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ORIGINAL PAPER

Validation Evidence of a Positive Youth Development Scale Among Latin American Adolescents

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Abstract

Background The positive youth development (PYD) framework orients developmental scholarship to focusing on youth's strengths rather than deficits, however, validity evidence on PYD measures among ethnic-minority youth is limited.

Objectives The objectives of the current study were to (a) examine the factor structure of a PYD measure within a Latin American adolescent sample and (b) test associations between PYD constructs and adjustment indicators.

Methods The sample included 288 Latin American students from the Southwest (M_{age} = 13.69 years, SD = 0.56; 47.7 female; 86.3% U.S.-born). Participants reported their PYD (i.e., Competence, Confidence, Character, Connection, and Caring) and academic performance. Mothers reported on youth's internalizing and externalizing behaviors. The internal structure of the PYD measure was assessed through confirmatory factor analyses (CFAs) and model comparisons. Criterion evidence was evaluated via regressions between the Five C's, academic performance, internalizing, and externalizing behaviors.

Results The five-correlated factor structure best fit the data with certain modifications. Character was negatively associated with externalizing behavior. All C's were positively related to academic performance.

Conclusions The results provide empirical support for the five-correlated factor model within a sample of Latin American adolescents, but modifications were necessary to maximize model fit. Dropping items within the *values diversity* subscale highlight the need for cultural assets within PYD measurement models for ethnic-minority youth, to best reflect their appraisals of diversity as minoritized individuals. Additionally, our findings suggest that the C's are salient to specific indices of Latin American adolescents' adjustment.

Keywords Adolescents · Latin American/Latino/Latina/Latinx · Measurement · Positive youth development

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Introduction

The emergence of positive youth development (PYD) research has continued a fundamental change in developmental scholarship over the past several decades since the inception of the Developmental Assets framework (Syvertsen et al., 2021). The objective of PYD approaches is to leverage youth's strengths to optimize functioning, in lieu of a focus on solely preventing negative adjustment outcomes. This shift in focus to examining links between assets and thriving, as opposed to exclusively examining factors underlying risk behaviors, is important given calls to move away from deficit narratives that have predominated research on youth of color, including Latin American[1] youth (Rodriguez & Morrobel, 2004). The Latin American population comprises the youngest ethnic group within the U.S., as 32.4% of the U.S. Latin American population is younger than 18 years old which is larger than the proportions of youth within other ethnic groups (Patten, 2016). As Latin American adolescents constitute a significant proportion of the youth population, ensuring their healthy development is crucial.

PYD frameworks show promise in redirecting research on Latin American youth to being assets-based, however methodologically, prior to utilization of these frameworks, the field must ensure that PYD measures are psychometrically tested and that different sources of validity evidence are examined within Latin American youth samples. Psychometrically sound measures of PYD are needed to accurately capture the same constructs across ethnic groups to illuminate the strengths of youth from diverse populations (Syversten et al., 2021), and validation work to date on PYD measures has been conducted within majority-White youth samples. As such, the broader purpose of this study is to validate[2] the score interpretation of an established PYD measure within a Latin American youth sample. The specific objectives of the current study are to assess two distinct sources of validity evidence by (a) examining the internal structure of a renowned measure of PYD within a Latin American adolescent sample and (b) investigating criterion evidence with key indices of adolescent well-being.

The Five C's Model of Positive Youth Development (PYD)

Scholars have put forward several PYD models, however, the Five C's model of PYD developed by Lerner and colleagues (2005) has become one of the most widely used frameworks in youth development research and programming (Heck & Subramaniam, 2009). The Five C's model of PYD operationalizes thriving (i.e., the growth of attributes that mark a healthy person) as indexed by five characteristics: Competence, Confidence, Character, Connection, and Caring (Lerner et al., 2005). These "C's" are terminology utilized by practitioners, adolescents in youth development programs, and their parents in

[1] Here, the term Latin American refers to people with Latin American or Spanish Caribbean origin, cultural or ethnic identity in the United States, as well as those who self-identify as Latino, Latina, Latinx, Latine, Chicano, Chicana, Chicanx, and/or Hispanic.

[2] We acknowledge the definition of validity, per the Standards of Educational and Psychological Testing (2014), as the degree to which theory and evidence support score interpretation of a measure. Support of the validity argument requires accumulating evidence on different dimensions of validity (e.g., related to the internal structure, relationships with criterion variables). Herein, we use the terms construct validity and criterion validity, but recognize they are distinct sources of validity evidence.

characterizing "thriving youth" (King et al., 2005; Roth & Brooks-Gunn, 2003). Grounded in relational developmental systems theories, Lerner and Lerner's Five C's model posits that when the individual strengths of youth align with their ecological assets, the resulting adaptive regulations drive positive developmental trajectories, indicated by the manifestation of the "Five C's" (Lerner et al., 2014). Briefly, *Competence* refers to a positive view of one's actions in specific areas (e.g., academic, social, etc., Lerner et al., 2005). *Confidence* captures one's sense of self-worth and self-efficacy (Lerner et al., 2005). *Connection* relates to positive bonds with people and institutions such as peers, school, and family (Lerner et al., 2005). *Character* reflects one's standards for correct behaviors, respect for societal and cultural rules, as well as one's sense of morality and integrity (Lerner et al., 2005). *Caring* taps into one's degree of sympathy and empathy for others (Lerner et al., 2005).

Internal Structure of the Five C's

As support for strengths-based approaches within research on adolescence has grown, the need for studies that evaluate the quality of PYD measures remains a priority (Syvertsen et al., 2021). Several studies have assessed the factor structure of the Five C's and its associated scales, mostly based on data from the 4-H study of Positive Youth Development. The 4-H study is a longitudinal investigation of adolescents, from grades 5 to 12, which sought to identify the individual and ecological foundations of healthy positive development as well as those that mitigate risk behaviors (Lerner et al., 2005). Using Wave 1 of the data, Lerner and colleagues (2005) proposed and found empirical support for a higher-order measurement model of PYD consisting of five first-order latent constructs (i.e., one for each C), which then converged onto a higher-order global PYD construct. The higher-order PYD model assumes that youth's overall level of PYD (i.e., thriving) drives variance in each of the C's (i.e., Caring, Competence, Confidence, Character, and Connection), and the magnitude of each lower-order "C" then influences scores on their respective indicators. Later studies using 4-H data found that the higher-order structure of PYD was invariant over grades 5–7 (Phelps et al., 2009) as well as grades 8–10 (Bowers et al., 2010).

Geldhof and colleagues (2014a) later examined the tenability of a bifactor model relative to other factor structures using the short-form (PYD-SF) and very short-form (PYD-VSF) versions of the PYD measure utilized in the original 4-H study. In the bifactor model, all the indicators across the Five C's load onto a higher-order construct of global PYD as well as their corresponding lower-order "C" construct, which then represent residual "C" constructs after controlling for global PYD (Geldhof et al., 2014a). Thus, within the bifactor framework, the items have two sources of true-score variance, the higher-order PYD construct and their respective "C's" (Geldhof et al., 2014b). Geldhof and colleagues (2014b) asserted that the bifactor model is more theoretically consistent with Lerner and Lerner's Five C's model, given that in this factor structure variance in PYD items are driven by the global PYD factor as well as their respective C's, and the residual C constructs can covary independently with key criterion indices of adolescent well-being. Their study directly compared different factor structures of the Five C's (i.e., five-correlated factor model, higher-order PYD model, and the bifactor model). The results showed that whereas the five-correlated factor model (i.e., five correlated latent factors for each C) fit the data superior to the higher-order PYD model, ultimately the bifactor model provided the best statistical fit (Geldhof et al., 2014a). Additionally, Geldhof and colleagues

(Geldhof et al, 2014b) assessed correlations between the residual C constructs, which seemed to cluster in two groups. Competence and Confidence (i.e., relating to adolescents' sense of efficacious self-concept) were highly correlated with each other while Caring and Character (i.e., socioemotional constructs) showed strong pairwise correlations, and Connection positively correlated with each group (Geldhof et al., 2014b).

The Five C's and Youth Adjustment Outcomes

Various studies (e.g., 4-H study, college-age student studies, international youth studies) have also established the Five C's associations with criterion variables related to developmental outcomes. Again, Lerner and Lerner (2005) posit that thriving youth (i.e., youth with high levels of the Five C's) display developmental trajectories indicated by less maladjustment (e.g., risk behavior engagement, depression) and increased positive functioning (e.g., Contribution). For example, studies have shown that global PYD is promotive of positive adjustment outcomes such as Contribution (Jeličić et al., 2007; Lerner et al., 2013) and self-regulation (Lerner et al., 2013), and negatively associates with indicators of maladjustment such as delinquency and substance use (Jeličić et al., 2007), depressive symptoms (Dvorsky et al., 2019; Jeličić et al., 2007), anxiety, and emotion dysregulation (Dvorsky et al., 2019). Research has also shown that the C's may relate differentially to adjustment outcomes (Geldhof et al., 2014b). Over 5th to 12th grade, Confidence and Competence (i.e., efficacious constructs) weakly to moderately correlated with Contribution and problem behaviors while showing a strong negative correlation with depressive symptoms (Geldhof et al., 2014b). Character and Caring (i.e., socioemotional constructs) displayed moderate correlations with Contribution and depressive symptoms but were unrelated with problem behaviors (Geldhof et al., 2014b). Connection was moderately and positively correlated with Contribution and increasingly negatively correlated with depressive symptoms over adolescence, whereas generally being unrelated with problem behaviors (Geldhof et al., 2014b). The Five C's have also been theorized to be promotive of youth's academic performance (Bowers et al., 2015). Among Slovenian adolescents, Character and Confidence were positively associated with math achievement (Kozina et al., 2019). Taken together, the literature suggests that the C's relate to important indicators of adolescent adjustment.

The Five C's and Minoritized Youth

Although the aforementioned studies provide evidence of the Five C's construct and criterion validity, a significant limitation of this body of work is its reliance on a singular dataset. Approximately two-thirds of the 4-H sample was White, with less than 10% identifying as Black or Latin American (Lerner et al., 2017). The participants were also uniform in other demographic factors, as most came from highly educated families, middle to high socioeconomic statuses, and rural or suburban communities (Spencer & Spencer, 2014). Thus, the 4-H study may not generalize to non-White youth, and a substantial research gap persists regarding the applicability of Lerner and Lerner's formulation of PYD and the Five C's among minoritized youth (Spencer & Spencer, 2014; Travis & Leech, 2014), including U.S. Latin American adolescents. Thus, the construct validity of the Five C's and their relations to indices of adolescent well-being

remains unknown among Latin American youth specifically. This represents an important research question as the Five C's model has been utilized to conceptualize youth development programs targeting Latin American adolescents, such as the *Adelante* intervention (Edberg et al., 2017). The activities of the *Adelante* intervention sought to maximize the C's (specifically Competence, Confidence, Connection, and Contribution) among Latin American youth, which were hypothesized to reduce risk behaviors (Edberg et al., 2017). Therefore, research substantiating the empirical validity of the Five C's and their associations with healthy adjustment among Latin American adolescents is important, given the use of the Five C's in designing youth interventions (Heck & Subramaniam, 2009).

To address the question of the Five C's applicability among Latin American youth, within-group analyses among Latin American samples are critical, which are not possible with the constraints of the 4-H dataset (Spencer & Spencer, 2014). Due to sociocultural and demographic factors, the qualitative meaning of the Five C's, and by extension the Five C's measurement properties and relations to developmental outcomes, may differ among Latin American youth relative to the majority-White sample of the 4-H study (Spencer & Spencer, 2014). It is also important to note that the substantive meaning of the Five C's was derived from qualitative work conducted on youth practitioners, adolescents, and their parents who were primarily White (King et al., 2005). As a result, the attributes of thriving youth as delineated by the Five C's are based upon the conceptualizations of White individuals, which could be incongruent with those of Latin American youth. More specifically, Latin American youth develop in unique contexts characterized by specific assets (e.g., cultural values, ethnic identity) and stressors (e.g., ethnic discrimination) that the current iteration of the Five C's model does not incorporate. For example, scholarship has shown that many Latin American families endorse collectivism (Raeff et al., 2000) and promote familism values (i.e., a cultural value emphasizing duty towards family members) among Latin American children (Calderón-Tena et al., 2011). In turn, research has demonstrated that within Latin American youth, higher levels of familism are promotive of prosocial behaviors (Knight et al., 2015), or actions intended to benefit others which relate to elements of the Five C's. Latin American youth's cultural values (e.g., familism) may map onto the Five C's (e.g., Caring or Connection) and inform their conceptualization of attributes that characterize thriving youth. In other words, their cultural orientation could influence their responses to existing assessments of the Five C's, further highlighting the need for work that assesses the tenability of the Five C's model within Latin American youth specifically to identify potential measurement model variation.

Prior research examining the factor structure of PYD measures with samples of international youth and multiethnic samples within the U.S. highlights important conceptual and measurement differences relative to the findings from 4-H studies. For example, Wong and colleagues (2022) administered the PYD-VSF among adolescents in Hong Kong and while there were some similarities to the measurement model identified by Geldhof et al., (2014b; e.g., the item related to *peers* weakly loaded onto the Connection factor), an important difference within their study was that the *values diversity* item within the Character subscale weakly loaded. Additionally, Williams et al. (2014) found that their indicator of *values diversity* (an item from the Multigroup Ethnic Identity Measure; Phinney, 1992) dually loaded onto a unidimensional factor of global PYD and ethnic identity in a two-factor measurement model utilizing data from Black and Latin American male adolescents (i.e., age 14). Thus, to assess if Lerner and Lerner's conceptualization of PYD is appropriate for Latin American adolescents specifically, it is necessary to examine the Five

C's dimensionality and their associations with relevant outcomes within a Latin American youth sample, which studies to date have not addressed.

Current Study

This study seeks to illuminate the salience of the Five C's for Latin American youth. To overcome the limitations outlined by Spencer and Spencer (2014), the current study implemented the PYD-SF (Geldhof et al., 2014a) within a sample of Latin American adolescents. This approach is significant in that it is the first study to examine the Five C's validity within a homogenous Latin American youth sample, which is an important step in evaluating the applicability of measures of the Five C's across different racial/ethnic groups of youth. Thus, the current study had two aims: a) to empirically test and compare different factor structures, guided by seminal measurement work and modification indices, of the Five C's model (i.e., five-correlated factors model, higher-order PYD model, or bifactor model) within a sample of Latin American adolescents and b) to examine the finalized measurement model's evidence of criterion validity with important indices of adolescent well-being that have been theorized to covary with the Five C's (i.e., externalizing behavior, internalizing behavior, and academic performance).

Method

Participants

Data for the current study came from a three-wave longitudinal study of 329 families (i.e., parent–child dyads) examining academic identity and achievement among Latin American adolescents from the Southwestern U.S. Eligibility criterion for families included: (a) having a child in the eighth-grade, (b) having at least one biological and/or long-term legal guardian living with the child, and (c) having at least one biological parent with origins from Latin American or Spanish Caribbean countries. During 2015–2016, participants were recruited from five school districts in the Southwestern U.S. Bilingual (English and Spanish) research assistants contacted families telephonically using the school districts' open records data ($N = 1598$ families). Eligible families (i.e., those who were screened and met the inclusion criteria) included 531 families (33% of initial rosters). Of the 531 eligible families who met the study's inclusion criteria, 329 families (62%) completed interviews. Of those families, 46.5% were comprised of two participating parents, 45.0% with only a participating mother, 7.9% with only a participating father, and 0.6% with no participating parent. For adolescents, 88.7% of families had a participating adolescent (53.8% girls). The current study used adolescent reported data from Time 1 (T1).

All participating adolescents ($N = 288$) were of Latin American origin (38% Mexican/Mexican American, 55% Hispanic/Latin American/Chicanx/Other, and 7% Mixed/Other). The majority only identified with their Latin American origin (93.3%), with a small proportion also identifying with U.S. racial categories (4% White, 1.4% African American, 0.3% Native American, and 0.7% Mixed/other). At T1 adolescents were in the 8th grade, their ages were 13 (35%), 14 (58%), and 15 (5%) years old ($M = 13.69$, $SD = 0.56$). Five participants did not report their age (2%).

Procedures

At T1, undergraduate and graduate research assistants contacted adolescent participants' parents to confirm eligibility, obtain consent, and complete parent surveys through telephone interviews. After obtaining consent, research assistants contacted adolescents to get their assent and verbally administered survey questions by telephone. Measures were translated into Spanish using established forward and backward translation methods (Knight et al., 2010) and were available to all participants (i.e., parents and adolescents) that requested to take the survey in Spanish. Interview responses were documented using the online data collection website *Qualtrics* (Qualtrics Inc., 2017). Participating families received a $25 gift-card to a local store as compensation. All study procedures were reviewed and approved by the University's Institutional Review Board (IRB# 2014D2548).

Measures

Positive Youth Development

Participants reported their levels of Caring, Competence, Confidence, Character, and Connection based on the 34-item PYD-SF (Geldhof et al., 2014a). The PYD-SF is an abbreviated version of the PYD measure utilized by Lerner and colleagues (2005) to assess youth's levels of the Five C's. Each C, except for Caring, is composed of 2-item subscales to assess different dimensions of the C's (Table 1). The current study also included measures of key indices of adolescent well-being to provide evidence of criterion validity (i.e., externalizing behavior, internalizing behavior, and academic performance).

Caring

Six items represented Caring (e.g., "It bothers me when bad things happen to any person"). Participants reported the degree to which the items applied to them. Responses ranged from 1 = *not at all like me* to 5 = *very much like me*.

Competence

Six items assessed aspects of Competence, spanning academic competence (e.g., "I am just as smart as others my age"), social competence (e.g., "I have a lot of friends"), and physical competence (e.g., "I am better than others my age at sports") subscales. Participants reported how much they agreed or disagreed with the items. Responses ranged from 1 = *strongly agree* to 5 = *strongly disagree*. Items were reverse coded so that higher scores indicated higher levels of Competence.

Confidence

Six items assessed Confidence, encompassing appearance (e.g., "I am good looking"), self-worth (e.g., "I am happy with myself most of the time"), and positive identity (e.g., "All in all I am glad I am me") subscales. Participants reported how much they agreed or disagreed with the items on a Likert scale from 1 = *strongly agree* to 5 = *strongly disagree*. Items were reverse coded so that higher scores reflected higher levels of Confidence.

Table 1 PYD-SF items and corresponding subscales

Item	Subscale
Caring	
When I see someone being taken advantage of, I want to help them	–
It bothers me when bad things happen to any person	–
I feel sorry for other people who don't have what I have	–
When I see someone being picked on, I feel sorry for them	–
It makes me sad to see a person who doesn't have friends	–
When I see another person who is hurt or upset, I feel sorry for them	–
Character	
Helping to make the world a better place to live in	Social conscience
Giving time and money to make life better for other people	Social conscience
Doing what I believe is right even if my friends make fun of me	Personal values
Accepting responsibility for my actions when I make a mistake or get in trouble	Personal values
I hardly ever do things I know I shouldn't do	Conduct behavior
I usually act the way I am supposed to	Conduct behavior
Knowing a lot about people of other races	Values diversity
Enjoying being with people who are of a different race than I am	Values diversity
Connection	
I get a lot of encouragement at my school	School
Teachers at my school push me to be the best I can be	School
I have lots of good conversations with my parents	Family
In my family I feel useful and important	Family
Adults in my town or city make me feel important	Neighborhood
Adults in my town or city listen to what I have to say	Neighborhood
I feel my friends are good friends	Peers
My friends care about me	Peers
Confidence	
I am good looking	Appearance
I really like the way I look	Appearance
I am happy the way I am	Self-worth
I am happy with myself most of the time	Self-worth
All in all I am glad I am me	Positive identity
When I am an adult, I'm sure I will have a good life	Positive identity
Competence	
I am better than others my age at sports	Athletic
I could do well at just about any new athletic activity	Athletic
I do very well in my class work at school	Academic
I am just as smart as others my age	Academic
I have a lot of friends	Social
I am popular with others my age	Social

Connection

Eight items measured Connection regarding school connectedness (e.g., "I get a lot of encouragement at my school"), neighborhood connectedness (e.g., "Adults in my town or city make me feel important"), family connectedness (e.g., "I have lots of good conversation with my parents"), and peer connectedness (e.g., "I feel my friends are good friends"). Participants responded to the items regarding their school, neighborhood, and family using response options from 1 = *strongly agree* to 5 = *strongly disagree*. Participants responded to items within the peer's subscale on a scale of 1 = *always true* to 5 = *almost never true or never true*. Items were reverse coded so that higher scores indicated higher levels of Connection.

Character

Eight items examined Character, including the values diversity (e.g., "Knowing a lot about people of other races"), personal values (e.g., "Doing what I believe is right even if my friends make fun of me"), social conscience (e.g., "Giving time and money to make life better for other people"), and conduct behavior (e.g., "I hardly ever do things I know I shouldn't do") subscales. Participants responded to items regarding conduct behavior using response options ranging from 1 = *strongly agree* to 5 = *strongly disagree*. When answering questions about social conscience and personal values, responses were on a Likert scale of 1 = *not important* to 5 = *extremely important*. For items assessing values diversity, response options spanned 1 = *not at all like you* to 5 = *very much like you*. Items within the conduct behavior subscale were reverse coded so that higher levels of all items reflected higher levels of Character.

Externalizing Behavior

Mothers reported on their adolescents' externalizing behavior using the 24-item externalizing behavior subscale of the Shortform Assessment for Children (Glisson et al., 2002). Mothers responded to items gauging the frequency of their adolescent's engagement in negative behaviors (e.g., "Fights a lot"), with response options ranging from 0 = *never occurs* to 2 = *often occurs*. The items were summed with higher scores indicating greater externalizing behaviors.

Internalizing Behavior

Mothers reported on their adolescents' level of internalizing behavior using the 24-item internalizing behavior subscale of the Shortform Assessment for Children (Glisson et al., 2002). Mothers responded to items indicating the frequency of their adolescent's behavior indicative of internalizing issues (e.g., "Is sad, unhappy, or feels down"), with response options ranging from 0 = *never occurs* to 2 = *often occurs*. The items were summed so that higher scores indicated greater internalizing behaviors.

Academic Performance

Adolescent's academic performance in school was examined through a single item (i.e., "What grades do you earn in school?"). Adolescents provided their perception of their general academic performance with the following responses: 1 = *Mostly As*, 2 = *About half As and half Bs*, 3 = *Mostly Bs*, 4 = *About half Bs and half Cs*, 5 = *Mostly Cs*, 6 = *About half*

Cs and half Ds, 7 = *Mostly Ds*, 8 = *Mostly below Ds*. The item was reverse coded so that higher scores indicated superior academic performance.

Analytic Plan

The factor structure of the PYD-SF was assessed through a series of confirmatory factor analyses (CFAs) using the "lavaan" package in R (R Core Team, 2020). Missing data were handled via full information maximum likelihood (FIML; Enders, 2010), which at most was less than 1% (0.7%) of the entire sample at the item level. In the first stage, we conducted five separate CFAs with each C as an independent latent factor (i.e., Caring, Competence, Confidence, Character, and Connection). In the second analytic stage, we utilized the finalized measurement models of each C established in the first analytic stage to test three predetermined factor structures based upon prior research (Geldhof et al., 2014a; Lerner et al., 2005): a) a five-correlated factors model of the Five C's b) a higher-order factor model with the PYD-SF items loading onto their respective C, and the latent factors of the Five C's in turn loading onto a global PYD factor and c) a bifactor model where each PYD-SF item simultaneously loaded onto a global PYD factor and also their corresponding C.

At each stage, we examined the model fit indices, factor loadings, and modification indices to determine if modifications were needed to improve the measurement models (e.g., dropping items and/or adding residual covariances). We evaluated model fit per the following standardized fit indices: the chi-square statistic, the root-mean-squared error of approximation (RMSEA < 0.08 MacCallum et al., 1996), the comparative fit index (CFI > 0.90; Bentler, 1990), and standardized root mean square residual (SRMR < 0.08; Hu & Bentler, 1999). We also appraised the strength of the factor loadings and maintained items with a factor loading of 0.30 or greater within the measurement models, criteria utilized in prior measurement work on assets of positive youth development (Syversten et al., 2021). Statistical significance for factor loadings was established at the $p < 0.001$ level. In the second stage, when comparing the relative fit of two factor structures (e.g., five-correlated factors model vs. higher-order PYD model), we utilized the Akaike Information Criteria (AIC) values (with lower AIC indicating the superior model fit) and chi-square difference tests.

The last analytic stage examined criterion validity. Latent regression analyses examined the unique associations between PYD constructs with externalizing behaviors, internalizing behaviors, and academic performance. Externalizing behaviors, internalizing behaviors, and academic performance were simultaneously included as outcome variables (i.e., to account for covariance between the adjustment indicators) to the measurement model that provided the best fit to these data in the second analytic stage.

Results

Tables 1–6 in Online Resource 1 summarizes the inter-item correlations, means, and standard deviations of PYD-SF items by C, as well as the sum scores of the C's with the criterion validity variables.

CFAs of the Five C's

In the first analytic stage, the CFAs for certain individual C's resulted in specific modifications to achieve optimal model fit. Consistent with prior measurement work (Bowers et al., 2010; Geldhof et al., 2014a, 2014b), we included residual covariances for items within the same subscales for the measurement models of Competence, Character, Confidence, and Connection to account for shared method variance. After including the residual covariances, an item within the diversity subscale of Character (i.e., "Knowing a lot about people of other races") weakly loaded ($\lambda = 0.17$) and was dropped. After these modifications were made, the models for each C met standards for good model fit: Caring ($\chi^2 = 25.01$ (9), $p < 0.01$; CFI = 0.97; RMSEA = 0.08 [90% CI: 0.04–0.12]; SRMR = 0.03), Character ($\chi^2 = 16.50$ (11), $p > 0.05$; CFI = 0.98; RMSEA = 0.04 [90% CI: 0.00–0.08]; SRMR = 0.03), Connection ($\chi^2 = 29.84$ (16), $p > 0.05$; CFI = 0.98; RMSEA = 0.06 [90% CI: 0.02–0.09]; SRMR = 0.03), Confidence ($\chi^2 = 9.84$ (6), $p > 0.05$; CFI = 0.10; RMSEA = 0.05 [90% CI: 0.00–0.10]; SRMR = 0.02), Competence ($\chi^2 = 10.54$ (6), $p > 0.05$; CFI = 0.99; RMSEA = 0.051 [90% CI: 0.00–0.10]; SRMR = 0.02). All factor loadings across the models were statistically significant ($p < 0.001$) and greater than 0.30.

Identifying the Factor Structure

We utilized the measurement models finalized in the first analytic stage to test three distinct factor structures in the second analytic stage. We first estimated the five-correlated factors model as the baseline model ($\chi^2 = 837.15$ (472), $p < 0.05$; CFI = 0.89; RMSEA = 0.05 [90% CI: 0.05–0.06]; SRMR = 0.07). Prior to any modifications, this model had adequate fit but did not meet all standards for good model fit (i.e., CFI < 0.90). The modification indices suggested that remaining item of the *values diversity* subscale (i.e., "Enjoying being with people who are of a different race than I am") cross-loaded with the Caring factor. After dropping this item, the model fit of the five-correlated factors model displayed good model fit (i.e., increases in CFI and decreases in RMSEA as well as SRMR), $\chi^2 = 763.70$ (441), $p < 0.05$; CFI = 0.90; RMSEA = 0.05 [90% CI: 0.04–0.06]; SRMR = 0.06. The modification indices did not suggest any other conceptually or theoretically meaningful changes to the measurement model. Across the C's, all factor loadings were statistically significant ($p < 0.001$), ranging from 0.36 to 0.87. Additionally, all pairwise correlations between latent factors of the C's were positive and significant. The weakest correlation was between Caring and Confidence ($r = 0.19$) while Confidence and Competence (i.e., efficacious constructs) displayed the strongest correlation ($r = 0.78$). Caring and Character (i.e., socioemotional constructs) showed a moderate correlation ($r = 0.48$). Character correlated strongly with Confidence ($r = 0.60$) and Competence ($r = 0.63$). Caring correlated weakly with Connection ($r = 0.33$) and Competence ($r = 0.28$).

Next, we estimated the higher-order PYD model. Factor loadings of the items onto their respective latent factors of the C's were statistically significant ($p < 0.001$) and greater than 0.30 (0.35–0.88). The factor loadings of the C's onto the general PYD factor were also statistically significant ($p < 0.001$), ranging from 0.37 to 0.91. In comparing the relative fit of the five-correlated factors model and the higher-order PYD model, the AIC value was lower for the five-correlated factors model (22,176.31 vs. 21,489.89), suggesting better model fit. The chi-square difference test was also statistically significant, $\Delta\chi 2\ (5) = 25.09$,

$p < 0.01$, and further supported the better fit of the five-correlated factors model relative to the higher-order PYD model given the superior values across most fit indices.

Last, we estimated the bifactor model. We first attempted the traditional bifactor model (i.e., with latent factors orthogonal), however, this model did not converge due to the variance/covariance matrix being negative and/or estimated variances being negative. To address these issues, we also attempted to include correlations between the latent factors of the C's. Because the bifactor model never converged, we did not compare model fit between any iteration of the bifactor model and the five-correlated factors model. Thus, we concluded that the five-correlated factors model best fit these data. Table 2 summarizes the factor loadings and fit indices for the final five-correlated factors model.

Criterion Validity Analyses

Externalizing behavior, internalizing behavior, and academic performance were simultaneously added as outcomes to the five-correlated factors model to examine the association of each C and the above adjustment indices. Table 3 summarizes the results of the criterion validity analyses as well as the model fit. Overall, the model provided adequate fit to the data.

Regarding externalizing behavior (Table 3), Character displayed a negative association. Confidence, Caring, Connection, and Competence were not associated with externalizing behavior. None of the C's were associated with internalizing behavior (Table 3). Lastly, Caring, Connection, Confidence, Character, and Competence were all positively associated with academic performance (Table 3).

Discussion

PYD approaches to youth development research are critical to dismantling deficit-oriented narratives that have characterized studies on minoritized youth. Lerner and Lerner's (2005) Five C's model of PYD is the most empirically supported and widely used framework in youth development research (Heck & Subramaniam, 2009), however, low representation of minoritized youth within the 4-H study constrain what conclusions can be made regarding the salience of the Five C's among youth of color, including Latin American youth. The current study makes important contributions to the PYD literature and overcomes limitations of the 4-H study by examining the tenability of the Five C's model and comparing different factor structures, tested in foundational measurement works on the Five C's (Geldhof et al., 2014a, 2014b; Lerner et al., 2005) within a homogenous Latin American sample. The current study also tested associations between PYD constructs and adjustment outcomes among Latin American youth. Establishing criterion validity is critical to illuminate how applicable Lerner and Lerner's hypotheses are regarding thriving (as indexed by the Five C's) and its relation to healthy development within Latin American adolescents. The current study, to our knowledge, is the first to provide different sources of validity evidence regarding the internal structure of the Five C's and the developmental salience of the Five C's among Latin American youth specifically.

For the first aim, we examined which factor structure of the Five C's (i.e., five-correlated factor model, higher-order PYD model, or bifactor model) best fit these data within a Latin American adolescent sample. We first estimated the latent constructs of the Five

Table 2 Standardized factor loadings for the final five-correlated factors model

Item	Factor loading
Caring (ω = .90)	
When I see someone being taken advantage of, I want to help them	.42
It bothers me when bad things happen to any person	.57
I feel sorry for other people who don't have what I have	.51
When I see someone being picked on, I feel sorry for them	.76
It makes me sad to see a person who doesn't have friends	.82
When I see another person who is hurt or upset, I feel sorry for them	.77
Character (ω = .39)	
Helping to make the world a better place to live in	.45
Giving time and money to make life better for other people	.40
Doing what I believe is right even if my friends make fun of me	.44
Accepting responsibility for my actions when I make a mistake or get in trouble	.56
I hardly ever do things I know I shouldn't do	.48
I usually act the way I am supposed to	.62
Connection (ω = .75)	
I get a lot of encouragement at my school	.59
Teachers at my school push me to be the best I can be	.59
I have lots of good conversations with my parents	.65
In my family I feel useful and important	.73
Adults in my town or city make me feel important	.74
Adults in my town or city listen to what I have to say	.60
I feel my friends are good friends	.39
My friends care about me	.42
Confidence (ω = .53)	
I am happy with myself most of the time	.68
I am good looking	.39
I really like the way I look	.57
I am happy the way I am	.84
All in all I am glad I am me	.87
When I am an adult, I'm sure I will have a good life	.69
Competence (ω = .54)	
I am better than others my age at sports	.36
I could do well at just about any new athletic activity	.48
I do very well in my class work at school	.52
I am just as smart as others my age	.52
I have a lot of friends	.53
I am popular with others my age	.52

Model fit: $\chi^2(441) = 763.70$, $p < 0.001$; RMSEA = .05, 90% CI [0.04–0.06]; CFI = .90; SRMR = .06. ω = total McDonald's Omega from measurement model

C's independently, which required implementing residual covariances between items of the same subscale to achieve good model fit. This modification was also implemented in prior studies testing the factor structure of measures of the Five C's (Geldhof et al., 2014a; Lerner et al., 2005; Jeličić et al., 2007). Additionally, we dropped items that loaded weakly

Table 3 Summary of criterion validity analyses

	Externalizing behavior			Internalizing behavior			Academic performance		
PYD construct	*b*	*SE*	*β*	*b*	*SE*	*β*	*b*	*SE*	*β*
Caring	.01	.01	.06	.01	.01	.06	.24**	.06	.26
Connection	−.02	.01	−.12	.001	.01	.004	.20**	.06	.22
Confidence	−.01	.01	−.03	−.01	.01	−.08	.13*	.06	.14
Character	−.03*	.02	−.20	.01	.02	.05	.43**	.08	.42
Competence	−.01	.02	−.06	−.01	.06	−.09	.42**	.09	.42

$N = 329$ families. SE = standard error. Model Fit: $\chi^2(522) = 908.77$, $p < 0.001$; RMSEA = .05, 90% CI [0.04–0.05]; CFI = .89; SRMR = .06. *$p < .05$ ** $p < .001$

onto the C's or were suggested to cross-load onto other C's (i.e., items within the *values diversity* subscale of Character). The model comparisons showed that the higher-order PYD model was tenable (i.e., the model converged but did not meet all standards for good model fit), but the five-correlated factors model provided the best statistical fit to these data from the Latin American adolescent sample. Moreover, the bifactor model did not converge.

These results support different conclusions as compared to prior studies. Earlier studies successfully estimated a higher-order PYD model within the 4-H sample (Bowers et al., 2010; Lerner et al., 2005; Phelps et al., 2009). Geldhof and colleagues (2014a) conducted the first study that compared factor structures of the Five C's within the 4-H sample, and found that the bifactor model provided the best fit to the data. Additionally, the pattern of correlations among the C's slightly differed from prior studies (Geldhof et al., 2014b). The strong latent correlations between the efficacious C's (i.e., Competence and Confidence) emerged in our sample. The socioemotional C's (i.e., Caring and Character) were moderately correlated, however, Character displayed stronger correlations with Competence and Confidence. Therefore, the aggregate groups of efficacious C's and socioemotional C's was somewhat replicated, with the exception that Character was more correlated with the efficacious constructs.

The issues with the *values diversity* items not loading onto the Character factor are consistent with the study by Wong and colleagues (2022). They administered the PYD-VSF among adolescents in Hong Kong and found that select items did not adequately load onto the latent constructs of the residual C's, including the indicator of *values diversity* (i.e., "Enjoying being with people who are of a different race than I am"). The authors noted that this does not mean that racial diversity is not important to Hong Kong youth (Wong et al., 2022). They attributed the weak loading of this item to possibly the school context of Hong Kong students, given that they often do not attend school with peers of different races (Wong et al., 2022). Similarly, the findings of the current study do not suggest that understanding individuals of other races or being around people of different races is not a priority to Latin American adolescents. Rather, *valuing diversity* may not be relevant to Character (e.g., respect for societal and cultural rules). As members of minoritized groups within the U.S. who encounter pervasive ethnic discrimination, Latin American adolescents may be more attuned to broader society's systemic bias and poor treatment toward their ethnic groups. The *values diversity* items capture youth's knowledge of and affinity towards members of other racial groups. However, as recipients of ethnic discrimination,

Latin American adolescents may place higher awareness on other individuals' (specifically those of non-Hispanic White racial/ethnic groups) knowledge of their ethnic group and/or enjoying being around members of their ethnic group. It is important to contextualize the findings regarding the *values diversity* items within Latin American adolescents' social position as a minoritized ethnic group in the U.S. Lerner and Lerner's measure of PYD may not adequately reflect this context.

The lack of model fit displayed by the higher-order PYD and bifactor models could, in part, relate to scholars' critiques of Lerner and Lerner's model of the Five C's and youth development frameworks more broadly, specifically that most fail to include culturally relevant factors salient to youth identifying with minoritized groups (Williams et al., 2014; Garcia Coll et al., 1996). The model comparisons provided empirical evidence that imposing a global PYD (i.e., thriving) factor may not ideally explain variance in the C's among Latin American adolescents. While the latent correlations showed that the C's positively covaried, together the C's might not index global PYD among Latin American youth. The study by Williams and colleagues (2014) raises the possibility that uncaptured sociocultural assets within PYD measurement models could also explain variance in PYD indicators among youth identifying with minoritized ethnic groups. In their analysis, they examined whether ethnic identity functioned as an asset subsumed within a unidimensional PYD construct among Black and Latin American adolescent males, or if it was related but a separate construct from global PYD. The results suggested that a two-factor measurement model of global PYD and ethnic identity best fit the data, but that the indicator of *values diversity* (i.e., "I enjoy being around people from ethnic groups other than my own") dually loaded on the PYD and ethnic identity constructs (Williams et al., 2014).

In the current study, the items within the *values diversity* subscale did not strongly converge onto the Character factor and were ultimately dropped to achieve good model fit within the five-correlated factors model. While the measurement model identified by Williams et al. (2014) did not include lower-order constructs of the Five C's, their results suggest that PYD measurement models that include sociocultural assets as distinct latent factors could incorporate indicators of the C's (e.g., the *values diversity* items). Perhaps among Latin American adolescents, PYD and sociocultural assets function in tandem to maximize thriving (as operationalized by the Five C's), and in the absence of these assets, the five-correlated factors model (without the *values diversity* items) is the most appropriate for Latin American youth samples.

While a global PYD construct could not be estimated, the C's showed significant associations with certain criterion variables within the sample of Latin American youth. While the C's were not associated with internalizing behaviors, Character was associated with lower levels of externalizing behaviors. These findings vary from previous criterion analyses between the Five C's and adjustment. Geldhof and colleagues (2014b) utilized the bifactor model to assess correlations over time (5^{th} grade to 12^{th} grade) between the C's and criterion variables, including problem behaviors and depressive symptoms. The results showed that the efficacious C's (i.e., Confidence and Competence) displayed weak to moderate correlations with behavioral measures (problem behaviors), but increasingly strong negative correlations with depressive symptoms. The socioemotional C's (i.e., Character and Caring) moderately correlated (positively) with depressive symptoms while being generally unrelated to problem behaviors (Geldhof et al., 2014b). Connection was unrelated to problem behaviors and was negatively correlated with depressive symptoms (Geldhof et al., 2014b). Thus, both studies demonstrate that the C's can relate to indices of psychosocial well-being, but within the current study, the relationships between the C's, internalizing behaviors, and externalizing behaviors did not aggregate by efficacious C's and

socioemotional C's as Character was the only C to exhibit an association with externalizing behaviors.

Conversely, all the C's were positively associated with concurrent academic performance. Character displayed the largest effect size amongst all the C's in relation to academic performance, again indicating its enhanced salience to adjustment among Latin American adolescents relative to the other C's. However, past work has suggested that the Five C's can distinctly relate to students' academic performance based on school subject. Kozina et al.'s (2019) study examined associations between the Five C's and math achievement among Slovenian youth, where Character and Confidence were positively related to math achievement, while Connection was negatively associated with math achievement. Future work should examine the associations between the Five C's and grades in specific academic subjects among Latin American youth, to illuminate potential heterogeneity by academic area.

Limitations

Although this is one of the first studies to provide evidence of validity for Lerner and Lerner's (2005) model of the Five C's among Latin American adolescents, the results should be interpreted in light of the limitations. First, the relatively small sample size may have reduced the statistical power needed to adequately estimate, and thereby compare, more complex measurement models like the bifactor model. Additionally, the sample of the current study was grade homogenous. Lack of age variability could have also contributed to the relatively worse model fit or lack of convergence found with the higher-order model and bifactor model, respectively. Moreover, limited age variation constrains the generalizability of the findings to Latin American youth in other phases of adolescence regarding the dimensionality of the Five C's as well as their associations with adjustment outcomes. Future studies should test hierarchical measurement models of the Five C's in larger sample sizes of Latin American youth, with broader diversity in age, to conduct more robust tests of the internal structure. Another important step for future work is to conduct invariance testing of the Five C's within Latin American adolescent samples, to assess potential heterogeneity by characteristics such as age, gender, nativity, and language.

Additionally, it is important to note particular methodological and conceptual limitations. In our pursuit to evaluate the extent to which measurement models of the Five C's tested in prior works were applicable to Latin American adolescent samples, we examined modification indices, particularly when model fit of the prespecified factor structures was poor. However, modification indices tend to produce sample-specific findings as opposed to those that are widely generalizable. While it was our objective to attempt to replicate measurement models empirically supported in seminal PYD studies, and subsequently appraise modification indices when the prespecified factor structures were not tenable, it is critical to (and perhaps an important direction for future work) to assess the conceptual implications of these foundational works. For example, the inclusion of residual correlations within the five-correlated factors model introduces model complexity which challenges interpretation of the underlying C's. Additionally, in the context of the bifactor model, it is important to bring conceptual clarity to what the residual C's represent after controlling for shared variance with global PYD. Thus, revisiting and interrogating the conceptual meaning of the measurement models of the

Five C's advocated for in earlier 4-H studies, may be needed to enhance theoretical alignment between the factor structures being tested and the Five C's model of PYD.

Conclusions

PYD research approaches are important in redressing deficits-based research that has characterized studies of youth who are minoritized, including Latin American adolescents. However, an important step in utilizing PYD measures, like those based on Lerner and Lerner's (2005) Five C's of PYD, among minoritized populations is ensuring they are psychometrically sound. The current study sought to provide multiple sources of validity evidence by testing different factor structures of the PYD-SF (Geldhof et al., 2014a) and examining criterion validity with developmental outcomes (i.e., externalizing behaviors, internalizing behaviors, and academic achievement) within a Latin American adolescent sample. The findings showed that unlike prior studies with majority-White samples, the five-correlated factors model provided the best fit to these data after implementing certain modifications including dropping the items within the *values diversity* subscale of Character. Factor structures that included a global PYD factor either showed suboptimal model fit or did not converge. However, the C's were associated with Latin American youth's externalizing behaviors and academic achievement. The findings provide preliminary evidence for the use of the five-correlated factor structure within Latin American adolescent samples; however, future studies should investigate if the incorporation of sociocultural assets in tandem with the Five C's provide a more appropriate indexing of global PYD among Latin American youth.

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Data and code availability The data are not publicly available but may be requested from Melissa Y. Delgado. Code can be made available upon request.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Ethics Approval The questionnaire and methodology for this study was approved by the Institutional Review Board (IRB) of the Texas State University (IRB# 2014D2548).

Informed Consent Written informed consent was obtained from the parents and assent from the participating adolescents.

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