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Resilience in a Sample of Mexican American Adolescents with Substance Use Disorders

Jason J. Burrow-Sánchez, Carolina Corrales, Cynthia Ortiz Jensen, and Kimberly Meyers

Department of Educational Psychology, University of Utah

Abstract

Resolving the many tasks of adolescent development, in part, requires resilience. However, understanding the role that resilience plays in adolescent development involves adequate measurement of the construct. The Connor-Davidson Resilience Scale (CD-RISC) is a widely used measure of resilience but a stable latent factor structure has not been identified across studies. The measure has typically been examined in adult samples while little attention has been given to its use with adolescents in general and ethnic minority adolescents in particular. The primary purpose of the current study is to identify a latent factor structure of the CD-RISC in a sample of primarily Mexican American adolescents ($N = 106$). Two competing model structures were tested via confirmatory factor analysis and results supported a 7-item unidimensional factor model. Support was also found for the construct validity of the measure in relation to ethnic identity and depressive symptoms for adolescents in this sample. Implications of the study findings for adolescents and avenues of future research are discussed.

Keywords

Mexican American; adolescents; resilience; ethnic identity; confirmatory factor analysis

Adolescence is a period of growth when youth are faced with many challenging and stressful developmental tasks that require successful resolution (Erikson, 1997). Effectively resolving the many tasks of adolescent development, in part, require resilience; that is, an internalized schema that one has the ability to persist and overcome in the face of difficult circumstances. For ethnic minority youth, however, accomplishing the typical developmental tasks of adolescence also includes negotiating a sense of self as a member of a non-dominant group. These youth frequently face stressful situations such as racism and discrimination that can undermine their internalized sense of self and subsequent psychological adjustment (Umaña-Taylor & Updegraff, 2007). It is possible that resilience may buffer ethnic minorities' internalized sense of self and subsequently reduce the potential for negative psychological adjustment (Connor & Davidson, 2003; Umaña-Taylor & Updegraff, 2007). Unfortunately, the empirical study of resilience as a protective factor for ethnic minority adolescents is lacking.

In order to investigate the role that resilience may have on psychological outcomes the construct must be satisfactorily measured. A variety of instruments have been used to measure resilience (see Windle, Bennett, & Noyes, 2011); however, the most well used instrument is the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The CD-RISC was originally designed as a 25-item scale and validated on adult samples of primary care, psychiatric, and PTSD patients. An exploratory factor analysis conducted in the original validation study produced a five-factor structure for the CD-RISC. Since its development, the CD-RISC has been largely studied in domestic (Coats, Phares, & Dedrick, 2013; Lamond et al., 2009; Sexton, Byrd, & von Kluge, 2010) and international (Burns & Anstey, 2010; Karairmak, 2010) adult samples with only three studies focusing on adolescents (Gucciardi, Jackson, Coulter, & Mallett, 2011; Jorgensen & Seedat, 2008; Yu et al., 2011). The latent factor structure of the CD-RISC has varied considerably across studies with the majority identifying four or less factors. More recently, Campbell-Sills and Stein (2007) suggested a 10-item version of the measure that produces a unidimensional structure and has received attention in the research literature (Burns & Anstey, 2010; Gucciardi et al., 2011).

The CD-RISC has most extensively been investigated in adult samples with only three studies having been conducted with adolescents. In 2008, Jorgensen and colleagues administered the 25-item CD-RISC to a sample ($N=701$) of South African adolescents and identified a three-factor solution through exploratory factor analysis. More recently, Yu et al., (2011) administered a 25-item Chinese version of the measure to a large sample ($N=2,914$) of Chinese adolescents and indicated via confirmatory factor analysis that a five-factor solution best fit their data. Finally, Gucciardi et al., (2011) administered a 25-item version of the measure to a sample ($N=199$) of Australian adolescents and found support for a 10-item unidimensional structure of the measure. As noted from the review above, there is a dearth of literature on the CD-RISC with samples of U.S. adolescents in general, and ethnic minority adolescents in particular. At more than 51 million, Latinos make up the largest ethnic minority group in the U.S. with 2/3 being from Mexican descent and 1/3 under the age of 18 (Passel & D'Vera, 2008; Pew, 2011). These demographics, in addition to the lack of research on the measurement of resilience in ethnic minority adolescents, provide a pressing need for more work in this area.

The primary goal of the present study is to investigate the measurement of resilience in an ethnic minority sample of adolescents. This goal will be accomplished through examination of the factor structure for a measure of resilience, CD-RISC, via confirmatory factor analysis (CFA) in a sample of primarily Mexican American adolescents with substance use disorders. The secondary goal is to examine the construct validity of the CD-RISC by testing its predictive relation with theoretically relevant variables via path analysis. Resilience has been theoretically and empirically linked to internalizing behaviors in prior research (see Coats et al., 2013; Masten, 2004; Yu et al., 2011) and we include a measure of internal psychological distress (i.e., depressive symptoms) as an outcome variable in our path analysis. Ethnic minority adolescents must also grapple with their internalized level of identification with a non-dominant group (Phinney, 1990; Umaña-Taylor & Updegraff, 2007). We therefore hypothesize that the relation between resilience and psychological distress is mediated by ethnic identity for these youth.

Method

Sample Demographics and Recruitment

The sample was comprised of 106 adolescents who ranged in age from 13–18 ($M = 15.30$, $SD = 1.27$) and were recruited as part of a larger set of studies examining the cultural accommodation of substance abuse treatment for Latino adolescents (see Burrow-Sánchez & Wrona, 2012; Burrow-Sánchez, Martinez, Hops, & Wrona, 2011). All adolescents in this study identified as Latino and most were male (91.5%) and born in the U.S. (63.2%). The majority of adolescents were referred from probation officers or case managers working in the juvenile justice system within a medium-sized city in a Mountain West state of the U.S. and mandated to treatment at the time of referral. All adolescents met DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria for drug abuse or dependence. Participants were given the option of completing verbal interactions with study staff and measures in their preferred language (i.e., English or Spanish); 98% of adolescents preferred verbal interactions and measures in English. All of the participant procedures for this study were approved by the Institutional Review Board at the institution of the first author. The majority of adolescents in the sample had parents who were born in Mexico (73.6% of mothers; 81.1% of fathers) and reported annual household incomes of \$25,000 or less (72.6%).

Measures

All measures were administered in paper/pencil format at pre-determined time points as part of the larger study. Measures were between fifth- and seventh-grade reading levels and available from their respective sources in English and Spanish versions. Trained bilingual research assistants administered all measures to participants and remained present to answer any questions during the assessment. The focus of the current study is on the baseline assessment measures that were administered prior to adolescents being randomized to a treatment condition.

Connor-Davison Resilience Scale (CD-RISC)—Resilience was measured for all participants in this study using the 25-item version of the CD-RISC (Connor & Davidson, 2003). Items on the measure asked participants to indicate how much they agreed with statements related to their coping strategies and dealing with stressful life events through use of a 5-point scale from “0- Not True at All” to “4-True Nearly All the Time.” A total score was calculated for each participant (range = 0 to 100) with larger scores indicating higher levels of resilience. Jorgensen and Seedat (2008) reported an internal consistency of $\alpha = .93$ for an international sample of adolescents; internal consistency for the current study was $\alpha = .95$.

The Multi Ethnic Identity Measure (MEIM)—The MEIM is a widely used measure of ethnic identity for adolescents (Phinney, 1992). A modified 12-item version of the MEIM was used in this study that has been validated for this sample via confirmatory factor analysis (see Burrow-Sánchez, 2014). The items asked adolescent participants to indicate their attitudes and behaviors related to their ethnic identity group on a “1 – Disagree” to “5 – Agree” scale. Scores from the 12-items were summed and averaged for each participant with

a possible range of scores from 1 to 5 and higher scores indicating higher ethnic identity achievement. The MEIM has demonstrated high internal consistency for youth ($\alpha = .81$) and college student samples ($\alpha = .90$; Phinney, 1992). Internal consistency for the current sample was $\alpha = .90$.

Beck Depression Inventory-II (BDI)—The BDI is a widely used 21-item instrument that was administered to measure the level of depressive symptoms for adolescents. Items ask participants to rate their responses to statements evaluating symptoms of depression such as level of sadness, loss of pleasure, feelings of guilt, suicidal ideation, and somatic complaints. Individual item scores were summed to obtain a total score ranging from 0 to 63, with larger scores indicating higher levels of depressive symptoms. The BDI has been used extensively with adult (Beck & Steer, 1991) and adolescent samples (Steer, Kumar, Ranieri, & Beck, 1998). Internal consistency of this measure for the current sample was $\alpha = .87$.

Timeline Follow Back (TLFB)—Substance use for all participants was measured using the TLFB (Sobell & Sobell, 1992) which is a semi-structured interview that records substance use over a specified period of time. The TLFB utilizes a calendar format to help individuals remember their history and patterns of substance use. It has been used extensively with adolescents and appropriate psychometric properties have been established (Dennis, Funk, Godley, Godley, & Waldron, 2004; Sobell & Sobell, 2003). Alcohol and drug use data from the TLFB for 90 days prior to baseline was used for the present study.

Analytical Plan

The primary analysis consisted of testing two competing factor models of the CD-RISC via a confirmatory factor analysis (CFA) for the sample of adolescents in the present study. We tested two factor structure models that have been identified with international samples of adolescents (i.e., Gucciardi et al., 2011; Jorgensen & Seedat, 2008); were not able to locate any factor structure models that have been identified in domestic samples of adolescents. Secondary analysis included the use of path analysis to test the predictive relationship between the latent resilience factor(s) identified via the CFA and psychological distress as measured by the BDI; however, this relationship was tested via inclusion of ethnic identity as a mediator.

Results

Data Preparation

All descriptive and bivariate analyses were completed using IBM SPSS ver. 20 (IBM, 2011b) whereas CFA and Path Analysis was conducted with SPSS AMOS ver. 20 (IBM, 2011a). Screening indicated that less than 0.5% of the participant CD-RISC, MEIM and BDI data were missing; in order to utilize data from the entire sample and because the total amount of missing data was minimal it was replaced using the series mean procedure available in SPSS.

Confirmatory Factor Analysis

The two competing factor models tested via CFA were replicated from the three (25-items) and one factor (10-items) models identified by Jorgensen et al., (2008) and Gucciardi et al., (2011), respectively. The CFA models were compared based on the following fit criteria: (1) Chi-square over *df* ratio of less than 2, (2) Comparative fit index (CFI) higher than 0.95, (3) Normed fit index (NFI) closer to 0.95 and (4) Root mean square error of approximation (RMSEA) less than 0.08 (see Byrne, 2010). All models in the present study were analyzed using maximum likelihood (ML) estimation. This estimation procedure assumes the indicators of a measure are continuous variables and the indicators for the CD-RISC are categorical variables measured on a 5-point Likert-type scale. While it is a common to use ML estimation for categorical variables there is some disagreement about doing so in the literature (Breckler, 1990; Byrne, 2010). When using the AMOS software program one alternative approach for estimating categorical variables is the asymptotic distribution-free (ADF) method which is analogous to the weighted least squares method in other software programs (Byrne, 2010; Flora & Curran, 2004). Unfortunately, the ADF method was not feasible in the present study due to it requiring large samples sizes based on the number of estimated parameters in the model (Curran, West, & Finch, 1996). Fortunately, there is ample evidence to suggest that when the number of categories is four or more and the distribution does not markedly differ from normal the use of ML estimation for categorical variables does not pose problems (Bentler & Chou, 1987; Green, Akey, Fleming, Hershberger, & Marquis, 1997). For the current study, this estimation issue was addressed by comparing parameter estimates for the final model generated from both ML and Bayesian methods as suggested by Byrne (2010) for AMOS software. The comparison of parameter estimates for both methods indicated similarity but, more importantly, did not alter the substantive conclusions for the final model.

Models 1 and 2 were similar on the Chi-square over *df* ratio and RMSEA fit indices; however, Model 2 showed improved fit on the CFI and NFI indices (see Table 1). Model 2 was also more parsimonious compared to Model 1 and was thus chosen for further analysis. The second model was examined for potential misspecification through review of modification indices (covariances), regression weights and residual covariances; the review indicated that error terms covaried for items 6 and 7 and items 4 and 8 had the lowest regression weights and highest residual covariances (i.e., > 1). Based on the diagnostic review and visual inspection of the measure items 4, 7 and 8 were omitted from the model resulting in Model 3. Testing of Model 3 indicated a greatly improved fit over Model 2. Since Model 3 is nested within Model 2 the difference between their chi-square statistics provide a comparison of model fit to the data (Kline, 2005); that is, Model 2 – Model 3 = $83.400 - 19.178 = 64.222$ for 21 *df*, $p < .001$. In other words, Model 3 provided a significantly better fit to the data in this sample compared to Model 2. The unidimensional factor, titled HARDY, consisted of items 1, 6, 11, 14, 16, 17 and 19 and indicates how one copes with difficult circumstances. The average variance extracted and construct reliability for the HARDY factor was 50% and 0.87, respectively. Item content, latent factors and factor loadings for the models tested in this analysis can be found in Table 2. Bivariate correlations were computed for study variables and are presented in Table 3.

Path Analysis

To further assess the construct validity of Model 3 a path model was developed that tested the predictive relationship between the latent factor HARDY and depressive symptoms; however, we included the mediator ethnic identity in the path model based on our prior hypothesis of adolescent development for ethnic minorities. The path model indicated that HARDY had a significant positive direct effect on ethnic identity ($\beta = .285, p = .004$) and ethnic identity had a significant negative direct effect on depressive symptoms ($\beta = -.218, p = .021$). The total indirect effect of HARDY on depressive symptoms was significant and negative ($\beta = -.062, p = .010$). The path analysis provides support for our hypothesis that psychological distress is mediated by ethnic identity for ethnic minority adolescents.

Discussion

The purpose of the current study was to identify a latent factor structure for the CD-RISC in a sample of primarily Mexican American adolescents with substance use disorders. Results provided support for a unidimensional structure of the CD-RISC consistent with other research (Campbell-Sills & Stein, 2007; Gucciardi et al., 2011); however, the best fit was found for a 7-item measure rather than 10-items. In particular, item 7 exhibited content overlap with item 6 whereas items 4 and 8 demonstrated redundancy with other items on the measure; thus, these three items were omitted from the final model. Support for construct validity was also found for the unidimensional factor, HARDY, via its direct relationship with ethnic identity and indirect relationship with depressive symptoms. More importantly, the indirect relationship between HARDY and depressive symptoms provides support that resilience is mediated via ethnic identity for Latino adolescents.

Results from the present study provide support for the use of a 7-item measure of the CD-RISC with Mexican American adolescents with substance use disorders. More specifically, this instrument appears to measure a unidimensional factor of resilience that relates to one's ability to negotiate stressful situations. Resilience was positively related to ethnic identity for adolescents and appeared to buffer the effects of internalized psychological distress. These findings are consistent with prior research suggesting that adolescents with higher levels of ethnic identity experience less psychological distress (Umaña-Taylor & Updegraff, 2007). However, the empirical relation between resilience and ethnic identity for Mexican American adolescents is a new finding and sheds light on the developmental complexities experienced by this group.

Limitations of the present study include a restricted and small sample of adolescents. Specifically, this study included a sample of primarily Mexican American male adolescents with substance use disorders, thereby limiting generalizability to adolescents from other Latino subgroups (e.g., Puerto Rican, Cuban) and to females. However, it is important to note that participants referred by the juvenile justice system for adolescent substance abuse treatment studies are predominantly male (see Waldron & Turner, 2008). The sample size in this study is also considered small for confirmatory factor analysis, even though a latent factor structure was clearly identified. Fortunately, both of these limitations provide avenues for future research with larger and more generalizable samples of ethnic minority adolescents.

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Table 1

Fit Indices for Models Tested

Model ^a	Factors (Items)	χ^2	Df	χ^2/df	CFI	NFI	RMSEA	CI for RMSEA ^b
1	3 (25)	546.573	272	2.009	.826	.708	.098	.086 – .110
2	1(10)	83.400	35	2.383	.889	.827	.115	.083 – .147
3	1 (7)	19.178	14	1.370	.983	.943	.059	.000 – .119

Note.

^aModel 1 = Jorgensen et al., (2008), Model 2 = Gucciardi et al., (2011), Model 3 = Present Study; CFI = Comparative fit index; NFI = Normed fit index; RMSEA = Root mean square error of approximation.

^bCI for RMSEA = 90% Confidence Interval for Root mean square error of approximation.

Table 2

Item Content, Comparative Models and Factor Loadings

Item	Item Content	^a Model 1	Model 2	Model 3	Factor Loadings
1	I am able to adapt when changes occur.	<i>b</i> _{p2}	F1	Hardy	.555
2	I have at least one close and secure relationship that helps me when I am stressed.	F1	--	--	--
3	When there are no clear solutions to my problems, sometimes fate or God can help.	F3	--	--	--
4	I can deal with whatever comes my way.	F2	F1	--	--
5	Past successes give me confidence in dealing with new challenges and difficulties.	F2	--	--	--
6	I try to see the humorous side of things when I am faced with problems.	F2	F1	Hardy	.571
7	Having to cope with stress can make me stronger.	F2	F1	--	--
8	I tend to bounce back after illness, injury, or other hardships.	F2	F1	--	--
9	Good or bad, I believe that most things happen for a reason.	F3	--	--	--
10	I give my best effort no matter what the outcome may be.	F3	--	--	--
11	I believe I can achieve my goals, even if there are obstacles.	F1	F1	Hardy	.784
12	Even when things look hopeless, I don't give up.	F1	--	--	--
13	During times of stress/crisis, I know where to turn for help.	F1	--	--	--
14	Under pressure, I stay focused and think clearly.	F1	F1	Hardy	.822
15	I prefer to take the lead in solving problems rather than letting others make all the decisions.	F2	--	--	--
16	I am not easily discouraged by failure.	F2	F1	Hardy	.795
17	I think of myself as a strong person when dealing with life's challenges and difficulties.	F1	F1	Hardy	.816
18	I can make unpopular or difficult decisions that affect other people, if it is necessary.	F2	--	--	--
19	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	F2	F1	Hardy	.532
20	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	F2	--	--	--
21	I have a strong sense of purpose in life.	F1	--	--	--
22	I feel in control of my life.	F1	--	--	--
23	I like challenges.	F1	--	--	--
24	I work to attain my goals no matter what roadblocks I encounter along the way.	F1	--	--	--
25	I take pride in my achievements.	F1	--	--	--

Note.

^aModel 1 = Jorgensen et al., (2008). Model 2 = Gucciardi et al., (2011); Model 3 = Present Study

b F = Factor 1, 2 or 3; factor loadings are for current study.

Table 3

Bivariate Correlations Between Study Variables

Variable ^a	1	2	3	4	5	6	7
Age	1						
Sex	.009	1					
Grade	.884**	.001	1				
BDI	-.016	.298**	-.021	1			
Drug Use	.253**	.168	.224*	.161	1		
MEIM	.054	-.005	.102	-.218*	.028	1	
CD-RISC	.149	.075	.128	-.144	.020	.285**	1

* p < .05,
** p < .01;

^a BDI = Beck Depression Inventory, Drug Use = Percentage of Days Drugs Were Used in Past 90 (including alcohol, excluding tobacco) – scores were log transformed due to skew; MEIM = Multigroup Ethnic Identity Measure; CD-RISC = Connor-Davidson Resilience Scale (7-item version).