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Review article

Validation of the Child and Youth Resilience Measure-28 (CYRM-28) among Spanish youth

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ABSTRACT

Objectives: This article presents a validation study of the 28-item Child and Youth Resilience Measure (CYRM-28). The sample contained 365 Spanish youth ages between 15 to 21, from Navarre (Spain), all of them enrolled in Initial Vocational Qualification Programs.
Method: The CYRM-28 was administered to students from 27 secondary schools in the province of Navarre. Confirmatory analyses were conducted.
Results: The structure of the original scale was confirmed, as well as acceptable psychometric properties.
Discussion: Findings add support to the CYRM-28 as a reliable and valid self-report instrument that measures three components of resilience processes in the lives of youth with complex needs. The CYRM-28 shows adequate psychometric properties, the CFA presents indices of goodness and fit (Chi-squared = 60,170, df = 17, $p < .001$; CFI = .960, TLI = .934, IFI = .961, RFI = .911 and NFI = .946; RMSEA = .084).
Conclusion: Advanced statistical modeling yielded evidence that the scale, originally developed for use in several countries, can be used to assess resilience in Spanish youth.

1. Introduction

Resilience is one of the most studied variables in recent years (Masten and Barnes, 2018; Lerner et al., 2019; Thomas and Zolkoski, 2020). References to resilience are increasingly present in conversations in a variety of settings. Moreover, in recent months, due to the COVID-19 pandemic, there has been an exponential increase in the number of searches, studies and publications that analyze the relationship between stress, coping strategies, and their involvement in developing resilience (de la Fuente et al., 2017; Polizzi et al., 2020). This ability to address adversity positively is clearly important to human development. In fact, according to Joubert (2009), encouraging the development of resilience is fundamental to promoting mental health in the population given that it enhances one's ability to manage external pressures and daily stressors (World Health Organization, 2016). Internal qualities such as self-control (Zamarro et al., 2020; Warren and Hale, 2020), goal setting, sense of humor, introspection, and creativity as well as external qualities such as having relational ties (Werner, 2000; Hadfield and Ungar, 2018) allow people and groups to withstand and recover from difficult or adverse situations.

We briefly present the definition and evolution of the concept of resilience, a description of the measurement of this capacity in adolescence, and specifically, an exploration of the CYRM scale and its validity. We then present the study's objectives, method, results, and conclusions.

1.1. Definition and evolution of the resilience construct

The concept of resilience, its origin, its development over four generations of research, the factors involved, and ways to intervene have all been described and analyzed in the last few years (Polizzi et al., 2020; Prince-Embury and Saklofske, 2013). However, assessment or measurement of this ability in adolescents is not fully established (Alayarian, 2018; Wang et al., 2015; Mohammadinia et al., 2019; Zimmerman and Brenner, 2010). Tools are available to assess resilience capacity, but most of them are developed for the adult population. Positive or adequate coping in the face of daily difficulties is important for everyone, but even

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more so for youths and adolescents today (Alayarian, 2018; Cameron et al., 2017; Masten and Motti-Stefanidi, 2020). In this regard, rigor in the use of valid, reliable instruments is a primary criterion for understanding any study variable, its characteristics, and people's needs to ensure adequate intervention (De la Fuente et al., 2012a; de la Fuente et al., 2012b). In the case of resilience, the ultimate purpose is to help individuals face adversity.

The concept of resilience is understood as the ability to face difficult situations in life and emerge from them stronger (Luthar et al., 2000; Masten and Barnes, 2018). However, it has not always been defined in the same manner; in fact, researchers have transformed and enriched the definition over four generations of research (Luthar et al., 2006; Thomas and Zolkoski, 2020; Prince-Embury and Saklofske, 2013; O'Dougherty et al., 2013), and inconsistencies in its conceptualization persist (Turner et al., 2017). According to Southwick et al. (2014), when defining resilience, it is important to specify whether it is conceived as a dispositional trait (Connor and Davidson, 2003), a quality or skill that is acquired in social interaction, one that is promoted and developed through intervention programs (Rutter, 2013; Wagnild, 2009; Romero and Saavedra, 2016), or an outcome (Lepore and Kliewer, 2019).

We point to two definitions of resilience as examples: "the universal ability enabling a person, group or community to prevent, minimize or overcome the harmful effects of adversity" (Ungar and Theron, 2020, p. 445) and "a quality that all human beings possess, resulting from a dynamic interaction process between the individual and the society or environment, enabling him or her not only to face adversity but to emerge from it stronger" (Artuch, 2014, p. 102).

In the pilot phase of one study that was conducted in 11 countries on five continents, a number of factors were identified that contributed to the development of resilience in youth (The Learning Partnership, 2009). *Individual factors* were assertiveness, problem-solving ability, self-awareness, empathy, sense of humor, and having goals and aspirations (Evans et al., 2016). *Relational factors* were positive models to follow, perceived social support, emotional expression, adequate parental care in the family (Theiss, 2018; Van Rensburg et al., 2018; Mestre et al., 2017), and acceptance from one's peer group. *Community contexts* were avoidance of exposure to violence in the family, in the community, and among peers (Saavedra and Villalta, 2008), government provision for children's safety, recreation, housing, and jobs when they are older, and access to schooling and education, information, learning resources, protection, and security. *Cultural factors* were tolerance of different ideologies and beliefs (Meindl et al., 2019), having a philosophy of life (Benard, 1991), cultural and/or spiritual identification, and connection to the cultural roots of one's land.

Michel Ungar and Linda Liebenberg created the *Resilience Research Centre* (RRC) in Canada, which coordinates the *International Resilience Project* (IRP). Resilience is understood as a dynamic process in which the environment and individual influences interact in a reciprocal and ecological relationship that allows the person to adapt despite adversity. As Ungar (2012) explains, "in the context of exposure to significant adversity, whether psychological, environmental, or both, resilience is both the capacity of individuals to navigate their way to health-sustaining resources … and a condition of the individual's family, community and culture to provide these health resources and experiences in culturally meaningful ways" (p. 225). This approach has now been recognized as the "fourth wave" of resilience research, which examines the interactions between factors that range from neurobiology and the genome to the community or contextual level (Masten, 2007, p. 924), where a "healthy brain" is related to a "resilient" brain (Brendtro and Mammen, 2017).

Resilience is considered one of the most fundamental non-cognitive or "soft" skills for young people (Danner et al., 2019; González-Torres and Artuch, 2014; Burgund Isakov and Hrncic, 2020; Obilor and Onyeaghala, 2020; Warren and Hale, 2020; Zhou, 2016) because it corresponds to skills or patterns of thought, feelings, and behaviors (Duckworth and Yeager, 2015) that are socially determined and can develop throughout life. Such coping skills are key for adolescents' and young people's rapid adaptation to the changes required for "survival" (Reig, 2015; Abrahams et al., 2019). However, despite the importance given to resilience today, difficulties and a lack of consistency remain in its measurement, due in part to the definition problems mentioned above.

1.2. Resilience measures in youth and adolescents

As noted above, valid tools that allow for rigorous review of resilience processes are not yet well developed (Masten, 2018; Windle et al., 2011b). Therefore, despite the efforts made in recent decades to understand the construct of resilience thoroughly and create new scales (Lock et al., 2019; Villasana et al., 2017), we still lack valid, reliable measures that meet the psychometric requirements (Clark and Watson, 2019) and that are suited to youth, taking into account their various cultures and contexts. In 2011, Windle et al. (2011) published a review of the best scales for assessing resilience capacity. These authors highlighted 15 instruments to meet the criteria of validity, internal consistency, predictive validity, and construct validity adequately. Among the scales are the CD-RISC (Connor and Davidson, 2010) scale, widely used with adults, and the CYRM (Ungar and Liebenberg, 2009) scale, used with young people and adolescents. In addition, the authors noted other scales that assessed resilience in the adolescent population: *Youth Resiliency: Assessing Developmental Strengths* (YR: ADS) (Donnon and Hammond, 2007), *The Resiliency Attitudes and Skills Profile* (Hurtes and Allen, 2001), *The Resilience Scale* (Wagnild and Young, 1993), *The Resilience Scale for Adolescents* (Hjemdal, Friborg et al., 2006), *Ego Resiliency* (Klohnen, 1996), and the *Child and Youth Resilience Measure* (Ungar and Liebenberg, 2009). The CYRM scale for adolescents (Ungar et al., 2013) has been noted for presenting good content validity and construct validity and may be the best option for cross-national studies. In recent years, as we will show below, studies have used the CYRM to measure resilience in young Chinese, Iranian, African, Canadian, and Spanish people, among others.

Given the need for instruments that have adequate reliability and validity, it is important that research studies replicate their structure. Reproducibility is an essential part of the scientific method. Yet less than half of the published replications produce the same results as those of the original studies (Anderson et al., 2015).

1.3. The CYRM-28 scale

In 2002, Michael Ungar, from Dalhousie University, Halifax, Canada, founded the International Resilience Project (IRP) with the aim of bringing together researchers interested in resilience from a different approach that took into account the immediate (the community to which the subject belongs) and distal (culture) social contexts (Ungar et al., 2013, p. 13). As Ungar (2019) stated, global, cultural, and contextual aspects as well as specific aspects of young people's lives contribute to the development of resilience.

The members of the IRP established that the development of resilience takes place through the influence of four fundamental aspects: individual traits, relationship factors, community/context, and cultural factors (IRP, 2006, p. 5; see Table 1). For these authors, the cultural factor refers to customs, traditions, languages, and social interactions that provide a sense of identity for individuals and groups. The community/context factor is different from culture and is understood as the social, temporal, and geographic location in which culture is manifested.

From 2003 to 2005, team members from around the world worked within this conceptual framework to develop a quantitative measure to investigate the aforementioned aspects of resilience in young people, and these efforts took shape in the creation of the *Child and Youth Resilience Measure* (CYRM) (Ungar and Liebenberg, 2009). This scale is a quantitative instrument that is noted as the first cross-cultural scale developed to assess resilience in children and youth. It is a screening tool to test for resources (individual, relational, cultural, and community) that are present in young people between the ages of 9 and 23 and that help them face adversity, thereby reinforcing resilience (Ungar and Liebenberg,

Table 1. Core aspects in the development of resilience.

A. Individual traits that include:	B. Relationship factors such as:
• Assertiveness • Ability to solve problems • Self-efficacy • Being able to live with uncertainty • Self-awareness • Perceived social support • Positive outlook • Empathy for others • Having goals and aspirations • Showing a balance between independence and dependence on others • Appropriate use of, or abstinence from, substances like alcohol and drugs • Sense of humor • Sense of duty (to others or self, depending on the culture)	• Parenting that meets the child's needs • Appropriate emotional expression and parental monitoring within the family • Social competence • Presence of positive mentors and role models • Meaningful relationships with others at school and home • Perceived social support • Peer group acceptance
C. Community contexts that provide:	**D. Cultural factors such as:**
• Opportunities for age-appropriate work • Avoidance of exposure to violence in one's family, community, and among peers • Government provision for children's safety, recreation, housing, and jobs when older • Meaningful rights of passage with appropriate amounts of risk • Tolerance of high-risk and problem behavior • Safety and security • Perceived social equity • Access to school and education, information, and learning resources	• Affiliation with a religious organization • Tolerance of differing ideologies and beliefs • Adequate management of cultural dislocation and changes or shifts in values • Self-betterment • Having a life philosophy • Cultural and/or spiritual identification • Being culturally grounded by knowing where you come from and being part of a cultural tradition that is expressed through daily activities.

Source: International Resilience Project (2006) p.5.

2009, 2011; Wood et al., 2020). The scale is well regarded and has been applied in 14 countries with good reliability and validity (Sanders et al., 2017a, 2017b). It has recently been used to assess resilience capacity in young people with chronic diseases, where it also showed good properties of construct validity compared to other scales that also measure resilience (Cambric, 2019).

The initial development of the CYRM scale was based on the ecological model of development by Bronfenbrenner (1987) and Bronfenbrenner and Ceci (1994), which conceives of the individual as an open system influenced by modifications from the surrounding systems (family, society, school, work, etc.). Resilience is understood as a "multidimensional process that mediates the effects of stressors and favors the achievement of positive outcomes" (Liebenberg et al., 2012, p. 291). As we have indicated, this perspective places special emphasis on the external protective factors of children and youth that come from family and social relationships, culture, and context/community (Goldstein and Brooks, 2013). Therefore, support for people who need help (youths and people at risk) and guidance from those groups that are expected to provide it (communities, families, and peer groups) are fundamental.

The first version of the CYRM contained 58 items, but it was later reduced to 28 items, verifying that acceptable validity and reliability criteria were maintained as well as internal consistency of 0.82 (Ungar and Liebenberg, 2009). The present study included this second version. Five Likert-type response options are offered, ranging from "not at all" to "a lot." The total score ranges from 28 to 140, with higher scores representing greater resilience. Taking into account the core aspects of developing resilience, the authors divided the scale into 3 factors: individual, relational and contextual (community and culture). Each of these factors contains several subfactors. The individual factor includes personal skills, peer support, and social skills; the relational factor with primary caregivers includes physical care and psychological care received; and the contextual factor includes spiritual, educational, and cultural. Even though the authors established a 3-factor structure, in some studies, researchers used 4 factors by separating culture from context (Sanders et al., 2017a,b); this method concurs with the components for development of resilience Table 1 presents. In 2013, the authors presented a new, reduced version containing 12 items, known as the CYRM-12: *A brief measure of resilience* (Liebenberg et al., 2013).

The IRP currently offers several measurement instruments according to age, from 5 to 23 years (see Table 2).

1.4. Validation studies of the CYRM scale

Many studies from various contexts have included the CYRM (Cyrus, 2020; Daigneault et al., 2013; Katsumata and Mohanan, 2020; Liebenberg et al., 2012; Munford and Sanders, 2016; Sanders et al., 2017a,b; Shaikh and Rubab, 2020; Ungar et al., 2019; Theofani and Herdiana, 2020); however, very few researchers have conducted validation studies in non-English-speaking contexts (Daigneault et al., 2013; Xiang et al., 2014).

From 2012 to 2019, researchers from various countries and cultures (Canada, China, Iran, South Africa, New Zealand, Australia, and Spain) published validation studies. Of those studies, many were limited to exploratory factor analyses (Daigneault et al., 2013), and others contributed confirmatory analyses (Govender et al., 2017; Kazerooni et al., 2017; Liebenberg et al., 2012; Sanders et al., 2017a,b), but the 3-factor structure the authors proposed was confirmed in only a few cases.

Three studies conducted with youth from Canada (Liebenberg et al., 2012), New Zealand (Sanders et al., 2017a,b), and Iran (Kazerooni et al., 2017) confirmed the original scale's three-factor structure. However, even though the study on Iranian youth confirmed this structure, the scale version was reduced to 11 items.

Michel, Mu, and Hu (2016) conducted a study to validate the simplified CYRM-12 scale for a Chinese population. The authors obtained favorable results and replicated the original model; however, they suggested the need for more studies to generalize this model to other populations.

Table 2. Resilience measurement scales offered by the IRP.

Measure	Recommended age of target individual	Completed by	Scoring system	Language
CYRM-R	5–9	Child: Self-report	3/5-point	Standard
CYRM-R	10–23	Youth: Self-report	3/5-point	Standard/ simplified
ARM-R	18+	Adult: Self-report	3/5-point	Standard/ simplified
PMK-CYRM-R	5–9	Person Most Knowledgeable	3/5-point	Standard
PMK-CYRM-R	10–23	Person Most Knowledgeable	3/5-point	Standard/ simplified
PMK-ARM-R	18+	Person Most Knowledgeable	3/5-point	Standard/ simplified

Source: IRP (2006) https://cyrm.resilienceresearch.org/.

In other validation studies, such as the one conducted on South African adolescents (Govender et al., 2017), favorable results were also obtained in relation to a 3-factor structure. In this study, however, the factor structure showed a better fit when the scale was reduced from 28 to 24 items (eliminating items 1-*I have people I admire*, 3-*getting an education is important to me*, 5-my *parents or guardians take good care of me,* and 28-*I am proud to be (nationality)*).

A Spanish adaptation of the scale was recently published but did not replicate the 28-item scale's original structure. In this study, Llistosella et al. (2019) proposed a reformulation of the scale that contains 32 items and maintains the 3-factor structure. They eliminated four items from the original scale (2-*I cooperate with people around me*, 5-my *parents or guardian take good care of me*, 10-*I am proud of my ethnic origin,* and 28-*I am proud of being (nationality)*). They reformulated five items because they presented very low saturation and added six others. The researchers presented an analysis of the scale's convergent and discriminant validity and examined its relationship with two other scales, the *Brief Resilient Coping Scale* (Sinclair and Wallston, 2004) and the *Coping Scale for Adolescents and Self-Concept* (Frydenberg and Lewis, 1996).

As we have pointed out, other researchers have not replicated the original structure but found a different factor structure. This was the case in the study by Daigmeault et al. (2013) on French-Canadian youth and the validation study Langham et al. (2018) on indigenous Australian students.

Table 3 offers a summary of the results of CYRM validation studies in multiple countries.

In summary, we can see that researchers have conducted several international studies to replicate the CYRM scale's structure, but some did not manage to maintain either the 28 items or the 3-factor structure its authors proposed. We observed that the CYRM scale's proposed 3-factor structure (individual, relational, and broader context) is the one that best reflects the theoretical models of resilience, as Garmezy (1983), Luthar et al. (2000), Masten (2018), Rutter (2012), and Werner (2000) showed.

1.5. Objectives and hypotheses

The aim of the present study is to present a validation of the CYRM-28 (Ungar and Liebenberg, 2009) adapted to Spanish youth to offer an assessment instrument that helps reveal young people's strengths and weaknesses and, with this knowledge, help them better face the adversities of daily life.

Specifically, we determined whether the translation and adaptation of the Child and Youth Resilience Measure (CYRM-28), applied to a pilot sample of Spanish youth, presents good psychometric properties and replicates the original 3-factor structure of the CYRM with 28 items.

We posed the follow hypotheses:

H1. Reliability of the total scale and of its three factors (Cronbach) will be similar to those of the original values (Liebenberg et al., 2012).

Table 3. CYRM validation studies in different countries.

Models	Chi-squared $\chi 2$	df	RMSEA	CFI	AIC
Canadian Model (Liebenberg et al., 2012)	600.229	339	.057	.775	790.229
Aotearoa New Zealand Model (Sanders et al., 2017a,b)	553.931	344	.051	.811	733.931
Iranian Model (Kazerooni et al., 2017)	140.475	352	.083	.886	-
South African Model (Govender et al., 2017)	2557.60	347	.059	.832	2675.60
Indigenous Australian Model (Langham et al., 2018)	133.4	88	.047	.922	-
South African Model (van Rensburg et al., 2019)	602.784	345	.056	.778	780.784

Source: prepared by the authors.

H2. In the sample of Spanish youth, the model with a 3-factor structure will be confirmed, as established by the authors of the original scale and by other authors (Daigenault et al., 2013; Liebenberg et al., 2012).

2. Method

2.1. Sample and data collection

The sample included 365 students from 27 schools that offer *Initial Vocational Qualification Programs* (IVQPs) in Navarre (Spain). These educational programs are for youths between the ages of 15 and 21 who have personal and academic difficulties and are considered potentially at risk for social exclusion. These programs are part of one of the Formative Actions of the Spanish Ministry of Education within the framework of non-regulated education, having the dual purpose of reintegration into the educational system and reinsertion into the labor system.

Of the 365 students in the sample, 71.2% were boys and 28.8% were girls, and the age distribution was as follows: 15 years old (19.7%), 16–17 (69.9%), 18–19 (8.5%), and 20–21 (1.9%). Of the 365 students, 61.1% were enrolled in public schools, 20.5% in schools run by non-profit agencies, and 18.4% in partially subsidized private schools. The schools were spread geographically throughout Navarre (Spain). There were two IVQP modalities: 55.3% of students were enrolled in the vocational workshop and 44.7% in the basic program. We considered the sample highly representative because we obtained participation from nearly 85% of the total youth population enrolled in IVQPs during the 2011/2012 school year.

2.2. Instrument

The scale to be validated in this study with a Spanish population was the 28-item CYRM scale with three factors: *individual*, *relational*, and *contextual*. In the 28 items, young people must indicate to what extent they identify with statements such as "My parents take good care of me," "I am able to solve problems without hurting myself or other people," and "In my environment, I know where to go to get help." Completion of the instrument takes about 5–10 min. Higher scores indicate greater capacity for resilience. We describe each of the factors below:

Factors CYRM
Factor 1: Individual - Personal skills: includes items related to cooperation and interaction with other people, avoiding violence, and aspects related to inner strengths that enable the achievement of objectives and goals. - Peer support: feeling supported by friends or being able to count on them in difficult situations. - Social skills: having opportunities to demonstrate how to carry on in circumstances of life, how to react in difficult situations and, if needed, knowing where to go to get help.
Factor 2: Relationship with primary caregivers - Physical care received: issues related to protection from parents or guardians, basic needs being met through the family (such as having enough food). - Psychological care: parents or guardians knowing about one's life, communicating emotions with parents or guardians about how I feel, sense of security in the family, accepting and having fun with family traditions.
Factor 3: Context - Spiritual: having spiritual beliefs as a source of personal strength, participation in religious organizations, importance given to contributing to the community. - Education: beliefs about the importance of obtaining an education and feeling welcomed at school. - Cultural: having people you admire, being proud of your own ethnicity, being treated appropriately in the community, having fun with community traditions, being proud to feel you are from a certain place, etc.

2.3. Procedure

This study included three main phases: 1) translation of the scale into Spanish, 2) conducting a pilot study, and 3) contacting all Navarran schools and institutions that offer *Initial Professional Qualification Programs,* followed by application of the scale to 365 students and confirmatory factor analysis (CFA).

For the first of these steps, we considered that content validity is established in various situations, including the common situations of "(a) the design of a test, and (b) the validation of an instrument that was constructed for a different population, but that was adapted through a translation procedure (semantic equivalence)" (Escobar-Pérez and Cuervo-Martínez, 2008, p. 27). We applied the expert judgment technique, using the individual aggregate method. Therefore, we translated the scale, asked each expert individually to make a direct evaluation of the instrument items, and observed how well the translated items corresponded to the original items and to the construct.

We undertook the following process. First, we obtained authorization from the authors of the original scale to carry out the translation (currently, they have a validated version in Spanish for the Latino population). Second, we translated the scale into Spanish with the collaboration of two experts who worked independently. We compared the two versions and established a version that an expert supported. A person whose mother tongue is English then translated this version into English. This translation was compared to the initial English version and found to be substantially consistent. Finally, two experts in the field of resilience verified that the scale translated into Spanish mediates the resilience construct.

Male and female students from one school in Pamplona (Navarre, Spain) participated in the pilot study and completed the CYRM. We found the translation adequate, as the participants had practically no problem understanding the items, and the time of application matched what the scale manual stipulated.

Later, we administered the scale to the 365 students between the ages 15 and 21 who were enrolled in IVQPs. Finally, we collected and analyzed the data.

This work meets all the Ethics Committee requirements, parameters, and standards for psychological and educational research with human subjects in regard to voluntary participation as well as anonymity and protection of students' privacy, as provided by the rules of the APA, the Psychology Code of Ethics, and the Spanish Data Protection Law.

2.4. Data analysis

Confirmatory Factor Analysis. Based on the favorable results obtained in the exploratory analysis, we decided to move forward and conduct a confirmatory analysis. To check H2, we analyzed the internal structure of the scale in this sample, just as researchers did in other investigations that aimed to validate the scale in various countries. Using the AMOS program, we performed a CFA to test the original scale's three-factor model (individual characteristics, relationship with primary caregivers, and contextual components that facilitate a sense of belonging) (see Figure 1).

All fit measures of the incremental model were above the suggested limit of 0.90 (Bentler, 1990): the Comparative Fit Index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), Relative Fit Index (RFI), and Tucker-Lewis Index (TLI) (Hu and Bentler, 2009; Marsh et al., 2004).

The value of the Parsimonious Comparative Fit Index (PCFI) was .58, which is also satisfactory. We replicated the original scale's results. The value of the root mean square error of approximation (RMSEA) was 0.084, less than the warning value of 0.09 (Ho, 2006). Values between 0.05 and 0.08 are considered acceptable (Hu and Bentler, 2009).

We analyzed the data using IBM Statistical Product and Service Solutions (SPSS) v 22 and AMOS v 22 for Windows.

3. Results

3.1. Reliability

Cronbach alpha coefficients indicated that the scale's internal consistency is good for the CYRM-28 scale as a whole (α = .889) and for each of its 3 factors, individual factor (α = .81), relational factor (α = .792), and contextual factor (α = .700) (see Table 4).

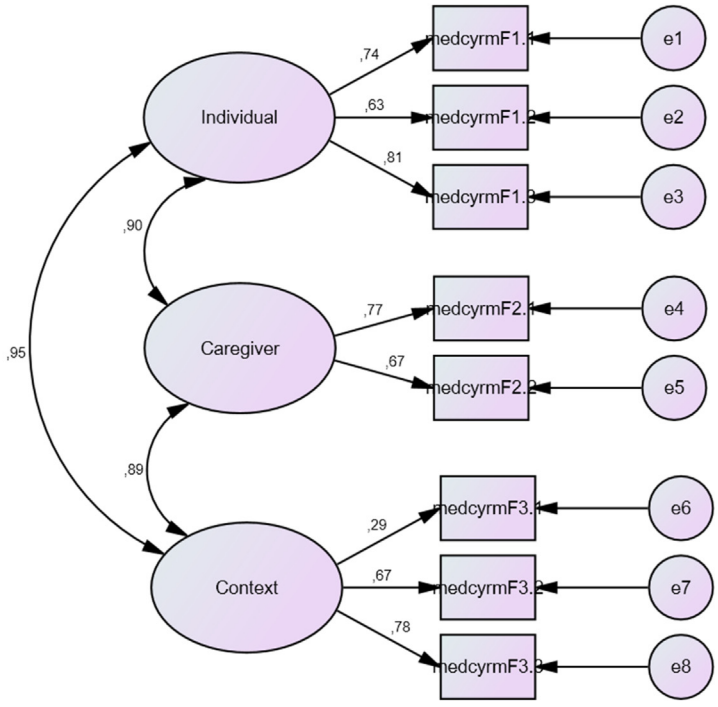

Figure 1. Model 1. Confirmatory factor analytical model of the Child and Youth Resilience Measure-28.

Table 4. Reliability of the CYRM-28 scale.

Scale/Factor	Cronbach alpha	N of elements
CYRM-28	.889	28
f1. Individual	.810	11
f2. Relations with primary caregivers	.792	7
f3. Contextual	.700	10

3.2. Confirmatory model

Model 1 presented a good fit (See Figure 1). The predetermined model is significant (Chi-squared = 60,170, df = 17, $p < .001$; CFI = .960, TLI = .934, IFI = .961, RFI = .911, and NFI = .946; RMSEA = .084). All these measures indicate a good model fit (Hu and Bentler, 2009; Marsh et al., 2004; Schreiber et al., 2006).

Considering that 3 factors were doubtful for youth and adolescents (they expressed it in the realization of the CYRM), we conducted a confirmatory analysis of Model 2 (see Figure 2), placing items 16, 19, and 28 in the first factor (individual). The results of the proposed Model 2 are as follows: Chi-squared = 1047.929, df = 347, $p < .001$; CFI = .763, TLI = .742, IFI = .765, RFI = .911, and NFI = .686; RMSEA = .074 (Table 5). As Tables 5 and 6 show, the results are poorer than in Model 1 above; therefore, the original structure the authors proposed seems optimal.

In summary, the reliability analyses show that the CYRM-28 scale and its subscales are internally consistent, and the overall results of the

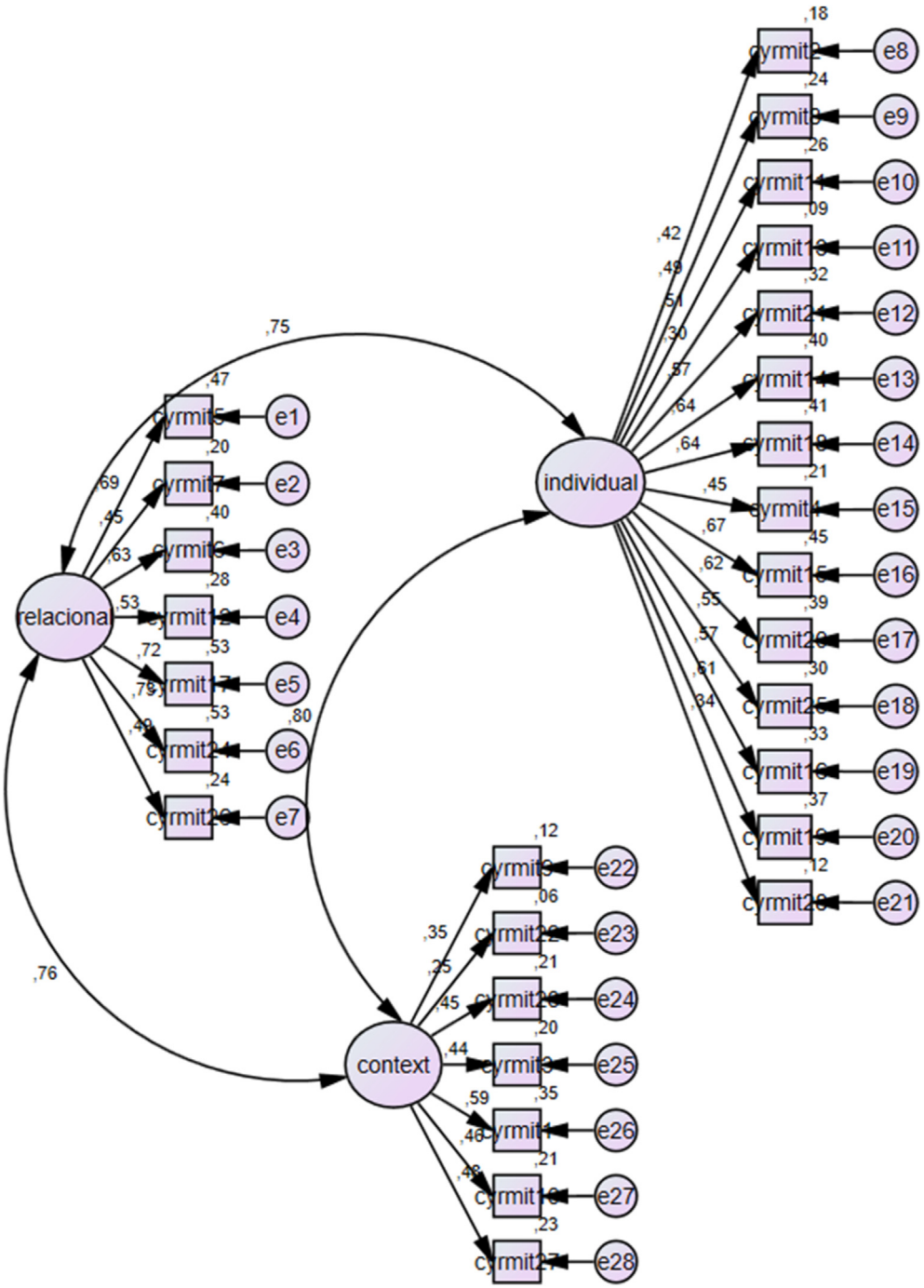

Figure 2. Model 2. Confirmatory factor analytical model of the Child and Youth Resilience Measure-28.

Table 5. Model Fit Summary Statistics of CYRM-28 Confirmatory Factor Analysis. Goodness-of-Fit Value, Goodness Fit Index (GFI), Incremental Fit Index (IFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) for full model.

Models	Absolute fit measures			Incremental fit measures			Parsimonious fit measures			
	Chi-squared $\chi 2$	df	RMSEA	CFI	TLI	NFI	PRATIO	PCFI	PNFI	AIC
Model 1	60.170	17	.084	.960	.934	.946	.607	.583	.574	114,170
Model 2 (with 3 items readjusted from factor 3 to factor 1)	1047.929	347	.074	.763	.742	.686	.918	.700	.629	1165,929

Table 6. Comparative Confirmatory Factor Analysis of the validation studies previously conducted.

	Models	Chi-squared $\chi 2$	df	RMSEA	CFI	AIC
MODELS PROPOSED IN THIS STUDY	Model 1 → CYRM 28 items and 3 factors	60.170	17	.084	.960	114,170
	Model 2 (with 3 items readjusted from factor 3 to factor 1)	1047.929	347	.074	.763	1165,929
PREVIOUS MODELS	Canadian Model (Liebenberg et al., 2012)	600.229	339	.057	.775	790.229
	Aotearoa New Zealand Model (Sanders et al., 2017a,b)	553.931	344	.051	.811	733.931
	Iranian Model (Kazerooni et al., 2017)	140.475	352	.083	.886	-
	South Africa Model (Govender et al., 2017)	2557.60	347	.059	.832	2675.60
	Indigenous Australian Model (Langham et al., 2018)	133.4	88	.047	.922	-
	South African Model (van Rensburg et al., 2019)	602.784	345	.056	.778	780.784

confirmatory analyses (CFA) provide strong support for the original scale model.

4. Discussion

The findings of this study on Spanish youth confirm the consistency of the CYRM-28 resilience scale's 3-factor structure (Garmezy, 1983; Luthar et al., 2000; Rutter, 2012; Werner, 2000) used with young people in various parts of the world (Ungar, Liebenberg, et al., 2008; 2011). We confirmed Hypothesis 1 (H1). The reliability analyses show that the CYRM-28 scale and its factors are internally consistent, as other studies have also shown (Liebenberg et al., 2012; Sanders et al., 2017a).

Regarding the second hypothesis (H2), results from confirmatory analysis in this study suggest and confirm a structure with 3 factors or 3 subscales—individual, relational, and contextual—as the authors established in the original scale. Therefore, we could say that the first factor, containing individual personal characteristics, encompasses 3 subfactors: personal skills (5 items), peer support (2 items), and social skills (4 items). The second factor (relationship with primary caregivers) comprises two subfactors: physical care received (2 items) and psychological care (5 items). Finally, the third factor (contextual) is divided into three subfactors: spiritual (3 items), education (2 items), and cultural (5 items) (Kazerooni et al., 2017).

In this regard, we confirm that this is a transnational scale that is applicable to youth from various cultures, including Spanish youth.

Although three of the items in the exploratory analysis showed greater weight in a different factor, the confirmatory analysis produced favorable results that corroborate the original structure's adequacy. We confirmed Hypothesis 2 (H2), as did studies conducted on youth from Canada (Liebenberg et al., 2012) and New Zealand (Sanders et al., 2017a, b) but not the study of Spanish youth Llistosella et al. (2019) published.

4.1. Limitations

Although the results of this study are favorable—validity of the CYRM-28 is proven, and its structure has been replicated—the study has limitations. It is based only on an incidental sample of Spanish youth and therefore needs to be replicated in more samples of young people, nationally and internationally, for the instrument to be considered a cross-culturally relevant measure of resilience. Another limitation of this study is decompensation in the sample (71% of the participants were boys).

5. Conclusion

This study underscores the following realities: the importance of developing the capacity of resilience in young people, by which they can face adversity, such as in the current pandemic situation that we are experiencing, as well as the need for an assessment that reveals young people's characteristics and needs so that adequate educational guidelines and intervention can be proposed when needed. Therefore, it is important to conduct studies that provide valid, reliable information on the quality of instruments used to assess and measure resilience because this is the first step for intervention.

The CYRM scale presents good psychometric properties. This scale is of particular interest because it highlights the importance of external factors as a form of protection, unlike other scales that assess only internal factors of resilience. The CYRM-28 scale, when used in research and assessment, complements the needs and risk assessments of youth populations by identifying existing external components that are available to youth and can be developed through intervention and changes in social policy. In addition, this instrument could be used longitudinally to measure program effectiveness before and after the intervention.

Finally, it includes an adequate number of items and an existing protocol (instruction book to be read prior to application), offering young people an introduction to the research and equipping them with contextualization and comprehension of the scale.

5.1. Applicability

This study first corroborates the importance of research in education and psychology as a means to obtain and understand people and their behavior. This research cannot be carried out without the development and application of adequate, reliable, and valid techniques and instruments that help us understand and detect young people's needs and characteristics and establish better interventions when needed (Pérez Juste et al., 2012).

Second, although we consider that the CYRM-28 resilience scale is an adequate cross-cultural scale to measure young people's resilience

capacity, it is difficult to select a single instrument that adapts perfectly to the sample's characteristics and the research objectives. We recommend, therefore, that a combination of instruments be applied to measure resilience adequately (Warren and Hale, 2020; Smith at al., 2010) to create a synergy whereby this complex concept can be better understood.

Finally, we consider that resilience, always but now more than ever in the current situation of change, emerges once again as an indispensable capacity that people need to face adversity in a positive way. We must know how to adapt and overcome adversity, learn from mistakes, and emerge stronger.

Declarations

Author contribution statement

All authors listed have significantly contributed to the development and the writing of this article.

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Data availability statement

The data that has been used is confidential.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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