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Translation and Validation of Aggression Questionnaire in a Pakistani Children Cohort

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Buss and Perry Aggression Questionnaire (AQ) has been extensively used in literature for measuring aggression in children and adolescents. The purpose of the present study was to translate and validate the Buss and Perry 29 items Aggression Questionnaire and to examine its measurement model with originally postulated factorial structure given by Buss and Perry (1992). The scale was translated from English to Urdu through standardized forward backward translation procedure. To determine the measurement model of the translated scale, the data was subjected to confirmatory factor analysis to assess its factorial structure on Pakistani children. Construct validity of the scale was determined through convergent and discriminant analysis. Moreover, internal reliability and gender differences were also examined in the present study. The results of the measurement model suggested through confirmatory factor analysis revealed four factor solution of AQ originally suggested by Buss and Perry Aggression Questionnaire. The results of the reliability and validity analyses showed that the scale is highly reliable and valid for screening aggression in children of Pakistan. Gender differences have also been discussed in the light of the present research.

Keywords: aggression, measurement model, gender differences, Pakistan

Aggression is traditionally termed as a behavioral act that results in harming others intentionally or hurting them. Aggression can either be direct or indirect, reactive or proactive, physical, verbal or relation depending on the situation (Werner & Crick, 2004). An integrative explanatory model for aggression is proposed by Anderson and Bushman (2002) that situational and environmental factors interact with personal, emotional and cognitive aspects. A standout amongst the most utilized instruments for its study is the development of Aggression Questionnaire (AQ) by Buss and Perry (1992), which includes 29 items assembled into four factors: physical aggression, verbal aggression, anger and hostility. The initial two factors symbolize the active component. Anger triggers physiological and emotional component, while hostility involves feelings of opposition and injustice thus representing the cognitive component. Apparently, uncontrolled feelings of anger evolve perception of injustice and creates a bridge between cognitive and active component such as hostility and cynicism (Marten, Watson, & Wan, 2000).

Regarding the validation of the original Aggression Questionnaire by Buss and Perry, 29 items were extracted with four factor solution from exploratory factor analysis using OBLIMIN rotation namely Physical Aggression, Verbal Aggression, Anger and Hostility on a sample of 1253 participants, later confirmatory factor analysis on second and third sample confirmed the four factor solution. The internal consistency of the four factors were Physical Aggression $\alpha = .85$, verbal Aggression $\alpha = .72$, Anger $\alpha = .83$ and Hostility $\alpha = .77$ (Buss & Perry, 1992). He concluded results on the basis of his original study on measuring aggression in adolescents that male participants were more aggressive than females on a total scale and especially on physical aggression, whereas no significant results were concluded for anger in terms of gender differences. In the same direction, minor but significant differences were observed on verbal aggression and hostility subscales.

The AQ is validated in several countries and translated in several languages, the results of many studies on English speaking and non-speaking participants indicated four factor solution of AQ. Whereas, some studies suggested changes in the item composition because of language and cultural biases. Some researchers are in the support of discarding few items for better fit of the four factor solution, Nakano (2001) conducted a study on Japanese participants and Harris (1995) discarded two items from the scale for better fit of the model. Similarly, Meesters, Muris, Bosma, Schouten, and Beuving in 1996 suggested elimination of three items; one item from verbal aggression and two from hostility on a sample of Dutch for better fit of the original model.

One of the research in support of the four factor solution and in terms of internal consistency and construct validity was conducted in Spain by Garcia-Léon et al., 2002; Rodriguez, Peña, and Graña, 2002. Another study conducted in Germany support the originally postulated four factor solution and concluded highly satisfactory psychometric properties of AQ as internally consistent and validated through concurrent and construct validity (von Collani, & Werner, 2005).

In line of the previous studies, a French Version of AQ was translated in Canada by Bouchard in 2007; he supported the internal consistency of the scale through test re-test reliability and the criterion and construct validity. He also confirmed the four factor solution of the AQ. Whereas, another study conducted in Spain suggested the elimination of two items from the scale for better fit of the four factor model of AQ (Sierra, & Gutiérrez, 2007).

A study in southern Italy revealed a little change in results of validation study of AQ on a sample of 860 students; he proposed three factor solutions after confirmatory factor analysis instead of four factors; Physical Aggression, Hostility and "Inability to verbalize anger" (Sommantico, Osorio, Parello, De Rosa, & Donezetti, 2008). Another study on Italian population was

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conducted by Fossati et al., 2003, he tested the psychometric properties of the scale on three independent samples; a clinical sample (N = 461), a first non-clinical sample (N= 563) and a second non-clinical population (N = 1029). The results of his study replicating the results of the four dimensionality of AQ originally proposed by Buss and Perry (1992) and the results were in the support of the internal consistency of the scale for Italian clinical and non-clinical population, therefore statistically valid for measuring aggression (Fossati et al., 2003; Maffei, 2008).

Many studies reported in the literature have used non-clinical subjects from student populations, therefore a more heterogeneous sample is needed to support the generalizability of AQ results, a study was carried out on Hungary population (N = 1200) by Gerevich, Bácskai, Czobor, (2007). They concluded the same structure of AQ and confirmed the benefit of using the scale with clinical population. In short, the studies focused more on clinical population suggested poor fit of the four factor solution of AQ and with respect to its internal reliability and validity (Fossati et al., 2003; Morren, & Meesters, 2002; Williams et al., 1996).

The core objective of the present study on the basis of the discussion above is to examine the factorial structure and psychometric properties of Urdu Version of the AQ on a sample of Pakistani children.

Method

Sample I

Sample of 30 children aged 11 to 13 years (*M* =12.33; *SD* =1.22) 15 boys and 15 and girls was drawn from two public schools of Lahore. Participation was voluntary and anonymous. Sample I was recruited for initial pilot testing of the translated scale.

Sample II

Sample II comprising 200 children (100 girls and 100 boys) with an age falling in the range of 10 to 14 years (M = 12.53, SD = 1.10). Participants were selected on voluntarily basis from two main stream schools of Lahore (Pakistan). Sample II was drawn for the validation of translated measure.

Table 1

Demographic Characteristics of Sample I (n =30) and Sample II (n = 200).

Variables	Sample I (*N* = 30)		(*N* = 200) Sample II	
	M (SD)	*f (%)*	*M (SD)*	*f (%)*
Age	12.33(1.22)		12.53 (1.10)	
10-12		13 (43.35)		47(47)
13-15		17 (56.65)		53(53)
Gender				
Girls		15 (15)		100 (50)
Boys		15 (15)		100 (50)
Class	7.33 (1.62)		7.37 (1.18)	
Middle		25 (83.35)		56 (56)
High		5 (16.65)		44(44)

Note: *f* = frequencies, *M* = Mean, *SD* = Standard Deviation

Measure

Buss and Perry Aggression Questionnaire (1992): The AQ consisted of 29 self-report items on a likert scale of five points ranging from one ('extremely uncharacteristic of me') to five ('extremely characteristic of me'). The originally retained four subscales after the factor analyses were "Physical Aggression" (PA, 9 items), "Verbal Aggression" (VA, 5 items), "Anger" (AN, 7 items) and "Hostility" (HS, 8 items). The scale was translated in Urdu after getting the formal permission from the original author by using the standardized form of translation and adaptation procedure.

Step I: Forward translation

Forward translation was carried out from English to Urdu by three bilingual experts independently. Instructions were given to the experts to translate the items conceptually rather than literally and also age of the children must kept in mind while translating the items.

Step II: Backward translation

After reconciliation of the forward translation, each item was assessed on the basis of semantic equivalence and precision. Afterwards, the forward translation was given to two new experts for backward translation i.e. from Urdu to English.

Step III: Pre-testing

Cognitive interviews with 30 children of 11-13 years was conducted to assess their understanding on each items. There was a word "*provocation*" in item 2 which the children less than 11 years had difficulty in reading and understanding so a simple meaning was used for provocation. After pretesting, Pearson Product Moment was carried out to assess the inter item correlation of each item and it was above the .7 for all the items showing the significant relationship between the English and the Urdu Version (see Table 2).

Procedure

Informed consent was taken from the students to complete the AQ along with Child Behavior Checklist (Achenbach, 1992) and Bar on Emotional Intelligence Quotient; Youth Inventory (1997) for assessing the convergent and divergent validity of the AQ. The students completed the three measures in 30 minutes in their regular class timings.

Results

The data of the present study analyzed through SPSS (16 Version) and AMOS (19 Version) for descriptive and inferential statistics.

Table 2.

Inter-item Correlation Between English and Urdu items on AQ.

Item	*r*	*Item*	*r*	*Item*	*r*
1	.99	11	.94	21	.86
2	.83	12	.98	22	.92
3	.93	13	.87	23	.97
4	.95	14	.85	24	.68
5	.97	15	.93	25	.97
6	.91	16	.98	26	.87
7	.99	17	.89	27	.73
8	.97	18	.91	28	.99
9	.89	19	.76	29	.84
10	.83	20	.72		

Table 2 shows the Inter-item correlations between the English and translated Urdu version of Aggression Questionnaire. Statistics

indicate that items of English and translated Urdu Aggression scale are highly correlated ($p < .001$). Most of the items (1, 3, 4, 5, 6, 7, 8, 11, 12, 15, 16, 18, 22, 23, 25, & 28) are highly correlated ($r > .9$), other items (2, 9, 10, 13, 14, 17, 21, 26, & 29) are moderately correlated ($r > .8$), and the remaining items (19, 20, 24, & 27) are significantly correlated as well ($r > .6$). In short, all the items in the translated Urdu Aggression scale are highly similar to the English Aggression scale.

Table 3.
Reliability Analysis of Urdu and Original AQ.

Subscales	*K*	*M(SD)*	*α*	*α (Buss & Perry, 1992)*
PA	9	26.66(8.98)	.80	.85
VA	5	16.20(5.23)	.79	.72
AN	7	22.67(7.28)	.77	.83
HS	8	26.38(8.57)	.82	.77
Total AQ	29	91.93(27.11)	.93	.80

Note*: k* = No of items, *M (SD)* = Mean (Standard Deviation), *α* = Cronbach's alpha

Table 3 shows the reliability of Urdu aggression scale. The Urdu Aggression Scale has four subscales: "Physical Aggression", "Verbal Aggression", "Anger", and "Hostility". The results indicate that Physical aggression and Hostility subscale (M = 26.66, SD = 8.98; M = 26.38, SD = 8.57 respectively) are highly reliable with the cronbach's alpha of .803 and .821 respectively. Verbal aggression subscale and Anger subscale (M = 16.20, SD = 5.23; M = 22.67, SD = 7.28 respectively) are moderately reliable with cronbach's alpha of .785 and .770 respectively.

Table 4
Inter-correlation Matrix for the Aggression Questionnaire (AQ) and Subscales (N=100)

Subscales	1	2	3	4	5
AQ Total	-	.921**	.825**	.923**	.909**
Physical	-		.677**	.809**	.762**
Verbal	-	-	-	.721**	.676**
Anger	-	-	-	-	.781**
Hostility	-	-	-	-	-
Mean	91.93	26.66	16.20	22.67	26.38
SD	27.11	8.98	5.23	7.28	8.57

***P*< 0.001

Table 4 shows the inter-correlation Matrix of Aggression Questionnaire and its subscales. The results indicate that the Aggression Questionnaire is highly correlated with all of its subscales, that is, "Physical aggression", "verbal aggression", "anger", and "hostility" ($r = .921, .825, .923, \& .909$; $p < .01$). This shows that the subscales adequately measures and taps the areas which can determine aggression. Furthermore, the subscales show significant inter-correlation as well, "Physical aggression", "verbal aggression", "Anger", and "hostility" subscales are highly correlated at the level of $p < .01$.

Table 5 shows the convergent and discriminant analysis of Aggression Questionnaire (AQ) with subscales of Emotional intelligence (EQ) scale and Child Behavior Checklist (CBCL). The results indicate that AQ scale shows significant negative correlations with the subscales Optimism, Happiness, and Impulse Control of EQ scale ($r = -.684, -.670, -.679$; $p < .01$ respectively), however a significant positive correlation can be observed with the subscales Rule breaking behavior and Aggression of CBCL ($r = .705, .684$; $p < .01$ respectively). It can be concluded that the Aggression Questionnaire shows significant convergent and divergent validity.

Confirmatory Factor Analysis (CFA)

Before conducting CFA maximum likelihood estimation, the data were screened for outliers and normality and found appropriate for this analysis. CFA model fit was analyzed on 29 items in a new set of data (N = 200) to assess the factorial structure postulated by original Buss & Perry Aggression Questionnaire. Figure 1 depicts the loadings on each factor and resulted in the support of our initial EFA loadings of 4 factor solution.

Table 7 showed the standardized factor loadings on CFA of 4 factor solution of AQ. The factor loadings were in the range of .47 to .87, which were significant. The results of the factor loadings were consistent with the EFA loadings. There were two items (13 & 29) with relatively low loadings ranging from .47 to .48, the results of the EFA showed the similar result on item 29 (.312) with low loadings. One reason could be the reverse scoring effect of the item 29 but we could not get the similar result for the other reverse item (26).

Table 6 indicated the fit indices (maximum likelihood) of AQ in the new sample. The results showed the adequate fit of the model for the 4 dimensional structure, $\chi^2 = 1072.46$ ($df = 374$, $N = 200$), $P<.05$, RMSEA = .061, CFI = .905 and TLI = .902. Overall, the results demonstrated the support of the EFA four factor solution. The value of chi square is significant because of greater degree of freedom; therefore by dividing degree of freedom by chi-square (χ^2 /df) the value is 2.86 which is acceptable for model fit (Hu, Bentler & Kano, 1992).

Table 5.
Convergent and Discriminant Validity of AQ.

	AQ	EQ-i			CBCL	
Subscales	Total	Optimism	Happiness	Impulse Control	Rule Breaking Behavior	Aggression
Total	-	-.68**	-.67**	-.68**	.71**	.68**
Optimism	-	-	.80**	.53**	-.54**	-.58**
Happiness	-	-	-	.55**	-.52**	-.53**
Impulse Control	-	-	-	-	-.58**	-.46**
Rule Breaking Behavior	-	-	-	-	-	.81**

***P* < .001

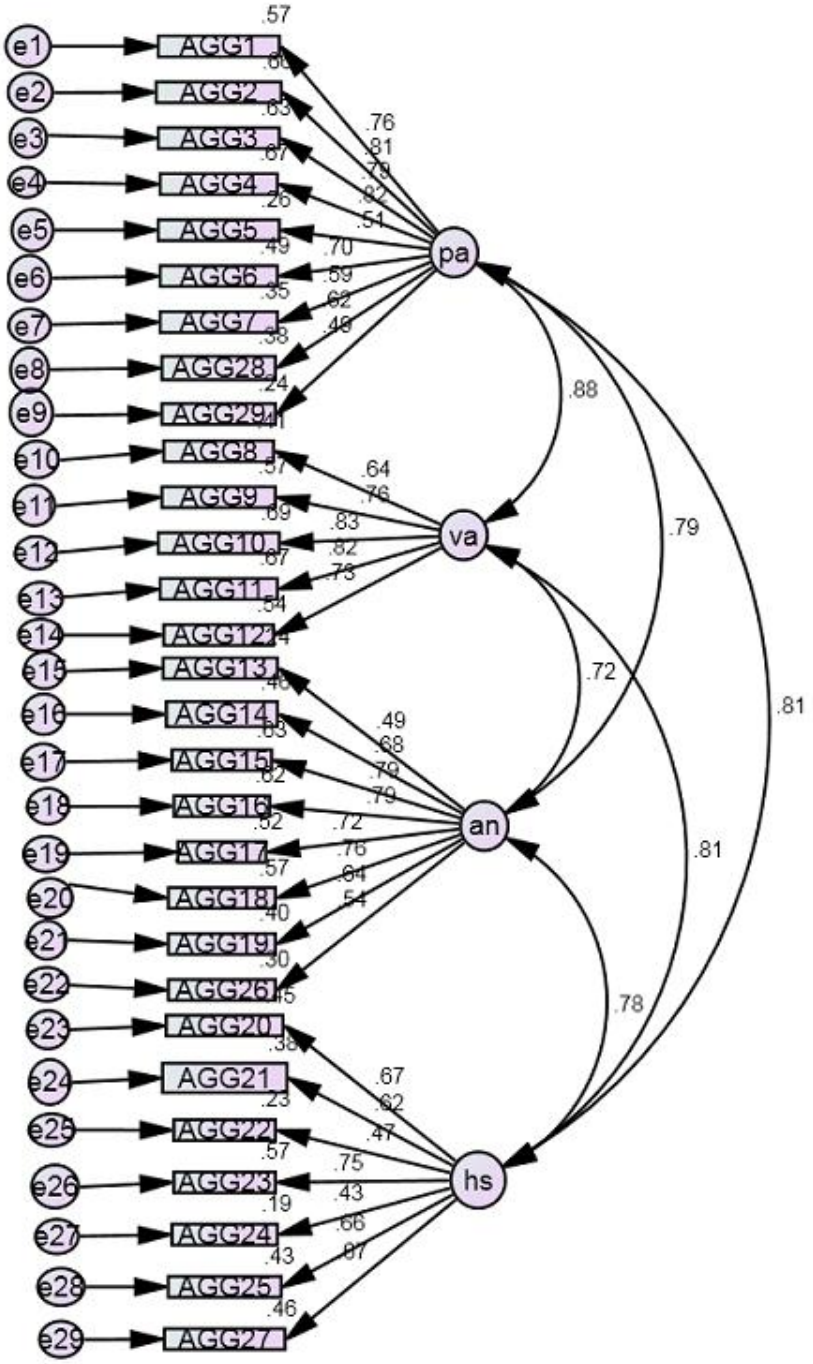

Figure 1. CFA 4-Factor solution of Aggression Questionnaire

Table 6
Fit Indices of 4-Factor Solution of AQ Model

Model	χ^2	RMSEA	CFI	TLI
4-Factor Solution	1572.46	.061	.895	.892

P < .05, *df* = 374

Table 7
Standardized factor loadings of CFA model for the 4-factor solution of AQ

Items	Factor Loadings (*N* = 200)			
	Factor 1 (PA)	Factor 2 (VA)	Factor 3 (AN)	Factor 4 (HS)
Physical aggression (PA)				
"Once in a while I can't control…."	.76			
"Given enough provocation, I may…."	.81			
"If somebody hits me, I hit back".	.79			
"I get into fights a little more than…."	.82			
"If I have to resort to violence to…"	.51			
"There are people who pushed me…."	.70			
*"I can think of no good reason for…."	.59			
"I have threatened people I know".	.62			
"I have become so mad that I have.."	.48			
Verbal Aggression (VA)				
"I tell my friends openly when I…."		.64		
"I often find myself disagreeing…"		.76		
"When people annoy me, I may tell…"		.83		
"I can't help getting into arguments…"		.82		
"My friends say that I'm somewhat…"		.78		
Anger (AN)				
"I flare up quickly but get over it…."			.49	
"When frustrated, I let my irritation…"			.68	
"I sometimes feel like a powder…"			.79	
*"I am an even-tempered person".			.79	
"Some of my friends think I'm a…."			.72	
"Sometimes I fly off the handle…"			.76	
"I have trouble controlling my temper".			.64	
Hostility (HS)				
"I am sometimes eaten up with…."				.67
"At times I feel I have gotten a raw…"				.62
"Other people always seem to get…."				.47
"I wonder why sometimes I feel so…"				.75
"I know that ''friends'' talk about…."				.43
"I am suspicious of overly friendly…"				.66
"I sometimes feel that people are…."				.87
"When people are especially nice…."				.54

*items with reversed scoring

Table 8.
CFA Sample Maximum Likelihood Solution: Factor Correlations

Factor	PA	VA	AN	HS
PA	-	.88***	.79***	.81***
VA	-	-	.72***	.81***
AN	-	-	-	.78***
HS	-	-	-	-

****P* < .0001

Table 9
Means, SD and t-values of girls and boys on total subscales of Aggression Questionnaire (AQ)

Variables	Girls (100)		Boys (100)				95% CI	
	M	*SD*	*M*	*SD*	*t*	*p*	*LL*	*UL*
PA	83.27	27.22	98.07	29.18	-4.90	.000	-9.54	-4.07
VA	15.73	7.78	16.68	6.16	-1.21	.225	-2.48	0.58
Anger	20.85	6.86	23.82	8.37	-1.21	.007	-5.10	-0.83
Hostility	26.74	9.17	26.37	9.95	-2.74	.784	-2.29	3.03
AQ Total	83.27	27.22	98.07	29.18	-3.70	.000	22.67	6.92

Note: CI = confidence interval, LL = lower limits, UL = upper limits.
PA = "Physical Aggression", VA = "Verbal Aggression", ANG = "Anger" & HS= "Hostility"
$p < .05$, $p < .001$

Table 8 showed the factor correlations on CFA sample. The results showed highly significant positive correlation among all the factors. The factor correlation also supported and consistent with the original sample.

The Table indicates that boys scored high on aggression questionnaire than Girls (M = 98.07 (29.18), t = -4.90. While on hostility there was no significant difference between the genders (t = -2.74). In addition, both genders scored high on physical aggression with a significant difference.

Discussion

The present study focused on examining the measurement model of Aggression Questionnaire (AQ) by Buss and Perry (1992) on Pakistani children. The main objective of the study was to analyze the factorial structure of AQ and compare its psychometric properties with the original scale. The results of the inter item correlation of the original and the translated scale were significant, suggesting the similarity of original and translated scale. The internal consistency of the total scale and the subscales was in consistent with the original reliability for the total scale and the subscales proposed by Buss and Perry (1992).

For validation study of the Urdu Version of AQ, reliability coefficients were high. The construct validity of the scale was determined through convergent and divergent validity, the results indicated that Urdu version of AQ was significantly positively correlated with Child Behavior Checklist (CBCL, Achenbach, & Rescorla, 2000) subscale of Aggression and Rule Breaking Behavior while it is highly negatively correlated with Bar On Emotional Quotient; Youth Inventory (1997) subscale of General Mood (Happiness and Optimism). A recent study on the validation of AQ was conducted on Chilean students by Peralta, Pedrero, Bravo, & Giraldez, (2014), the convergent validity was determined through the two aggression subscales of Conflict Tactics Scale (CTS) and the Salvo Impulsivity Scale (SIS), resulting in the consistency of the results with the previous studies.

Another main tenet of the study was to replicate the four factor structure of the Buss and Perry Aggression Questionnaire on Pakistani children. The results showed that the existence of four factor structure through confirmatory factor analysis with proximate to an adequate fit of the model. The results are consistent with the previous studies where AQ replicated the four factor structure in different countries like United States (Bernstein & Gesn, 1997), Italy (Fossati et al., 2003), Germany (von Collani & Werner, 2005), and Greece (Tsorbatzoudis, 2006).

The investigation of Gender differences on AQ was another major goal of the study, the results showed that boys were more physically aggressive than girls and they even scored higher on the total scale than girls. The results are in line with the previous results on physical aggression subscale and total scale (Buss & Perry, 1992; Garcia- Leon et al., 2002; & von Collani & Werner, 2005). The reason for this contribute to the fact that physical aggression is biologically predetermined in men for evolutionary survival than women (Cross & Campbell, 2011). The hostility scale showed non-significant differences among the gender suggesting that both boys and girls can have hostile aggression. The boys scored higher on Anger than girls, the results are not consistent with previous researches, and the reason for this would contribute the cultural norms of Pakistani society where usually girls are not supposed to express anger openly and aggression generally.

Conclusion

Concluding, the current findings support the measurement model of 4-dimensionality structure of the Buss and Perry AQ -Urdu Version, as reported in the original study (Buss and Perry 1992). The present study's findings also indicate that the translated version is a reliable and valid instrument for screening aggression in the Pakistani population. The results support the hypotheses that boys show more physical aggression than girls.

Limitations and Suggestions

The main limitation of this study was the sample size and the sampling method. This sample might not be representative of Pakistani adolescents. Hence, further studies should seek to obtain

probabilistic and more heterogeneous samples, thereby to facilitate the generalizability.

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