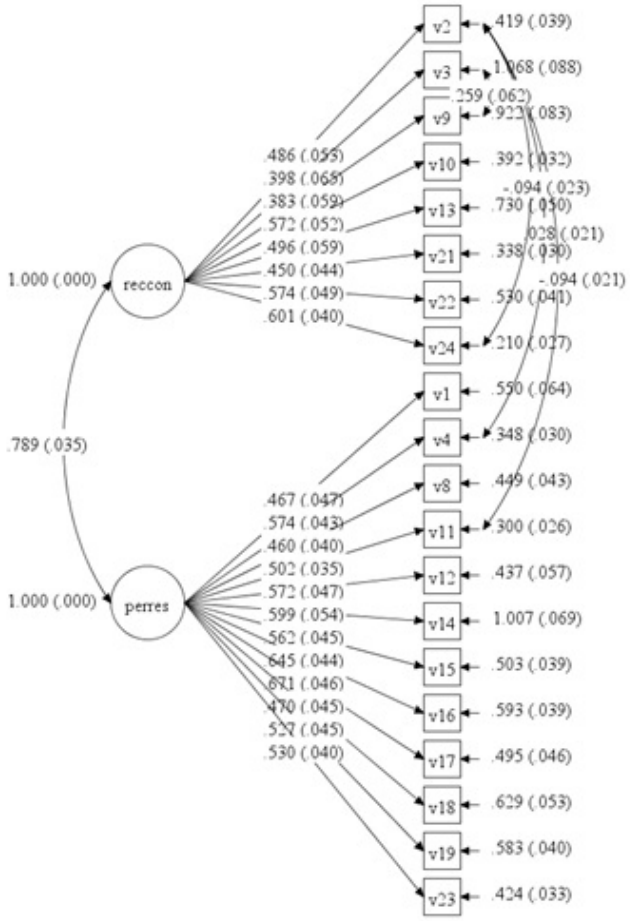

Figure 1. Estimated parameters for the model of the CD-RISC.

3.2. Empirical Research

First, we examined whether sex may inference the resulting factors. For this purpose, we used Levene's test to verify variance equality and subsequently Student's t-test for independent samples, and finally, Cohen's d to determine the effect size. Levene's test (with values higher than 0.05) showed that the groups were homogeneous. Student's *t*-test revealed statistically significant sex differences in the RecCon factor ($t_{(2, 371)} = -2.997$, $p \leq 0.01$, $DM = 0.202$, $d = 0.37$), with women scoring higher, and with a medium effect size (see Table 4).

Table 4. Differences in arithmetic means among factors according to sex.

Factors	Levene's test		Student´s t					
	F	*p*	*t*	*df*	*p*	Sex	DM	Cohen's *d*
RecCon	1.853	0.174	−2.997	2371	0.003	Man/Woman	−0.202	0.37
PerRes	1.248	0.265	1.348	2371	0.178	Man/Woman	0.095	0.16

An Analysis of de Variance (ANOVA) was performed to determine possible statistically significant differences in the resulting means. After verifying these differences, first, Levene´s test was applied to the future teachers' specialty, confirming the equal variance in the two factors ($p \geq 0.05$), and subsequently, a post hoc Bonferroni contrast was carried out. The RecCon factor results showed statically significant differences between the PE students and the ChE students, with higher scores in the ChE group, with a medium effect size ($F_{(2, 370)} = 5.140$, $p \leq 0.01$, DM = 0.23, $d = 0.41$) (see Table 5).

Table 5. Differences of means according to the future teachers' specialty.

Factors	Levene		ANOVA			Post Hoc Contrast			Cohen's *d*
	F	*p*	*F*	*df*	*p*	Specialt.	DM	p	
ResCon	1.699	0.184	5.140	2370	0.006	PE-ChE	−0.23	0.004	0.41
						PE-SE	−0.06	1.000	0.01
						ChE-SE	−0.17	0.122	0.39
PerRes	0.107	0.898	1.607	2370	0.202	PE-ChE	−0.02	1.000	0.04
						PE-SE	−0.13	0.233	0.23
						ChE-SE	−0.10	0.636	0.20

With regard to the inference of age after dividing the sample into three groups, participants between 21 and 24 years old scored significantly higher in the two factors. Levene´s test yielded values of $p \geq 0.05$, so that equal variances were assumed and therefore the Bonferroni Post Hoc Contrast test was applied.

The results showed statically significant differences in PerRes between participants under 21 years of age and those between 21 and 24 years ($F_{(2, 370)} = 5.545$, $p \leq 0.01$, DM = 0.23, $d = 0.41$) and between those under 21 and those over 24 ($F_{(2, 370)} = 5.545$, $p \leq 0.05$, DM = 0.22, $d = 0.35$). In the RecCon factor, no statistically significant differences were observed (see Table 6).

Table 6. Means differences according to age.

Factors	Levene		ANOVA			Post Hoc Contrast			Cohen's *d*
	F	*p*	*F*	*df*	*p*	Age (years)	DM	*p*	
ResCon	1.218	0.297	0.725	2, 370	0.180	−21/21−24	−0.13	0.208	0.23
						−21/+24	−0.05	1.000	0.09
						21−24/+24	0.07	0.881	0.16
PerRes	2.453	0.087	5.545	2, 370	0.004	−21/21−24	−0.23	0.006	0.41
						−21/+24	−0.22	0.023	0.35
						21−24/+24	0.01	1.000	0.02

The inference of the future teachers' university was verified. Levene´s test yielded a value of $p \geq 0.05$, indicating equal variances. There were statistically significant differences the between the USE students and the UNE students only in RecCon, with higher scores in this factor in the USE students ($F_{(2, 370)} = 5.466$, $p \leq 0.01$, DM = 0.21, $d = 0.38$) and a medium the effect size ($d = 0.45$) between UNE and UCH. UCH students also scored higher than UNE students in PerRes, with a medium effect size ($d = 0.60$) and a medium the effect size ($d = 0.37$) between USE and UCH (see Table 7).

Table 7. Medium differences according to origin university.

Factors	Levene		ANOVA			Contrastes Post Hoc			Cohen's *d*
	F	*p*	*F*	*df*	*p*	University	DM	*p*	
ResCon	1.598	0.204	5.466	2, 370	0.005	USE/UNE	0.21	0.006	0.38
						USE/UCH	−0.09	1.000	0.18
						UNE/UCH	−0.30	0.144	0.45
PerRes	0.310	0.733	3.881	2, 370	0.023	USE/UNE	0.15	0.089	0.26
						USE/UCH	−0.21	0.491	0.37
						UNE/UCH	−0.36	0.068	0.60

4. Discussion

The aim of this study was to confirm the factorial structure of CD-RISC for reliable application teachers in training for ChE, PE, and SE. The validation process was performed through EFA and CFA, yielding a two-factor distribution, Resources and Control and Tough Personality (ResCon and PerRes). This result differs from that proposed by the scale's authors [8], which obtained the following five factors: personal competence, confidence and intuition, positive acceptance of change and secure relationships, control, and spirituality.

The Tough Personality factor is associated with the Personal Competence and Confidence and Intuition factors, whereas the Resources and Control factor is associated with the Positive Acceptance

of Change and Secure Relationships, and Control factors. The items corresponding to the fifth factor (spirituality) were not used. This result does not differ very much from other works that have modified the number of items and/or factors, after the adaptation and validation of the scale, adjusting it to different contexts [35–38].

After validating the scale, we tried to determine possible differences due to sex, age, study specialty, and home university. Regarding sex, women seem to be more resilient than men. These results were corroborated by Moreno and Sáiz study [48], which indicate that the differences by sex may be due to the presence of a higher level of empathy in women, but they contradict the findings of other authors concluding that men had higher levels of resilience than women. In this regard, see Allan, McKenna, and Dominey [23] and Erdogan, Ozdogan, and Erdogan in the case of university students [25], Ramírez and Castro with adolescents [24], and Cachón, Cuervo, Zagalaz, and González, who studied self-concept in teachers in training [29].

Forján and Morelatto analyzed the levels of resilience in teachers, finding that PE teachers scored higher than ChE teachers [9]. However, in our results, future ChE teachers obtained higher scores than PE teachers. This may be due to the fact that PE students do not have a profile of teaching as defined as those of ChE and SE, since being still in the beginning of the degree they still do not know their future specialization.

Furthermore, our results have shown that the level of resilience increases with age, corroborating the results obtained by Suárez-Bagnasco, indicating that older people have higher resilience scores than younger ones when comparing people between 30 and 60 years old [49].

It was confirmed that USE students had a more resources and control, and the difference with the UNE students was statistically significant. Results of the earlier studies have shown that USE student´s show more academic engagement, also pointing out that women have higher scores in commitment to teaching studies than men [50]. It would be interesting to check whether the level of resilience of teachers in training could somehow predict their commitment to the studies.

Regarding the limitations of this study, the small size of the sample, its non-random nature, and the low participation of universities should be noted. In relation to future lines of research, it is necessary to replicate a study in a larger population using data on the commitment to the studies, seeing if the levels of resilience can predict it, and, based on these data, thus prepare the implementation of programs that improve resilience in both future teachers and active teachers.

5. Conclusions

In conclusion, psychological resilience is the ability to cope with a crisis or to return to pre-crisis status quickly, to remain calm during a crisis and to move on from the incident without long-term negative consequences. It can be symbolised by the phoenix arising from its own ashes, which is equivalent to a human being's ability to overcome difficulties and renew his or her strength and, hence its importance as a technique in teacher training. The instrumental research yielded a two-factor distribution of the CD-RISC. The empirical research revealed that women and older individuals had higher level of resilience than men, younger individuals, and future ChE teachers. Teachers with low levels of resilience can show difficulties in being empathic with schoolchildren. It was necessary to know these levels of resilience in the case of students participating in the study since being still in the beginning of their degree it is possible to implement intervention programs that improve these levels.

Author Contributions: conceptualization, J.C.Z., M.B.S.P.V., M.L.Z.S., I.L.M. and C.G.G.M.; methodology, J.C.Z., M.B.S.P.V., M.L.Z.S., I.L.M., and C.G.G.M.; validation, M.B.S.P.V and C.G.G.M.; formal analysis, C.G.G.M. and M.B.S.P.V.; investigation, J.C.Z., M.B.S.P.V., M.L.Z.S., I.L.M., and C.G.G.M.; data curation, J.C.Z., I.L.M., and M.B.S.P.V.; writing—original draft preparation, I.L.M., J.C.Z., and M.L.Z.S.; writing—review and editing, C.G.G.M. and M.B.S.P.V. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: The authors want to thank the PhD program in Teaching Innovation and Teacher Training of the University of Jaén (Spain), which makes possible joint research between universities. To HUM653 Research

Groups, Didactic Innovation in Physical Activity (IDAF) of PAIDI and UJA and Education, Physical Activity, Sports and Health (EDAFIDES) and Grupo Tecn@ of UNIOVI, which have supported this work.

Conflicts of Interest: The authors declare no conflict of interest.

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