

■ Analysis of the psychometric properties of the Buss-Perry Aggression Questionnaire (AQ) in Colombian adolescents

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Abstract

The psychometric properties of the Buss and Perry AQ questionnaire of aggression, one of the most used questionnaires worldwide to measure aggressive behavior, were examined in a sample of adolescents (n=779 participants) from the cities of Barranquilla (n= 410) and Pereira (n= 369), in Colombia. In total, 752 participants (Mean age of 15.3 years, SD = 1.9; 57,4% women and 42,6 men) completed the Buss and Perry AQ questionnaire. Subsequently, the univariate and multivariate normality of the items was evaluated, and a confirmatory factor analysis (CFA) was performed on the data set. Likewise, the fit of two models was evaluated, a multidimensional a priori model, and a model with a second-order factor (aggressive behavior), which could explain the variance of the items. Finally, the reliability indices of the questionnaire were identified. The results showed acceptable goodness-of-fit indices ($X^2/df = 2.29$, $CFI = .977$, $IFI = .977$, $GFI = .984$, $AGFI = .979$, $RNI = .984$, $NFI = .972$, $RMSEA$ of $.047$ [90% $CI = .016 - .036$] and $SRMR = .059$) for the second-order one-factor model, as well as acceptable reliability indices ($\alpha = .55 - .88$). In conclusion, these results show that the scale can be applicable to Colombian preadolescents and adolescents, but warn of the limitations of its use for the non-aggression subscale. Nevertheless, the application of the scale in its original version is suggested to determine its psychometric behavior.

Keywords: Aggression; Validation; Adolescence; Psychometric properties; AQ questionnaire.

Resumen

Análisis de las propiedades psicométricas del cuestionario de agresividad (AQ) de Buss y Perry en adolescentes colombianos. Las propiedades psicométricas del cuestionario de agresión Buss y Perry AQ, uno de los cuestionarios más utilizados mundialmente para medir la conducta agresiva, fue examinado en una muestra de adolescentes (n=779 participantes) de las ciudades de Barranquilla (n= 410) y Pereira (n= 369), en Colombia. En total, 752 participantes (edad media de 15,3 años, DE = 1,9; 57,4% mujeres y 42,6 hombres) completaron el cuestionario AQ de Buss y Perry. Posteriormente, se evaluó la normalidad univariante y multivariante de los ítems, y se realizó un análisis factorial confirmatorio (AFC) sobre el conjunto de datos. Asimismo, se evaluó el ajuste de dos modelos, un modelo multidimensional a priori, y un modelo con un factor de segundo orden (conducta agresiva), que podría explicar la varianza de los ítems. Por último, se identificaron los índices de fiabilidad del cuestionario. Los resultados mostraron índices de bondad de ajuste aceptables ($X^2/df = 2,29$, $CFI = .977$, $IFI = .977$, $GFI = .984$, $AGFI = .979$, $RNI = .984$, $NFI = .972$, $RMSEA$ de $.047$ [90% $CI = .016 - .036$] y $SRMR = .059$) para el modelo de un factor de segundo orden, así como índices de fiabilidad aceptables ($\alpha = .55 - .88$). En conclusión, estos resultados muestran que la escala puede ser aplicable a preadolescentes y adolescentes colombianos, pero advierten de las limitaciones de su uso para la subescala de no agresión. No obstante, se sugiere la aplicación de la escala en su versión original para determinar su comportamiento psicométrico.

Palabras clave: Agresión; Validación; Adolescencia; Propiedades psicométricas; Cuestionario AQ.

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Aggression is a complex behavior in humans deeply associated with environmental and social factors. The manifestation of aggressive behavior in an individual can cause emotional or physical damage to others. Due to the complexity of this behavior, several classifications or types of aggression have been proposed, dividing it between direct or indirect (Warren et al., 2011), proactive (a purposefully planned attack with a reward as the goal), and reactive (response to a threat or frustrating event) (Wranghama, 2018). In addition to external factors, genetic and pathological characteristics can modify the aggressive reactions of a person. A broad spectrum of conditions including neurodegenerative (Levenson et al., 2014) and neuropsychiatric diseases (Pompili et al., 2017), toxicological (Ghossoub et al., 2019), metabolic (Herrera et al., 2018), and brain damage related (Williams et al., 2018), have shown a strong relation with aggressive behavior. Although aggression has been observed to be hereditary in some humans (Tuvblad & Baker, 2011), several genome-wide association studies (GWAS) have failed to identify a sole gene responsible for aggression (Odintsova et al., 2019). Despite this, many genes have been reported as possible candidates for human aggressive behavior, such as *RBFOX1* (essential for neuronal development) (Fernández-Castillo et al., 2020), the gene for monoamine oxidase A *MAOA* (an enzyme for the degradation of serotonin and catecholamines) (Kolla & Bortolato, 2020), and the mineralocorticoid receptor gene *NR3C2* (involved in stress responses) (Qing et al., 2021), among others. A significant challenge for aggression research to address the factors above has been to develop a questionnaire or a scale to provide an adequate measurement of aggression in individuals.

Human aggression has many dimensions, and encompassing them into a single instrument has been a problematic task. Therefore, many questionnaires and scales have been designed to tackle this issue. The Buss-Perry Aggression Questionnaire (BPAQ) (Buss & Perry, 1992), published in 1992, is one of the most used instruments in the assessment of human aggressive behavior. This questionnaire examines four factors divided into 29 items: Physical aggression (9 items), verbal aggression (5 items), anger (7 items) and hostility (8 items). Therefore, this questionnaire assesses overall aggression and its individual components, taking into account both physically and verbally aggressive behavior and two emotions associated with these types of aggressive behavior, anger, and hostility. The Buss-Perry Aggression Questionnaire has been successfully validated and applied in many countries and different languages (Morren & Meesters, 2002; Vigil-Colet et al., 2005), and also shortened versions of the questionnaire have been developed, as is the case with the BPAQ short form (BPAQ-SF) (Bryant & Smith, 2001; Zimonyi et al., 2021) or the Brief Aggression Questionnaire (BAQ) (Webster et al., 2014). The BPAQ has been validated for the Spanish language (Andreu Rodríguez et al., 2002; Gutiérrez Quintanilla & Sierra, 2007; Lymaries Padilla-Cotto et al., 2013; Reyna et al., 2011), and in Colombia for adolescents and young adults in the city of Medellín (Castrillón M et al., 2004). The BPAQ has also been validated for preadolescents and adolescents in Spain (Santisteban & Ma Alvarado, 2009), and applied in the city of Bucaramanga in Colombia (Chahín-Pinzón et al., 2012).

Adolescence is a critical period in human development, representing the transition from childhood to adulthood. The developmental changes encompass not only important physical, cognitive, and hormonal but also social aspects. The conceptualization and definition of adolescence, and therefore, its distinction from adulthood, has a significant impact on the scope and focus of laws, regulations, and policies (Sawyer et al., 2018). The adolescent brain undergoes radical changes in myelination and connectivity of areas crucial for

aspects such as emotions and decision-making (Bailen et al., 2018; Hartley & Somerville, 2015). Precisely, emotions related to aggressive behaviors, including anger and hostility occur frequently in adolescents, although only 5 to 10% of teenagers up to 16 years show significant persistent oppositional, disruptive, or aggressive behaviors (Buchmann et al., 2014). In fact, maladaptive aggression, particularly impulsive aggression, is one of the most common reasons adolescents are referred to neurological and psychiatric examinations (Connor et al., 2019). In addition, persistent aggressive behavior is a clinical manifestation of many conditions, including attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder, drug abuse, conduct disorder, depression, disruptive mood dysregulation disorder, and autism spectrum disorder, among others (Buchmann et al., 2014). The diagnosis of antisocial personality disorder (ASPD) is highly prevalent in prisons (~40%) and has been reported to be predicted by the presence of early adolescent (ages 12 to 14) aggressive behavior (Whipp et al., 2019). Also, aggressive behavior has been related to school dropout and unemployment (Bradshaw et al., 2010; Orpinas et al., 2018). Therefore, early and accurate prediction and identification of aggressive behaviors in adolescents (through instruments such as the BPAQ), followed by efficient interventions, is crucial to prevent these social and economic burdens.

Social and environmental aspects represent an important factor in the development of aggressive behavior in adolescents. Exposure to violence predicted the appearance of reactive aggressive behavior in teenagers (Myers et al., 2018). In addition, it was reported that higher reactive aggression was linked to increased variability in daily fear and increased emotionality, as opposed to proactive aggression, which was characterized by lack of emotionality (Moore et al., 2019). Furthermore, witnessing a violent act was associated with reactive aggression through both hostile attribution and response selection, while being a victim of violence predicted reactive aggression by means of hostile attribution only (Calvete & Orue, 2011). Colombians have suffered increased levels of violence due to a prolonged internal conflict usually fueled by activities such as drug trafficking and illegal mining, as well as by social disparities. This exposure to violence has taken a toll on adolescents' mental health, especially on those directly affected by the conflict (Marroquín Rivera et al., 2020). Thus, the application and validation of questionnaires like the BPAQ in Colombian adolescents are needed to evaluate the characteristics of aggressive behavior in a population frequently exposed to high levels of violence. The aim of the present study was to analyze the psychometric properties of the Buss-Perry Aggression Questionnaire (AQ) in the version validated for adolescents and young adults in Medellín, Colombia, by Castrillón - AQ (Castrillón M et al., 2004) and it is hypothesized that the instrument has acceptable reliability and validity indices for the population studied.

Methods

Participants

In total, 752 subjects were included in the study, with a women predominance (57,4%). The participants had a mean age of 15.3 years ($SD = 1.9$; range = 10-18), an education mean of 10,41 years ($SD = 2.2$; range = 3 to 16) and came from different socioeconomic status, ranging from 1 (lowest) to 6 (highest) (1 = 16.8%, 2 = 33.5%, 3 = 29.3%, 4 = 15.1%, 5 = 3.7%, 6 = 1.4%). See Table 1 for details regarding the demographic characteristics of the sample. Exclusion criteria were psychiatric illnesses and a history of traumatic brain injury, as well as abuse in

the consumption of psychoactive substances during the application. All adolescents had at least three years of schooling to ensure reading comprehension. The questionnaires were administered in the presence of a researcher and in a quiet environment.

Table 1. Descriptive Statistics of the Sociodemographic Characteristics of the participants (N=752)

Variable	Indicator	N (%)
Sex	Male	42.6% (N=320)
	Female	57.4% (N=432)
Age	10-12 years	10.9% (N=82)
	13-17 years	69.4% (N=528)
	18 years	19.7% (N=148)
Socioeconomic status	Strata 1-2 (low income)	50.4% (N=379)
	Strata 3-4 (middle income)	44.4% (N=334)
	Strata 5-6 (high income)	5.2% (N=39)
Years of completed education	Basic primary (3-5)	1.1% (N=8)
	Basic Secondary (6-11)	67.8% (N=510)
	Technological (12-14)	28.0% (N=211)
	University (14-16)	3.0% (N=23)

Instruments and Measures

The AQ Buss and Perry Questionnaire – Revised version (Castrillón M et al., 2002) was used. This is a questionnaire with 19 items and five dimensions; a) self-control of physical aggression (items; 1-7). b) perception of external hostility (items; 8-11). c) self-control of verbal aggression (items; 12-15). d) distrust (items; 16-17). e) non-aggression (items; 18,19). The questionnaire has a reliability of 95%, a level of significance of 5% (.05), a margin of error of 5%, and an $\alpha = .82$. The score range is: 5: completely true for me, 4: quite true for me, 3: neither true nor false for me, 2: quite untrue for me, and 1: completely untrue for me.

Procedure

A total of 779 participants were recruited in Colombia, although 27 subjects were excluded because they did not adequately complete the application questionnaires. Thus, 752 subjects were included in the study. A non-probabilistic quota sampling was performed in which they were involved according to their traits and qualities in relation to the inclusion criteria. Participants and parents were informed of the research and its confidentiality, and parents signed the informed consent. The ethics committee of the Catholic University of Pereira approved the research [CI-020-01], and the adolescents completed the application questionnaires voluntarily and without any compensation.

Statistical Analyses

Exploratory data analysis

Univariate and multivariate normality were evaluated in items and datasets. The Kolmogorov-Smirnov and Mardia tests were used for univariate and multivariate (Mardia, 1970) normal distribution, respectively. The mean, standard deviation, median, and proportion for each level of response were estimated to describe the performance of each item.

Validity

A confirmatory factor analysis (CFA) was performed on the dataset specifying the Castrillon (2004) factor structure (five-factor correlate model) and 19 items. In addition, the high-order model fit was evaluated, where a high-order model (aggressive) could explain the items variance. Several indices were used to test the goodness of fit: ratio, comparative fit index (CFI), incremental fit index (IFI), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), Bentler Relative Noncentrality Index (RNI), Bentler-Bonett Non-normed Fit Index (NFI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR).

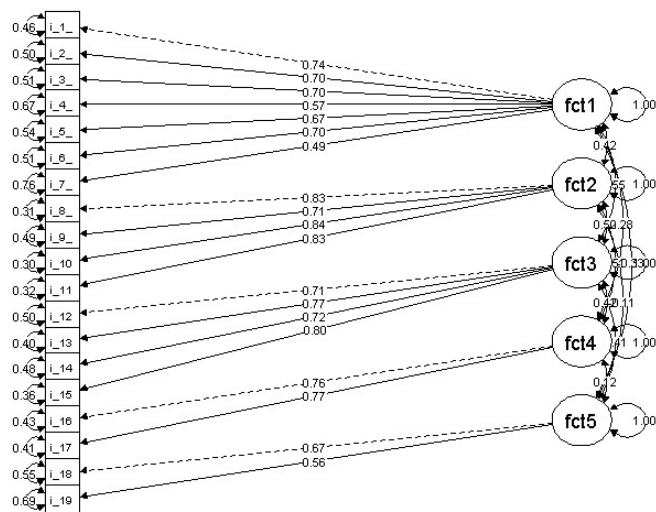
Table 2. Descriptive (Mean, Standard Deviation (SD) Minimum (Min) and Maximum (Max)), Statistic of Normality (Kolmogorov-Smirnov (KS)) and Proportion for each level of response by item.

	Descriptive information							Statistic of Normality		Proportion for each level of response				
	Mean	SD	Median	Min	Max	Skew	Kurtosis	Lilliefors (KS)	p value	1	2	3	4	5
Item_1	1.95	1.22	1	1	5	0.95	-0.36	0.32	<0.001	0.55	0.13	0.18	0.10	0.04
Item_2	2.62	1.42	3	1	5	0.20	-1.35	0.21	<0.001	0.34	0.13	0.21	0.21	0.11
Item_3	2.15	1.33	2	1	5	0.73	-0.83	0.29	<0.001	0.49	0.14	0.17	0.14	0.07
Item_4	1.56	1.07	1	1	5	1.88	2.44	0.43	<0.001	0.74	0.09	0.08	0.05	0.03
Item_5	1.74	1.14	1	1	5	1.42	0.89	0.37	<0.001	0.63	0.14	0.12	0.07	0.04
Item_6	1.92	1.28	1	1	5	1.05	-0.32	0.35	<0.001	0.59	0.11	0.13	0.12	0.05
Item_7	1.51	1.02	1	1	5	1.99	2.98	0.44	<0.001	0.75	0.09	0.09	0.05	0.03
Item_8	2.77	1.38	3	1	5	0.07	-1.20	0.18	<0.001	0.28	0.11	0.29	0.18	0.13
Item_9	2.90	1.39	3	1	5	-0.07	-1.26	0.17	<0.001	0.25	0.12	0.24	0.25	0.14
Item_10	2.83	1.35	3	1	5	0.00	-1.16	0.17	<0.001	0.25	0.13	0.29	0.21	0.13
Item_11	3.06	1.35	3	1	5	-0.23	-1.14	0.18	<0.001	0.20	0.12	0.24	0.28	0.15
Item_12	2.20	1.36	2	1	5	0.72	-0.81	0.28	<0.001	0.47	0.15	0.18	0.12	0.09
Item_13	2.23	1.37	2	1	5	0.67	-0.92	0.28	<0.001	0.47	0.14	0.18	0.13	0.08
Item_14	2.31	1.33	2	1	5	0.55	-0.98	0.24	<0.001	0.40	0.17	0.20	0.15	0.07
Item_15	2.51	1.46	2	1	5	0.40	-1.28	0.23	<0.001	0.38	0.15	0.17	0.17	0.13
Item_16	3.46	1.37	4	1	5	-0.49	-0.95	0.18	<0.001	0.14	0.10	0.23	0.23	0.30
Item_17	3.37	1.37	4	1	5	-0.43	-1.00	0.19	<0.001	0.15	0.11	0.22	0.26	0.26
Item_18	2.82	1.39	3	1	5	0.09	-1.23	0.15	<0.001	0.25	0.16	0.25	0.19	0.15
Item_19	3.04	1.49	3	1	5	-0.09	-1.36	0.16	<0.001	0.25	0.11	0.24	0.16	0.24

Table 3. Goodness-of-fit indices for the five-factor model and the five-factor model with second order. χ^2 = Normal Theory Weighted Least Squares Chi-Square; *df*=degrees of freedom; CFI=comparative fit index; IFI=Incremental fit index; GFI=Goodness-of-fit index; AGFI= Adjusted GFI; RNI= Relative noncentrality fit index; RMSEA=Root Mean Square Error of Approximation; SRMR= Standardized RMR.

Model/Fit	Model one (Five-factor)	Model two (Five-factor with second order)	Model two (Five-factor with second order included gender and age)
χ^2	223.19	392.90	0.000
<i>Df</i>	142	171	183
χ^2 / gl	1.570	2.297	0.000
CFI	0.992	0.977	0.961
IFI	0.992	0.977	0.961
GFI	0.991	0.984	0.982
AGFI	0.988	0.979	0.977
RNI	0.992	0.984	0.961
RMSEA	0.028	0.047	0.056
SRMR	0.046	0.059	0.064

Figure 1. Diagram of the confirmatory factor analysis of the Buss-Perry Aggression Questionnaire (AQ) in its 5 factors (fact 1; fact 2; fact 3; fact 4; fact 5).



Finally, Cronbach's and Omega coefficients were calculated from a total sample for the total score and subscale scores. Analyses were performed using R program 4.1.2 for Windows (R Development Core Team, 2020). MVN package (Korkmaz et al., 2014) was used to estimate univariate and multivariate normality distribution. The psych (Revelle, 2015) and Lavaan library (Rosseel, 2012) were used to conduct the reliability and CFA analyses respectively.

Results

Descriptive results

The Kolmogorov-Smirnov test showed that no item met the assumption of the univariate normal distribution ($p < .001$, see Table 2). Additionally, the items did not show multivariate normal distribution (Mardia Skewness = 5007.74, $p < .001$; Mardia Kurtosis = 46.20, $p < .001$). Items 11, 16, and 17 showed higher means with respect to the

Table 4. Sex and age parameters estimate influence (t-statistic and z-score)

Variable	Est.	t	z	P value	ci.lower	ci.upper
Age	-0.0072	0.005	-1.410	0.158	-0.018	0.003
Sex	0.047	0.020	2.295	0.022	0.007	0.087

Figure 2. Confirmatory factor analysis Diagram, second-order, taking into account the total score of the Buss-Perry Aggression Questionnaire (AQ).

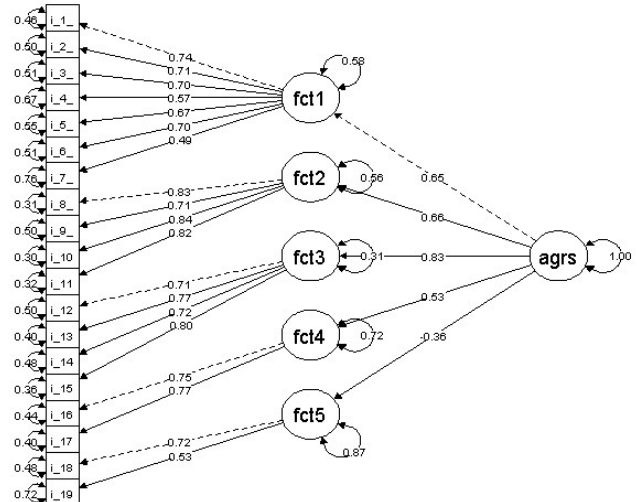
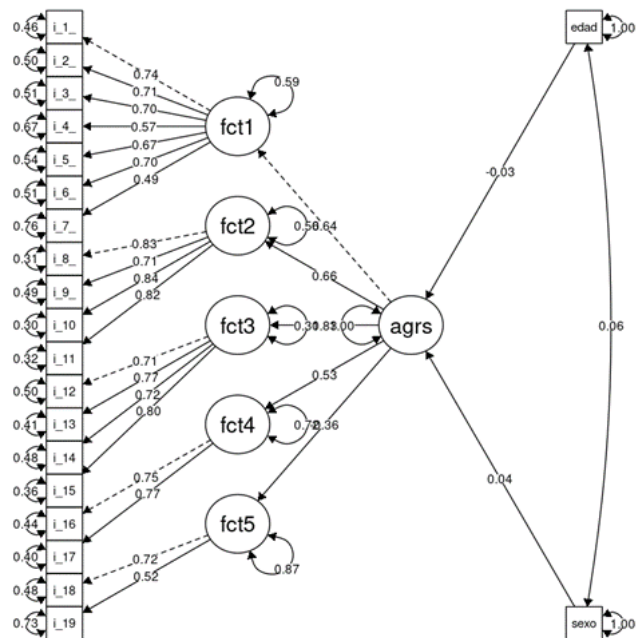


Figure 3. Confirmatory Factor Analysis Diagram, second order including age and sex of the Buss-Perry Aggression Questionnaire (AQ).



other items, indicating scores closer to the maximum possible value referring to agreeing with the statement made in the item. Concerning the proportions identified in each of the items, it was established that most of them were centered on scores between 1 and 3, except for items 16, 17, and 19, which had a higher proportion of responses in option 5, "completely true for me" (see Figure 1 and Table 2).

Confirmatory factor analyses

The five-factor correlate model fit was examined using CFA. Diagonally weighted least squares estimation was used, and indicators were modeled as ordered categorical variables (Liu et al., 2017). The goodness-of-fit tests provided initial evidence that overall, the five-factor solution was an adequate fit with the item scores because the ratio of the χ^2/df was 2.29 (critical ratio cut-off ≤ 2.0 to 3.0), $CFI = .977$, $IFI = .977$, $GFI = .984$, $AGFI = .979$, $RNI = .984$, $NFI = .972$, which were all above .95 (Hu & Bentler, 1999), the traditional cut-off establishing adequate fit. Other evidence suggesting an adequate fit of the five-factor solution with a second-order factor, although outside the expected ranges, was the $RMSEA$ of .047 [90% CI = .016 – .036] and $SRMR = .059$ (an $RMSEA$ and $SRMR < .06$ to .08) indicates a good fit Hu & Bentler, 1999. Item loadings on their latent constructs were statistically significant ($p's < .001$), suggesting that all items were a good index of their respective latent construct. The fit indices of each model are presented in Table 3 and Figure 2.

The analysis of the possible influence of sex and age on the aggressive behavior variable did not show significant differences for age ($z = -1.410$, $p = .158$), and a significant difference, although very low, for sex ($z = 2.295$, $p = .022$).

Reliability

Internal consistency reliability was assessed. Cronbach's alpha and Omega were calculated for each of the subscales, and for the overall scale. uses the estimates of uniqueness from factor analysis to find a random error (Revelle, 2015). For the factor 1 subscale, self-control of physical aggression (.85; = .83), factor 2 subscale "perception of external hostility" (.88; = .87), factor 3 subscale "self-control of verbal aggression" (.84; = .82), factor 4 subscale "distrust" (.73; = .57), factor 5 subscale "non-aggression" (.55; = .73), and the total scale (.88; = .92 [assuming five factor]) were all acceptably high.

Discussion of results

This study explored the psychometric properties of the AQ Buss and Perry Questionnaire-Revised in the Colombian preadolescent and adolescent population. This questionnaire has become a valuable tool for the assessment of aggressive behavior in the adolescent and adult population in different parts of the world, as shown by the multiple validations and psychometric analyses to which it has been subjected (Lymaries Padilla-Cotto et al., 2013; Reyna et al., 2011; Gutiérrez Quintanilla & Sierra, 2007; Andreu Rodríguez et al., 2002)

In general terms, it is an instrument that has undergone different transformations, evolving from its initial and original version by Buss & Durkee (1957), composed of 75 items and nine scales (Assault, Indirect Hostility, Irritability, Negativism, Resentment, Suspicion, Verbal Hostility, and Guilt) to the current version developed by Buss & Perry (1992), which consists of 29 items and four scales (physical, verbal, anger, and hostility). Despite its wide use around the world, the instrument has yielded divergent reliability indices according to the cultural and sociodemographic context in which it has been applied, which has required researchers to explore alternative versions with linguistic, cultural, and extension modifications, in many cases noticing the usefulness of reduced versions with better validity and reliability indices. (Castrillón M et al., 2002; Reyna et al., 2011; Vigil-Colet et al., 2005).

The AQ has been validated in Spain and Latin America with population samples in El Salvador (Andreu Rodríguez et al., 2002; Gutiérrez Quintanilla & Sierra, 2007), Puerto Rico (Lymaries Padilla-Cotto et al., 2013), Argentina (Reyna et al., 2011), and in Colombia, in the cities of

Bucaramanga (Chahín-Pinzón et al., 2012), and Medellín (Castrillón M et al., 2002). Specifically in Colombia, this instrument is beneficial considering the high rates of different types of violence that could explain aggressive behavior with multiple variables. In this sense, its validation in preadolescent and adolescent populations was considered with the purpose of providing a valuable tool to apply and evaluate intervention strategies. In this sense, the version adapted by Castrillón et al., 2004 was chosen, which included a population with similar ages, although in the present study, a younger population was incorporated.

The version of the AQ validated by Castrillón et al. (2004), who included the last scale, called non-aggression in their version, consists of 19 items, including five scales (self-control of physical aggression; perception of external hostility; self-control of verbal aggression; distrust and non-aggression).

In general, the results of this AQ version showed that the five factors explained 53.31% of the total variance explained, which was lower than that reported by Castrillón et al. (2004) in a young Colombian population (62.24%), showing less explanatory power of the data concerning the factors named by the Colombian authors.

The factorial validity analysis yielded indices with good fit and goodness of fit, showing a better fit of model two, which consisted of a unidimensional structure of the instrument, providing evidence of a second-order factor called "aggressive behavior" with admissible indices ($\chi^2/df = 2.29$, $RMSEA$ and $SRMR = .059$). These results cannot be contrasted with the psychometric behavior of other versions since the studies found have not reported goodness-of-fit indices for a unidimensional model of the scale.

On the other hand, the values obtained in the multidimensional model considering the structure of several factors ($CFI = .92$, $NFI = .90$, and $RMSEA = .049$) show coincidence with the linguistically adapted version for the Colombian population in Bucaramanga, including a university population (Chahín-Pinzón et al., 2012). This also coincided with studies of samples made up of Spanish adults ($RMR = .05$ $GFI = .93$ $AGFI = .92$ $RMSEA = .05$) (Andreu Rodríguez et al., 2002).

In addition to the results found in the Latino population, Zimonyi et al. (2021) found similar results in Hungarian university students, concluding that the confirmatory factor analysis of the AQ yielded moderate values ($\chi^2 = 1.245$, $p < .001$, $CFI = .82$, $TLI = .8$, $RMSEA = .077$, $SRMR = .080$ only at the edge of the universally used cutoff point for good fit), gathering (inconclusive) evidence of adequate scale functioning for different samples with ages located in adolescence and young adulthood.

This work also reviewed the structure of the instrument by gender, identifying that there were significant differences between men and women, although this was very low (4%). These results agree with what was found in a study on a Salvadoran sample, in which significant differences were found by sex, identifying higher physical scores in men and higher hostility scores in women (Gutiérrez Quintanilla & Sierra, 2007). Concurring, Zimonyi et al. (2021) found significant differences by gender, locating higher perspectives in total aggressiveness and physical aggression in men and higher probabilities in the anger scale in women. The difference found by sex shows the existence of higher scores in men than in women, however, it should be assumed with caution given that its p-value was very low, and although previous studies indicate significant differences, this may be overestimated.

Regarding the reliability of the instrument, this study found values ranging from $\alpha = .55$ to .88 for the scales (self-control of physical aggression $\alpha = .85$; $\omega_t = .83$; perception of external hostility $\alpha = .88$; $\omega_t = .87$; self-control of verbal aggression $\alpha = .84$; $\omega_t = .82$; distrust

$\alpha=.73$; $\omega_t=.57$; non-aggression $\alpha=.55$; $\omega_t=.73$), and values of $\alpha=.88$, $\omega_t=.92$ for the total scale. These results showed that the scale did not enjoy admissible levels of reliability in all subscales, given that low indices were presented in the non-aggression and distrust scales. However, the values varied according to the coefficient used.

The above results show that the evidence on the reliability of the scales of the instrument is still inconclusive. Although this situation markedly changes when performing the reliability analysis for the total scale in line with the results found by the confirmatory factor analysis, which showed a better fit of the scale in its total score considering aggressive behavior as a second-order factor.

In general terms, the reliability results coincide with those found with other Colombian populations for the reliability report of the instrument as a whole and as a single construct. However, this does not happen with the five-factor structure since values between 0.82 and 0.75 have been identified for physical aggressiveness, while for the other scales, this varies according to age, which is why its use has also been discouraged in children under 12 years old. (Chahín-Pinzón et al., 2012).

Regarding studies conducted with other populations, similarities were found with the reliability indices identified in different populations: Argentina between .70 and .80 (Reyna et al., 2011), Puerto Rico between .72 and 0.85 (Lymaries Padilla-Cotto et al., 2013), Salvador between .72 and .80, the overall consistency of .89 (Gutiérrez Quintanilla & Sierra, 2007), Spain between .68 and .86, for the total scale .88 (Andreu Rodríguez et al., 2002), Hungary between .64 and .85, and .90 for the total scale (Zimonyi et al., 2021).

The evidence compiled by this study shows results that are still inconclusive, given the need to review the use of the subscale called “non-aggression” due to its low-reliability indexes. Likewise, the factorial structure of the instrument is explained by five factors. However, it yielded admissible adjustment and goodness-of-fit indexes and showed better indicators than the results of a unidimensional scale model called “aggressive behavior.”

On the other hand, the non-existence of statistical differences by sex and age showed that, particularly for Colombian preadolescents and adolescents, it is possible to use the scale independently of sex and age, given that the results tend to be similar according to these characteristics. In this sense, it should be noted that one limitation of this study is the homogeneity of the socioeconomic characteristics of the participants. Therefore, it would be necessary for subsequent research to include populations with lower indicators of socioeconomic vulnerability.

On the other hand, it is important to note that the execution of this type of study should consider the concurrent validity of the instrument with the gold standard, which in this case is the instrument in its original version. Thus, making modifications that may alter the instrument's nature in favor of cultural adaptations that can result in an erroneous analysis of the original construct would be avoided.

Acknowledgements

Thanks to the Faculty of Health Sciences and Investigation Group I-Flor, University of Sinú, Montería, Colombia ; to the Department of Health Science, Public University of Navarra, Pamplona, Spain; the Health Research Institute of Navarra (IdiSNA), Pamplona, Spain; to the Neuroscience Research Group (NeURos), Neurovitae-UR Neuroscience Center, Institute of Translational Medicine (IMT), School of Medicine and Health Sciences, Universidad del Rosario, Bogotá, and finally thanks to the participants who were part of This process.

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