

Validation of the Children's Inventory of Anger (ChIA) with a Mexican sample

Julia Gallegos-Guajardo¹, Norma Ruvalcaba-Romero², Ania Chávez-Amavizca¹, Cecilia Martínez-Torteya¹, & W. M. Nelson III³

¹University of Monterrey, Mexico

²University of Guadalajara, Mexico

³Xavier University, United States of America

Abstract

The Children's Inventory of Anger (ChIA) is a self-report measure that assesses the level of anger experienced by children and youth. Anger is a significant predictor of aggression, peer relationships difficulties and antisocial behavior; therefore, is crucial to have a valid and reliable measure to evaluate it. The purpose of this study was to validate the ChIA for the Mexican children (ChIA-M). Participants were 638 students ($M = 9.8$ years; $SD = 1.51$), 49% were females from primary and secondary Mexican public schools. The exploratory factor analysis supported the four-factor structure with a shared variance of 47.60%, but a different distribution of items. The confirmatory factor analysis indicated the model to be an acceptable fit with the data $\chi^2(338) = 1089.75$, $p \leq .001$, $NFI = .82$; $IFI = .907$, $CFI = .906$, $RMSEA = .047$. Good internal consistency was obtained for Total score $\alpha = .94$ and subscales: Frustration $\alpha = .90$, Aggression $\alpha = .88$, Peer Relationships $\alpha = .76$ and Authority Relations $\alpha = .81$. Convergent and divergent validity was supported through positive and significant correlations with the Anger Inventory for Mexican Children and the negligible correlations with the Children Questionnaire of Positive Emotions. Results suggest that the Spanish version of the ChIA for Mexican population is a valid and reliable measure of child anger. However, attention should be paid to the cultural differences related to the experience of anger. Further research should continue evaluating the ChIA with clinical samples and children from different ages and regions in Mexico.

Keywords: scale; emotion; anger; children; factor structure.

Resumen

Validación del Cuestionario del Enojo para Niños (ChIA) con una muestra mexicana. El Cuestionario del Enojo para Niños (ChIA) es un instrumento de autoinforme que evalúa el nivel de enojo experimentado por niños y jóvenes. El enojo es un predictor de la agresión, los problemas con pares y el comportamiento antisocial; por lo tanto, es crucial tener un instrumento válido y fiable. El propósito de este estudio fue validar el ChIA para niños mexicanos (ChIA-M). Los participantes fueron 638 estudiantes ($M = 9.8$ años; $SD = 1.51$), 49 % eran mujeres de escuelas primarias y secundarias públicas mexicanas. El análisis factorial exploratorio apoyó la estructura de cuatro factores con una varianza compartida de 47.60 %, pero una distribución diferente de ítems. El análisis factorial confirmatorio indicó que el modelo ajusta aceptablemente $\chi^2(338) = 1089.75$, $p \leq .001$, $NFI = .82$; $IFI = .907$, $CFI = .906$, $RMSEA = .047$. Se obtuvo buena consistencia interna para Puntaje total $\alpha = .94$ y subescalas: Frustración $\alpha = .90$, Agresión $\alpha = .88$, Relaciones con pares $\alpha = .76$ y Relaciones con autoridad $\alpha = .81$. Obtuvo evidencias de validez convergente y divergente con correlaciones positivas y significativas con el Inventario de Ira para Niños Mexicanos y correlaciones insignificantes con el Cuestionario de Emociones Positivas para Niños. Los resultados sugieren que la versión en español del ChIA para población mexicana es un instrumento válido y fiable del enfado infantil. Sin embargo, se debe prestar atención a las diferencias culturales relacionadas con la experiencia de enojo. Se sugiere seguir investigando el ChIA con muestras clínicas y niños de diferentes edades y regiones de México.

Palabras clave: escala; emociones; enojo; niños; estructura factorial.

Anger refers to an emotional state that encompasses negative feelings, from minor annoyance to rage (Spielberg & Reheiser, 2009). Although it reflects a basic emotion with adaptive functions, difficulties with anger regulation result in frequent and intense inward and outward expressions of anger (Majeed & Malik, 2017). In the

long term, high levels of anger predict aggression throughout childhood and adolescence (Alcázar-Olán et al., 2012; Gómez-Garibello & Chaux, 2014; Majeed & Malik, 2017) and other externalizing psychopathology, such as conduct disorders and oppositional defiant disorder (Laceulle et al., 2014). High levels of anger are also associated with

Corresponding author:

Norma Ruvalcaba-Romero, Ph.D.

University of Guadalajara.

Sierra Mojada #950, Independencia Oriente, 44340, Guadalajara, Jal.

E.mail: norma.ruvalcaba@academicos.udg.mx

social difficulties (Strayer & Roberts, 2004), as well as lower levels of self-esteem and autonomy (Hussian & Sharma, 2014). Importantly, because anger is key to most theoretical models of aggression (Hubbard et al., 2010), assessment and early intervention efforts are essential to address staggering rates of bullying and aggression in schools.

Mexico, according to NGO Bullying Without Borders (2022), had the highest rates of bullying for the academic year 2021-2022, with 70% of students reporting experiencing some type of bullying every day. National statistics corroborate the significance of the problem: about 53% of children ages 10 to 17 reported experiencing violence in school (Child and Youth Survey; Instituto Nacional Electoral [INE], 2019). Community or gang related violence is also common in many geographical regions of the country, exacerbating exposure to acts of violence at an early age (Frías-Armenta et al., 2003; INE, 2019). Furthermore, school violence and aggression in Mexican schools have harmful long-term consequences for both victims and perpetrators; those children who are aggressive are at increased risk for behavior problems and oppositional defiant disorder (Albores-Gallo et al., 2011), while those who have been bullied are also more likely to experience internalizing and externalizing problems and report lower quality of life (Hidalgo-Rasmussen et al., 2018; Reijntjes et al., 2010).

Efforts to identify and address Mexican youth's anger difficulties, have significant potential to enhance the wellbeing of individuals and school communities (Martínez & Duque, 2008). However, the assessment of this construct is complex. First, multiple core elements have been proposed, including anger-induced momentary physical and emotional reactions, stable response tendencies, anger regulation, and the behavioral expression of anger (Smith et al., 2004). Second, children may be poor informants of their own subjective experience (Flanagan & Allen, 2005; Zhang et al., 2015). In addition, many instruments to assess anger that have been developed in other countries have not undergone extensive cultural validation.

Culturally Adapted Measures of Anger in Mexico

Despite the importance of identifying and addressing the needs of youth with difficulties regulating anger, only a handful of measures have been developed or adapted for use with Mexican populations. The *Inventory for Measuring Anger (Inventario para la Medición de la Ira, IMI; Alcázar-Olán et al., 2012)* is a 43-item self-report questionnaire that evaluates state anger, trait anger (temperament), anger-out (expression of anger), and anger control. This instrument was developed in Mexico and has adequate internal consistency ($\alpha = .75$ to $.90$) and validity (Alcázar-Olán et al., 2012), but has not been used in additional published studies, limiting its usefulness. A more widely used measure with international applications is the *Multicultural Latin American Inventory of Anger Expression and Hostility (ML-STAXI; Alcázar et al., 2011)*, a cultural adaptation of the *State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999)*. This 44-item questionnaire yields scores for state-anger, trait-anger, inward anger expression, outward anger expression, and suppression. In two Mexican validation studies, state- and trait-anger subscales demonstrated satisfactory internal consistency ($\alpha = .86$ and $.77$). However, statistical analyses yielded different factor structures in each sample, with nine (for college students) and seven (for middle school students) subscales (Alcázar et al., 2011; Alcázar et al., 2016). In addition, the samples included adolescents and college students only; as such, measures that can be used with younger children are yet to be established.

Children's Inventory of Anger

The *Children's Inventory of Anger (ChIA)*, a self-report instrument

for children 6 to 16 years old, was developed in the United States to address the need for assessing young children's subjective experience of anger. The ChIA (Nelson & Finch, 2000) is a 39-item self-report questionnaire that evaluates the intensity of anger in response to a variety of situations using pictorial representations to complement verbal response options. The ChIA is an adaptation of a longer version (Nelson & Finch, 1978), based on Novaco's (1978) conceptualization of anger as an intense emotional response to frustration or provocation that is characterized by physiological and cognitive reactions (Flanagan & Allen, 2005). Each item is rated using a verbal and pictorial (i.e., facial expression) four-point Likert scale, from "I don't care" to "I am furious". Items yield an Inconsistent Responding Validity Index, as well as four subscales: Frustration (e.g., "Your mom won't buy your favorite cereal"), Physical Aggression (e.g., "Somebody punches you"), Peer Relationships (e.g., "You ask for something and your sibling says no"), and Authority Relations (e.g., "Parent yells at you in public"). Raw scores are used to derive age-stratified standard scores, based on a national U.S. sample of 1,604 youngsters ($M = 10.80$ years, $SD = 3.1$ years). Participants in this sample were from grades 1 through 11, attending rural and urban public-schools; youth represented the U.S. racial/ethnic characteristics at the time of validation: 63% identified as White, 8% Black, 6% Hispanic, 3% Asian, and 3% "Other" (Nelson & Finch, 2000).

In its initial validation (Nelson & Finch, 2000), the ChIA demonstrated good psychometric properties with both the full sample and a subsample of young children (6 to 7-year-olds), showing very good to excellent internal consistency for the total score in ($\alpha = .95$), and the four subscales ($\alpha = .85$ to $.87$). Test-retest reliability after a one-week interval was good for the full sample ($r = .75$), and adequate for the younger sample ($r = .66$). Although, stability for the subscales was lower ($r = .65$ to $.75$ for the full sample and $r = .48$ to $.73$ for the younger children), Flanagan and Allen (2005) posit low test-retest correlations are to be expected, and reflect anger's transitory and dynamic nature. Convergent validity was established through small to moderate correlations with measures of anger, aggression, and attitudes towards violence, while divergent validity was established through negligible correlations with the *Piers-Harris Children's Self-Concept Scale (PHCSCS; Piers & Harris, 1996)*, suggesting the ChIA selectively measures the experience of anger, rather than overall poor psychological adjustment (Nelson & Finch, 2000).

The ChIA has been used in different contexts and populations within the United States including community samples, clinical samples, and ethnic minority youth (Brown et al., 2008; Sofronoff et al., 2007), but not with Spanish speaking children. Because cultural norms are intrinsically linked to the appropriateness of anger expression (González-Prendes, 2014), cultural adaptation and validation of this measure with Mexican youth is imperative for its use in research and practice.

The current study

The study is the first to culturally adapt and validate the ChIA with a sample of children and adolescents (9 to 12 years old) from Mexico. Specifically, we translated and then evaluated the factor structure of the measure in Spanish, the internal consistency of the total scale and the subscales, and provided evidences of convergent and divergent validity. We hypothesized that the measure will maintain its original factor structure with the Mexican sample, and will show good reliability and validity indices. Establishing the ChIA as a culturally appropriate tool that also facilitates cross-cultural comparisons can aid efforts to address the rising levels of aggressive behaviors and mental health problems in Mexican schools (INE, 2019; Murrieta et al., 2014; Ali et al., 2016).

Method

Participants

This study used a convenience sample and as inclusion criteria elementary school students aged 9 to 12 years ($M = 9.8$ years; $SD = 1.51$) attending public schools located in the cities of Guadalajara (2 schools, 32% of the student sample) and Monterrey (6 schools, 68% of the student sample) in Mexico. In addition, each of the participants had informed consents and assents from their parents. A total of 638 participants were included in this study.

Students were excluded if they did not agree to participate, did not have signed informed consent, were under 9 years of age, and/or had difficulties in reading and writing that did not allow them to complete the instrument. The final sample were 51% male and attending 3rd (23%), 4th (24%), 5th (22%), 6th (20%), and 7th grade (11%).

Instruments

1. *Inventory for Measuring Anger* (IMI; *Inventario para la Medición de la Ira*; Alcázar-Olán et al., 2012). The IMI is a 30-item measure developed to evaluate the emotional responses associated with anger among Mexican children. Youth rate items (e.g., “I get angry easily,” “I hit to the one that made me angry”) in a 3-point Likert scale. The measure has four subscales: state anger, trait anger (temperament), anger-out (expression of anger), and anger control. The IMI has adequate internal consistency and concurrent validity is shown through correlations between aggressive behaviors (Anger Index; Mendoza et al., 1997) and state anger ($r = 0.18, p < .05$), trait anger ($r = 0.35, p < .001$), anger-out ($r = 0.58, p < .001$), and anger control ($r = -.20, p < .05$) (Alcázar-Olán et al., 2012). For the purpose of this study, the subscales of trait anger ($\alpha = .73$, with the current sample) and expression of anger ($\alpha = .50$, with the current sample) were used based in conceptually meaningful associations with the construct measured by the ChIA.

1. *Children Questionnaire of Positive Emotions* (CIEP; *Cuestionario Infantil de Emociones Positivas*; Oros, 2014). This measure evaluates the experience of positive emotions in children 8 to 12 years old. Respondents rate items (e.g., “I enjoy very much the things I do”) in a 3-point Likert scale. In its original version, this measure is comprised of 23 items and dimensions of Happiness, Gratitude, Serenity, Sympathy, and Personal Satisfaction. For the purpose of this study, only the 5-item Happiness subscale was included ($\alpha = .75$ with the current sample).
2. *Children's Inventory of Anger* (ChIA; Nelson & Finch, 2000). The ChIA is a 39-item, Likert-type format with pictorial representations, evaluating anger in children and youth ages 6 to 16 years old. It takes approximately 10 to 15 minutes to complete. The items are added to calculate a total score and four subscale scores: Frustration, Physical Aggression, Peer Relationships, and Authority Relations, as well as an Inconsistency Responding Index. As previously indicated, the ChIA has demonstrated good psychometric properties (Nelson & Finch, 2000).
3. *Demographics questionnaire*. Participants completed questions related to gender, age, school grade and city of residence.

Procedure

For the purpose of this cross-sectional study with a convenience sample of local public school students from the cities of Monterrey and Guadalajara in Mexico, the ChIA was translated from English to

Spanish by two Ph.D. level Psychology Professors at two Universities in Mexico. Within the translation process, language was adapted and cultural aspects were revised in order to make the items more understandable to the Mexican population. Then, in order to ensure that the translation did not change the original meaning of the items in the measure, an independent bilingual translator translated the Spanish version again into English. Our procedures followed the translation requirements suggested by the publishing company of the original ChIA (Western Psychological Services, 2022).

Principal researchers obtained permission from the principal at each school for all procedures of the study. The measures were administered in a group setting in each classroom and administered by undergraduate psychology students within a two-week period. To ensure confidentiality, no identifying information was collected. Participation was completely voluntary and there was no compensation.

Statistical analysis

The sample was randomly divided, considering the same proportion of boys and girls from both cities. With the first part ($N = 300$) the exploratory factorial analysis was carried out and with the second part of the sample ($N = 338$) the confirmatory factor analysis was carried out.

First, the Kaiser-Meyer-Olkin index and the Bartlett sphericity test were computed to determine whether the data were apt for conducting factor analyses. EFA ($N = 300$) was conducted with Principal Components Analysis and Varimax rotation using SPSS v.25. Eigenvalues (>1) were used to select the number of factors to be retained. Internal reliability was calculated using Cronbach's alpha.

Confirmatory factor analysis using AMOS v.19 was conducted with a randomly selected half of the sample ($N = 338$). Last, Cronbach's alpha internal consistency, and Pearson correlations with indices of anger and positive emotions were examined to establish the psychometric properties of the adapted measure with the full sample.

Results

Factor Analyses

Results showed that the data were appropriate for conducting an Exploratory Factor Analysis, according to the Kaiser-Meyer-Olkin index (.94) and the Bartlett sphericity test ($\chi^2_{(300)} = 5227.89, p < .001$). The EFA replicated the four-factor structure of the original model and the factors explained 15.72%, 14.77%, 9.36%, and 8.93% of the variance, respectively. The results obtained are reported in Table 1, which also includes the correlations between individual items and factors, as well as the internal reliability analysis if the item is removed.

Twenty-four items loaded onto the same factor as the original English version (items 4, 5, 6, 8, 10, 11, 12, 14, 15, 16, 19, 21, 22, 23, 24, 26, 27, 28, 29, 31, 35, 36, 37, and 38). Thirteen items were relocated to a different factor based on item loadings and conceptual fit (Table 2). Last, items 2 (“Your bike has a flat tire”) and 25 (“Someone cuts in front of you in line”) did not load significantly into their original factor or a conceptually relevant factor. Therefore, they were removed from the final adapted Spanish version of the ChIA. All 37 retained items demonstrated significant correlations with their subscale.

Aggression involved twelve items that alluded to both physical and verbal aggression (items 9, 10, 11, 12, 13, 22, 23, 24, 30, 35, 36 and 37); Frustration involved twelve items (items 14, 15, 17, 20, 26, 27, 28, 32, 33, 34, 38 and 39); Peer Relationships involved five items (items 3, 8, 18, 19 and 21); and Authority Relations involved eight items (items 1, 4, 5, 6, 7, 16, 29 and 31).

Table 1. Exploratory Factor Analysis of the Spanish version of the ChiA for Mexican population

item	Factor I: AGRE	Factor II: FRUST	Factor III AUTH	Factor IV: PEER	M	SD	Correlation scale - item	Cronbach's alpha if the item is deleted
Item 11	.689				3.27	0.93	.60	.87
Item 37	.666				3.01	0.97	.59	.87
Item 36	.653				3.14	1.00	.64	.87
Item 13	.650				2.93	1.07	.61	.87
Item 23	.625				3.13	0.96	.63	.87
Item 10	.615				2.81	0.99	.57	.88
Item 35	.605				2.90	1.07	.68	.87
Item 09	.552				3.00	1.04	.56	.88
Item 30	.528				2.58	1.01	.58	.87
Item 24	.506				2.70	1.04	.57	.87
Item 12	.491				3.04	1.09	.45	.88
Item 22	.436				2.63	1.09	.53	.88
Item 25	.414				2.58	1.06		
Item 39		.702			2.08	1.15	.62	.89
Item 38		.633			2.32	1.16	.68	.89
Item 26		.633			2.10	0.98	.69	.89
Item 27		.606			1.93	0.98	.61	.89
Item 28		.595			2.07	1.12	.67	.89
Item 34		.592			2.27	1.19	.57	.89
Item 33		.530			2.12	1.09	.61	.89
Item 32		.515			2.30	1.12	.60	.89
Item 14		.484			2.00	0.94	.57	.89
Item 15		.450			2.64	1.07	.59	.89
Item 17		.429			2.47	1.06	.57	.89
Item 20		.416			2.52	1.04	.59	.89
Item 04			.708		2.10	1.08	.61	.78
Item 06			.651		2.44	1.04	.56	.79
Item 01			.574		1.70	0.96	.56	.79
Item 07			.560		2.07	1.14	.48	.80
Item 31			.534		2.19	1.17	.54	.79
Item 16			.532		1.98	1.14	.45	.80
Item 05			.415		2.44	1.14	.47	.80
Item 29			.410		2.36	1.03	.57	.78
Item 03				.627	2.43	1.08	.56	.71
Item 19				.532	2.35	1.05	.58	.71
Item 02				.526	2.18	1.04		
Item 18				.514	2.46	1.11	.55	.71
Item 21				.509	2.08	0.99	.44	.74
Item 08				.438	2.69	1.01	.47	.73
Cronbach's alpha	0.88	0.90	0.81	0.76				
% Variance explained	15.72	14.77	9.37	8.94				

Note: FRUST = Frustration, AGRE=Aggression, PEER= Peers Relationships, and AUTH=Authority Relations.

With the second sample, the Confirmatory Factor Analysis was carried out ($N=338$). The results are reported in Figure 1. The model was found to be an acceptable fit for the data, $\chi^2_{(338)} = 1089.75$, $p < .001$, NFI = .81; IFI = .90, CFI = .90, RMSEA = .04 (Bentler, 1990; Klein, 2005; Awang, 2015).

Reliability

Cronbach's alpha internal consistency for the Mexican version of the ChIA was good to excellent with $\alpha = .94$ for the Total score, $\alpha = .90$ for the Frustration subscale, $\alpha = .88$ for the Aggression subscale, $\alpha = .76$ for the Peer Relationships subscale, and $\alpha = .81$ for the Authority Relations subscale.

Validity

All four subscales of the Mexican version of the ChIA showed moderate correlations with the trait anger and anger out subscales of the IMI, providing evidences of convergent validity. Last, statistically significant negative correlations were observed between the four subscales of the ChIA and happiness, providing evidences of divergent validity. The results are reported in Table 3.

Discussion

The primary purpose of this study was to adapt and validate the Children's Inventory of Anger (ChIA; Nelson & Finch, 2000) for use in Spanish with Mexican children and adolescents. The obtained data

Table 2. Item relocation in the Spanish version of the ChIA

Item	Original version	Spanish version
1. Parent calls you in the middle of your TV show.	FRUST	AUTH
3. Your sibling or peer ignores you.	FRUST	PEER
7. The teacher’s favorite student does all the fun things.	PEER	AUTH
9. Someone bumps your desk on purpose and you mess up your work.	PEER	AGRE
13. Somebody calls you a “chicken”.	FRUST	AGRE
17. Someone tell you are not old enough.	AUTH	FRUST
18. You are watching a TV show and someone change the channel.	AUTH	PEER
20. Your friends are playing a game and they won’t let you play.	PEER	FRUST
30. Parent yells at you in public.	AUTH	AGRE
32. You do something special for a friend but you are not been reciprocated.	PEER	FRUST
33. You were picked last on a team.	PEER	FRUST
34. During Christmas your friends received what they wished for but you do not.	PEER	FRUST
39. You have to go to bed earlier than your friends.	AUTH	FRUST

Note: The items in the table have been reworded with the purpose of providing a general idea of the meaning of the original item. FRUST = Frustration, PHYS= Physical Aggression, AGR=Aggression, PEER= Peer Relationships, and AUTH=Authority Relations.

Figure 1. Confirmatory Factor Analysis (CFA) of the Spanish version of ChIA

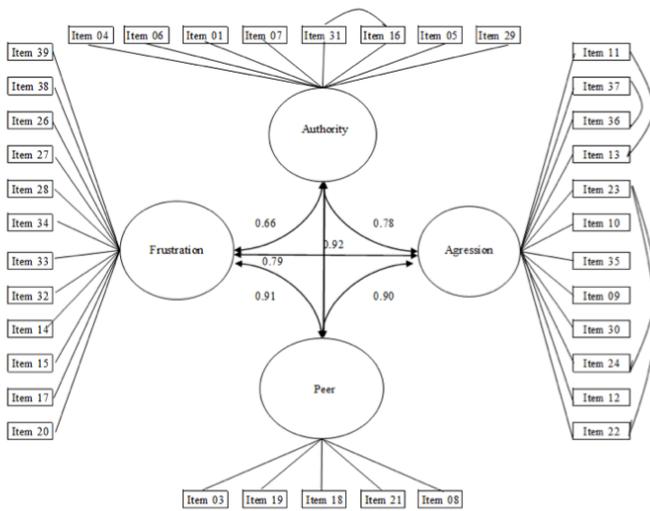


Table 3. Correlations between the Spanish version of ChIA and convergent and divergent measures

	ChIA FRUST	ChIA AGRE	ChIA PEER	ChIA AUTH	IMI TA	IMI AO	CPE HAP
ChIA FRUST	--						
ChIA AGRE	.70**	--					
ChIA PEER	.71**	.63**	--				
ChIA AUTH	.69**	.60**	.57**	--			
IMI TA	.36**	.27**	.32**	.41**	--		
IMI AO	.34**	.30**	.28**	.32**	.44**	--	
CPE HAP	-.33**	-.23**	-.25**	-.34**	-.38**	-.26**	--

Note: ** $p < .01$. Abbreviations: FRUST = Frustration, PHYS= Physical Aggression, AGRE=Aggression, PEER= Peer Relationships, and AUTH=Authority Relations, IMI TA= IMI Trait anger subscale, IMI AO= IMI Anger out subscale, CPE HAP=CPE Happiness subscale.

provide promising evidence that this Spanish version of ChIA is a psychometrically sound measure of self-reported anger in youth. More

specifically, factor analytic results were similar to Nelson and Finch’s (2000) original English version, which includes four subscales: Frustration, Physical Aggression, Peer Relationships, and Authority Relations. The Spanish version has good internal consistency and convergent and divergent validity are supported through correlations with indices of anger and happiness. These findings are generally consistent with those reported in the standardization study (Nelson & Finch, 2000), suggesting that the Spanish version of the ChIA is a useful instrument to assess anger among Mexican children and adolescents.

The four-factor structure of the ChIA (Nelson & Finch, 2000) was replicated with our sample of Mexican youth, and the four factors explained a similar amount of variance than in the original standardization sample (47.65% and 45%, respectively). However, some changes are suggested by our analyses: Two items from the original version were deleted, as they demonstrated low factorial loadings with the original subscale and they factored in a different subscale: items 2 (“Your bike has a flat tire”) and 25 (“Someone cuts in front of you in line”).

In our adapted version of the ChIA, the factors of Agresion and Frustration shared the largest number of items, both explaining a variance of 30.49%. In contrast, in the original standardization sample, the Peer Relationships factor had the highest variance explained (33%; Nelson & Finch, 2000). It is also worth noting that, of the 13 items that were relocated, four items that were originally a part of the Peer Relationships factor were relocated to the factor of Frustration because of high factor loadings and because the content of the items could also conceptually map on to the construct of Frustration (item 20– “Your friends are playing a game and they won’t let you play”; item 32 – “You do something special for a friend and he or she does not do anything for you”; item 33 – “Your friends pick you last to be on a team”; item 34 – “Your friend gets what he or she wanted for Christmas, but you don’t”).

The significant overlap between items that involve interactions with peers and the notion of frustration may be related to differences reported between Mexican and American students in their levels of individualism-collectivism (Shkodriani & Gibbons, 1995). On the one hand, it may be that when Mexican children get frustrated during an unfair interaction with a peer they posit “blame” inwards, protecting feelings of group belonging. On the other hand, for American children, it may be possible that when conflict arises due to been unjustly treated, the strong value placed in personal goals informs their understanding of the situation, placing blame in the peer and reacting with more assertive or confrontational behavior.

The cultural value of “respect” (“*respeto*”) or deferring to authority figures, which is characteristic of Latino culture (Reyes & Elias, 2011), may have also influenced the composition of the Authority Relations subscale. In the adapted version the subscale had eight items, and two of these were incorporated to this subscale because of high factor loadings and as they involve interactions with older high-status individuals (item 1 – “Your mother calls you to dinner in the middle of your favorite TV show” and item 7 – “The teacher’s pet gets to do all the fun jobs in class”). These items were part of the Frustration and Peer Relationships factors in the US standardization sample, but were more consistent with reactions to authority figures with the Mexican sample, because in both of these scenarios the students felt like they had to obey or had little recourse to address the unfairness.

There were also some changes in the two additional subscales. In regard to Aggression, in this adapted version the subscale contained aspects of both physical and verbal aggression, while the original version only focused on physical aggression. That is, items 13 (“Somebody calls you a ‘chicken’”) and 30 (“Your dad yells at you in front of other people”) were found to load into the Aggression factor in the current study and not in the factor of the original US study (Nelson & Finch, 2000), because both refer to aggression or provocation by another person. The 6-item Peer Relationship factor of the adapted ChIA included four items that did not originally pertain to it (item 3 – “Your brother or sister or friend ignores you”; item 8 – “In a game, someone on the other side tries to cheat”; item 18 – “Someone turns the TV to another channel when you are watching a show”; item 19 – “Your brother or sister says ‘No’ when you ask for something”; and item 21 – “Somebody says ‘I told you so’ after something goes wrong”). Similar to the original US study (Nelson & Finch, 2000), internal consistency for the Mexican version of the ChIA was good to excellent for the total score and all four subscales.

In regard to the convergent and divergent validity, the results of the present study, as expected, exhibited statistically significant positive correlations between the four sub-scales of the ChIA and the two sub-scales of the IMI (Alcázar-Olán, et al., 2012). These findings coincide with the results of Nelson and Finch (2000) with the original standardization sample. In regard to divergent validity, the negligible correlations between the ChIA and the Happiness subscale indicated that the ChIA appears to be selective in measuring the experience of anger in particular, rather than measuring general wellbeing, and supporting that the two measures are related to different constructs. Similar results were found between the original ChIA and the Piers-Harris Children’s Self-Concept Scale (Nelson & Finch, 2000).

Limitations and Future Directions

There are several noteworthy limitations of this study. First, although we completed a careful back-to-back translation process to meet the requirements of the ChIA publishing company, but the adaptation process was not as comprehensive as others have recommended (World Health Organization, 2016). Additional studies are recommended to confirm the factor structure of the Spanish version of the ChIA for Mexican youth, as well as the validity and reliability of the measure with youth from different geographical regions and socioeconomic levels. Second, the Spanish version of the ChIA was administered only to community “healthy” children in elementary public schools. Further research is needed in clinical samples of children with mental health problems or high levels of aggression to confirm the results obtained in this study and should also include test-retest as part of their analyses.

Our results also show that, even with careful translation, there may be subtle changes to the psychometric structure of the measure (i.e., changes in factor structure and item relocation). Furthermore, the subsequent interpretation of the scores on each subscale may be different than those originally suggested by the developers of the measure; for example, in the Mexican adaptation the Aggression subscale encompasses both physical and verbal attacks. The findings of this study and subsequent clinical implications might also further sensitize researchers and clinicians in the United States to the possible cultural differences related to the experience of anger and its assessment among Mexican American youth and encourage the adaptation of the measure this minority group in the United States.

Besides continuing research to further establish traditional psychometric properties (i.e., reliability, validity) of the Spanish version of ChIA, it is imperative for clinicians to better appreciate the essential link between assessment and therapy in working with clients. Assessment is essential because it informs the base for clinicians’ treatment plans, the interventions selected, and the benchmarks by which therapy is judged to be successful or not. The “gold standard” for clinicians working with children and their families is to conduct a multi-method, multi-informant, multi-setting, multi-occasion assessment evaluation. The “collaborative problem-solving model” has been suggested as a way for clinicians to best conceptualize the assessment process and how to initially gather the data to facilitate treatment over the course of therapy (Finch et al., 2012). While this study presents additional reliability and validity data regarding the ChIA for a Mexican population, it is equally important to consider the clinical utility of all assessments in providing clear description of the presenting problem, setting clearly defined goals for treatment, and using these goals in the process of establishing a baseline to measure progress over the course of therapy. With anger management interventions, it is important for clinicians to recognize the difference between “anger” and “aggression”. “Anger” is the internal experience of a private, subjective event (i.e., emotion) that has cognitive (e.g., thoughts, self-statements, private speech, images, attributions) and physiological components. “Aggression” involves behavioral acts that include bodily, social, and/or psychological harm to others. This distinction is especially important in cognitive-behavioral treatments for youngsters with anger problems (e.g., Nelson et al., 2015a, b), where clinicians focus on teaching children to better manage their anger, which often mediates how the actually behave in dealing with anger-arousing situations.

The results of the current study suggest that the Spanish version of the ChIA for Mexican population is a reliable and valid measure of anger, and may be used to identify such problems at an early stage. Given the dearth of measures evaluating the *subjective* experience of anger in children, the ChIA holds promise in not only adding to the initial assessment of externalized emotional/behavioral difficulties experienced by children and the problematic triggers for aggressive acting out, but also how to facilitate and measure treatment efficacy over the course of treatment.

Acknowledgments

Our sincere thanks to the support provided by the school principals for facilitating the research, and to psychologist Carmen Lizeth Sánchez Díaz for her support in reviewing the article.

Author Contribution Statement

J.G.G., N.R.R. and W.M.N. contributed to the design of the study. J.G.G. and N.R.R. contributed with the data collection. N.R.R. per-

formed the statistical analyses. J.G.G., N.R.R., A.C.A., C.M.T. and W.M.N. contributed to the writing of the manuscript. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Compliance with Ethical Standards

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

References

- Albores-Gallo, L., Saucedo-García, J., Ruiz-Velasco, S., & Roque-Santiago, E. (2011). El acoso escolar (bullying) y su asociación con trastornos psiquiátricos en una muestra de escolares en México [Bullying and its association with psychiatric disorders in a sample of schoolchildren in Mexico]. *Salud Pública de México*, 53(3), 220-227. https://www.scielosp.org/article/ssm/content/raw/?resource_ssm_path=/media/assets/spm/v53n3/a06v53n3.pdf
- Alcázar-Olán, R. J., Deffenbacher, J. L., & Byrne, Z. S. (2011). Assessing the factor structure of the Anger Expression Inventory (ML-STAXI) in a Mexican Sample. *International Journal of Psychology and Psychological Therapy*, 11(2), 307-318. <http://repositorio.iberopuebla.mx/bitstream/handle/20.500.11777/979/Assessing%20ML%20STAXI%20Factor%20Structure%20in%20Mexican%20Sample%20Alcazar%20Deffenbacher%20Byrne%202011.pdf?sequence=1&isAllowed=y>
- Alcázar-Olán, R. J., Deffenbacher, J. L., & Escamilla-Tecalco, H. (2016). Developing a valid version of an Inventory to Measure Anger in Mexican Adolescents of middle school level. *Youth & Society*, 48(1), 126-143. <https://doi.org/10.1177/0044118X13483775>
- Alcázar-Olán, R. J., Deffenbacher, J.L., Reyes-Pérez, V., & Pool Cibrián, W. J. (2012). Developing an inventory to measure anger in Mexican children. *Revista Colombiana de Psicología*, 21(2), 303-313. <http://www.scielo.org.co/pdf/rcps/v21n2/v21n2a08.pdf>
- Ali, G. C., Ryan, G., & De Silva, M. J. (2016). Validated screening tools for common mental disorders in low and middle income countries: a systematic review. *PloS one*, 11(6), 1-14. <https://doi.org/10.1371/journal.pone.0156939>
- Awang, Z. (2015). Validating the measurement model: CFA in Awang, Z. *SEM Made Simple: A gentle approach to learning Structural Equation Modelling*. MPWS Rich Publication.
- Bentler, P.M. (1990) Comparative Fit Indexes in Structural Models. *Psychological Bulletin*, 107 (2), 238-46.
- Brown, E. J., Amaya-Jackson, L., Cohen, J., Handel, S., Bocanegra, H. T. D., Zatta, E., Gooman, R.F., & Mannarino, A. (2008). Childhood traumatic grief: A multi-site empirical examination of the construct and its correlates. *Death Studies*, 32(10), 899-923. <https://doi.org/10.1080/07481180802440209>
- Flanagan, R. & Allen, K. (2005). A review of the Children's Inventory of Anger (ChIA): A needed measure. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 23(3), 263-273. <https://doi.org/10.1007/s10942-005-0010-1>
- Frías-Armenta, M., López-Escobar, A. E., & Díaz-Méndez, S. G. (2003). Predictores de la conducta antisocial juvenil: Un modelo ecológico [Predictors of youth antisocial behavior: An ecological model]. *Estudios de Psicología*, 8(1), 15-24. <http://dx.doi.org/10.1590/S1413-294X2003000100003>
- Finch, A.J., Jr., Lochman, J.E., Nelson, W.M.III, & Roberts, M.C. (2012). *Specialty competencies in clinical children and adolescent psychology*. Oxford University Press.
- González-Prendes A. A. (2014). Anger. In S. J. Morewitz & M.L. Goldstein (Eds) *Handbook of Forensic Sociology and Psychology* (pp. 345-362) Springer. https://springerlink.udemproxy.elogim.com/chapter/10.1007/978-1-4614-7178-3_24
- Hidalgo-Rasmussen, C. A., Ramírez-López, G., Rajmil, L., Skalicky, A., & Hidalgo- Martín, A. (2018). Bullying and health-related quality of life in children and adolescent Mexican students. *Ciencia & Saúde Coletiva*, 23, 2433-2441. <https://doi.org/10.1590/1413-81232018237.16392016>
- Hussian, A., & Sharma, S. (2014). Anger expression and mental health of bully perpetrators. *FWU Journal of Social Sciences*, 8(1), 17-23. http://sbbwu.edu.pk/journal/FWU_Journal_Summer2014,Vol.8,No.1/3_Anger_expression_and_mental_health_of_bully_perpetrators_04-06-14.pdf
- Kline, R. B. (2005). *Principles and practice of Structural Equation Modelling*. Kline, New York: The Guilford Press.
- Instituto Nacional Electoral (INE; 2019). *Consulta Infantil y Juvenil 2018. Reporte de resultados*. INE.
- Laceulle, O. M., Ormel, J., Vollebergh, W. A. M., Van Aken, M. A. G., & Nederhof, E. (2014). A test of the vulnerability model: Temperament and temperament change as predictors of future mental disorders—the TRAILS study. *The Journal of Child Psychology and Psychiatry*, 55(3), 227-236. <https://doi.org/10.1111/jcpp.12141>
- Majeed, S., & Malik, F. (2017). Anger experience, expression and control in children with emotional-behavioral problems in comparison with normal children. *Journal of Pakistan Psychiatric Society*, 14(1), 32-36. <https://udemproxy.elogim.com/auth-meta/login.php?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip&db=asn&AN=123823046&lang=es&site=eds-live&scope=site>
- Martínez, J., & Duque, A. (2008). El comportamiento agresivo y algunas características a modificar en los niños y niñas [Aggressive behavior and some characteristics to be modified in boys and girls]. *Investigaciones Andina*, 16(10), 92-105. https://digitk.areandina.edu.co/bitstream/handle/areandina/224/El_comportamiento_agresivo_y_algunas_caracteristicas_a_modificar....pdf?sequence=2
- Mendoza, B., Ortiz, A., & Ayala, H. (1997). Índice de enojo infantil [Anger index for children]. Unpublished manuscript, Universidad Nacional Autónoma de México.
- Murrieta, P., Ruvalcaba, N. A., Caballo, V., & Lorenzo, M. (2014). Cambios en la percepción de la violencia y el comportamiento agresivo entre niños a partir de un programa de habilidades socioemocionales. *Psicología Conductual*, 22(3), 569-584. <https://udemproxy.elogim.com/auth-meta/login.php?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip&db=edsgea&AN=edsgecl.520713138&lang=es&site=eds-live&scope=site>
- Nelson, W. M. & Finch, A. J. (2000). *Children's Inventory of Anger Manual*. Western Psychological Services.
- Nelson, W. M. & Finch, A. J. (1978). *Nelson-Finch Children's Inventory of Anger manual*. Unpublished manuscript. Xavier University.
- Nelson, W.M., III, Finch, A.J., Jr., & Gallegos-Guajardo, J. (2015a). *Cuaderno de Trabajo en el Manejo del Enojo "Manten la Calma"* (Segunda Edición). Workbook Publishing.

- Nelson, W.M., III, Finch, A.J., Jr., & Gallegos-Guajardo, J. (2015b). *Terapia Cognitivo –Conductual para Niños Agresivos: Manual del Terapeuta para el Cuaderno de Trabajo “Manten la Calma”* (Segunda Edición). Workbook Publishing. NGO International Bullying Without Borders (March 26, 2022). *Bullying. MÉXICO. Estadísticas de Acoso Escolar 2020/2021*. 180.000 CASOS.: <https://bullyingsinfronteras.blogspot.com/2017/03/bullying-mexico-estadisticas-2017.html>
- Novaco, R.W. (1978). Anger and coping with stress. In J.P. Forety & D.P. Rathken (Eds.), *Cognitive behavior therapy: Research and application* (pp. 135-178). Plenum Press.
- Oros, L. (2014). Nuevo Cuestionario de Emociones Positivas para Niños [New Positive Emotions Questionnaire for Children]. *Anales de Psicología*, 30(2), 522-529. <https://doi.org/10.6018/analesps.30.2.158361>
- Piers, E. V., & Harris, D. B. (1996). *Piers-Harris Children's Self-concept Scale*. Western Psychological Services.
- Reijntjes, A., Kamphuis, J. H., Prinzie, P., Boelen, P. A., Van der Schoot, M., & Telch, M. J. (2010). Prospective linkages between peer victimization and externalizing problems in children: A meta-analysis. *Aggressive Behavior*, 37(3), 215-222. <https://doi.org/10.1002/ab.20374>
- Reyes, J. A., & Elias, M. J. (2011). Fostering social-emotional resilience among Latino youth. *Psychology in the Schools*, 48(7), 723-737. <https://doi.org/10.1002/pits.20580>
- Shkodriani, G. M., & Gibbons, J. L. (1995). Individualism and collectivism among university students in Mexico and the United States. *Journal of Social Psychology*, 135(6), 765-772. <https://doi.org/10.1080/00224545.1995.9713979>
- Spielberger, C. D. (1999). *State-Trait Anger Expression Inventory-2: Professional Manual*. Psychological Assessment Resources.
- Spielberger, C. D., & Reheiser, E. C. (2009). Assessment of emotions: Anxiety, anger, depression, and curiosity. *Applied Psychology: Health and Well-Being*, 1(3), 271-302. <https://doi.org/10.1111/j.1758-0854.2009.01017.x>
- Smith, D. C., Furlong, M. J., Jai, L., & Nakada, K. (2004). Best practices in school-based assessment of youth anger and hostility. In M. J. Furlong, M. C. Bates, D. C. Smith, & P. M. Kingery (Eds.), *Appraisal and Prediction of School Violence. Hauppauge* (pp-215-251). Nova Science Publishers.
- Sofronoff, K., Attwood, T., Hinton, S., & Levin, I. (2007). A randomized controlled trial of a cognitive behavioural intervention for anger management in children diagnosed with Asperger syndrome. *Journal of Autism and Developmental Disorders*, 37(7), 1203-1214. <https://doi.org/10.1007/s10803-006-0262-3>
- Strayer, J., & Roberts, W. (2004). Empathy and observed anger and aggression in five-year-olds. *Social Development*, 13(1), 1-13. <https://doi.org/10.1111/j.1467-9507.2004.00254.x>
- World Health Organization (2016). *Official WHO process of translation and adaptation of research instruments*. http://www.who.int/substance_abuse/research_tools/translation/en/
- Zhang, Y., Song, X., Ye, Q., & Wang, Q. (2015). Children with positive attitudes towards mind-wandering provide invalid subjective reports of mind-wandering during an experimental task. *Consciousness and Cognition*, 35, 136-142. <https://doi.org/10.1016/j.concog.2015.05.006>
- Western Psychological Services (2022, March 24). Children's Inventory of Anger. <https://www.wpspublish.com/chia-childrens-inventory-of-anger>