

## Behavioural Problems Scale (BPS): Construction and Validation

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### ABSTRACT

The objective of the study was to develop Behavioural Problems Scale (BPS) and to investigate its psychometric properties in Indian sample of adolescents. To assess behavioural problems, 18-item draft was formulated by the researcher based on Achenbach and Rescorla Model of Behavioural Problems (2001), with emphasis on the cultural appropriateness. 10 items were finalized in the final draft. Data on 1,129 participants, of which 548 were male and 581 were female adolescents, aged 16 to 20, collected from different higher secondary institutions of Anantnag, Baramulla, and Srinagar area of Kashmir valley were examined. Principle Component Analysis was conducted to assess the construct Validity. The model was further tested with Confirmatory Factor Analysis. To establish the validity of the test interpretations, the convergent validity of the test was assessed by correlating the test with Brief Problem Monitor-YF (Achenbach, et al., 2011); Beck Depression Inventory; and Beck Anxiety Inventory (BDI & BAI; Beck & Steer, 1993). Cronbach's Alpha was then computed to assess the internal consistency of the scale. The results indicated that the BPS has satisfactory content, construct and convergent validity; and has appropriate internal consistency. Therefore, the BPS is more appropriate than the western-context developed measures to measure the behavioural problems in Indian Adolescents.

**Keywords:** *Behavioural Problems Scale, Validity, Reliability, Factor Structure*

Behavioural problem has been defined as the act of a person who either exerts significant negative impact on his/her quality of life or the quality of life of others, or forms significant risk to the health and/or safety to oneself or others (O'Brien, 2003). Internalizing and externalizing problems are two empirically derived dimensional constructs that have been used frequently to operationalize adolescent behavioural problems (Achenbach & Rescorla, 2001). Internalizing behavioural problem is defined as consisting of anxious and affective symptoms (like worry, sadness, hopelessness, physical symptoms, etc) (Dekovic, Buist, & Reitz, 2004). Externalizing behavioural problem is defined as consisting of aggressive and delinquent behaviours (like fighting, vandalism, stealing, lying, and other rule breaking behaviours) (Achenbach et al., 2002). Specifically, internalizing problems are a broad class of co-occurring problems that mainly involve inner distress whereas externalizing problems

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mainly involve conflict with others and social mores. Internalizing problems include depression and anxiety whereas externalizing problems primarily consist of aggression and conduct disorder as the two primary components (Achenbach & Rescorla, 2001). In the current study, internalizing and externalizing behavioural problems were taken as two global constructs of behavioural problems. The terms used are not diagnostic labels but descriptors of the problem behaviours, to identify patterns that mark important differences between groups of individuals and not a diagnosis of the behavioural problems.

### ***Internalizing and Externalizing Behavioural Problems***

The biological, social, and cognitive changes that occur in adolescence mark a period of vulnerability (Reitz, Dekovic, & Meijer, 2005). The increase in psychiatric disorders, labiality, and behaviour problems before and after puberty seem to indicate this increased vulnerability (Arnett, 1999; Moffitt, 1993; Zahn-Waxler, Kilmes-Dugan, & Slattery, 2000). The typical manifestations of the clinical and behavioral problems experienced from childhood into adolescence have been described within two broad categories labeled internalizing and externalizing (Achenbach & Rescorla, 2001). Internalizing describes affective problems such as depression, anxiety, and withdrawal. Externalizing includes aggression and delinquency as core behaviours, but also includes school problems and oppositional problems. The empirically derived internalizing and externalizing categories encompass the most common problems found in children and adolescents. For example, in a sample of 2,600 youth and adolescents (ages 4-16) from the general population, 4.6 to 7.7% of the participants were found to be in the clinical range for internalizing and externalizing syndromes (McConaughy & Achenbach, 1994).

In general, internalizing problems are described by an internal disruption or painful moods and emotions whereas externalizing problems are described by behaviours that hurt and are disruptive to others (Zahn-Waxler et al., 2000). Specifically, internalizing problems are a broad class of co-occurring problems that mainly involve inner distress whereas externalizing are problems which mainly involve conflict with others and social mores (Achenbach & McConaughy, 1997). The anxiety and depression manifested in internalizing problems, and the aggression and antisocial behaviours in externalizing problems, are typically on a continuum of severity and do not necessarily reflect a clinical diagnosis. However, they do seem to be common among adolescents.

An issue pertaining to internalizing and externalizing problems is whether they are the result of one underlying factor or multiple factors. Jessor and Jessor (1977) argue that one factor structure underpins adolescent externalizing problems. They categorized these problems as alcohol and drug use, delinquent behavior, and precocious sexual intercourse. Jessor and Jessor argued that unconventionality might be the underlying factor, and some research has supported this claim (e.g., Donovan & Jessor, 1985; Flannery, Williams, & Vazsonyi, 1999). Alternatively, some studies have reported a two-factor structure and others three factor structure in externalizing problems (e.g., Farrell, Kung, White, & Valois, 2000; Gillmore, Hawkins, Catalano, Day, & Moore, 1991). When internalizing and externalizing have been

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studied together, two separate factors have been found (Brack, Brack, Orr, 1994) leading to the conclusion that externalizing and internalizing are distinct forms of problems. Rietz et al. (2005) conducted longitudinal factor analyses of the structure and stability of internalizing and externalizing problems. The participants were high school adolescents ( $n = 650$  at time &  $n = 563$  at time two) between the ages of 13-15. The results of the study confirmed that internalizing and externalizing are two distinct constructs, but are also manifestations of a syndrome of behaviours problems.

The overall purpose of the present study was to develop a set of relatively short and easy to administer questionnaires appropriate to Indian culture and society in order to measure behavioural problems in a broader base of participants and potentially beneficial for the research purposes.

## METHODS

### *Sample and Design*

The study was conducted in Kashmir Valley of India. The population of the study comprised of adolescents studying in higher secondary schools of the valley. The data was collected, utilizing purposive sampling, from the available students of different higher secondary schools Baramulla, Anantnag, and Srinagar area. The total sample consisted of 1,129 adolescents, of which 548 were male and 581 were female adolescents, aged 16 to 20.

### *Instruments*

- **Behavioural Problems Scale (BPS):** A draft of 18-items was formulated by the author based on Achenbach and Rescorla Model of Behavioural Problems (2001), with emphasis on the cultural appropriateness. The items were further evaluated for the content validity, and 10 items were selected in the final draft with responses ranging from 1 (*never*) to 5 (*most often*). Higher score indicates higher Behavioural Problems.

1. I feel loss of sleep every night
2. I feel very happy
3. I feel life is not worth living
4. I feel no one loves and cares for me
5. I feel crying, irritable or annoyed
6. I am not fearful, anxious or worried
7. I feel tired or dizziness without any reason
8. I feel sick or have headaches, stomachaches, nausea, aches and pains
9. I feel loss of appetite
10. I hate myself and don't like to be with others
11. I do not argue and disobey my parents and teachers
12. I cheat or break rules at home, school and elsewhere
13. I lie to my parents or teachers or others
14. I steal things
15. I destroy things when angry

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16. I get into fights
17. I use abusive language
18. I race my bike or scoote

**Brief Problem Monitor (BPM-YF)** Achenbach and Rescorla, 2011). Six items for assessing internalizing problem and 7 items for assessing externalizing problem were used, to which participants responded on a 3-point scale ranging from 0 to 2.

**Beck Depression Inventory (BDI; Beck & Steer, 1993).** The BDI is 21 item self-report questionnaire that assesses depression severity on a 4 point scale ranging from 0 to 3.

**Beck Anxiety Inventory (BAI; Beck & Steer, 1993).** The BAI consists of 21 items and measures the presence and severity anxiety symptoms on a 4 point scale from 0 to 3.

### Statistical Analysis

Statistical analyses were conducted using SPSS and AMOS version 20.0 software packages. To analyze the reliability of the BPS scores, Cronbach's Alpha ( $\alpha$ ) was computed to assess the internal consistency of the BPS scores. In order to test the theoretical structure of the BPS, Exploratory Factor Analysis (EFA) was used. Confirmatory Factor Analysis using AMOS (Arbuckle & Wothke, 1999) was performed to assess the model fit.

Pearson's product moment correlation was applied to assess the convergent validity by correlating BPS to the other available measures. Finally Cronbach's Alpha was computed to assess the internal consistency of the measure.

## RESULTS

### *Two-dimensional Structure of the Behavioural Problems Scale*

Exploratory factor analysis was applied to assess the factor structure of the Behavioural Problem Scale. Prior to the factor analysis, several preliminary analyses were performed. The items were analyzed for descriptive statistics (see table 1) and inter item correlations. Since large sample are preferred for these analyses, sampling adequacy was tested. As such, Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were performed. The sample size is considered adequate if KMO value is more than 0.50 and Bartlett's test of sphericity is significant if p value is less than 0.05 (Field, 2009). The preliminary analysis of BPS was found to be satisfactory. Data was checked for Multicollinearity (Determinant = .14 > .00001), revealing no problem. The KMO test (KMO = .79 > .5) verified the sampling adequacy for the analysis. Bartlett's Test of Sphericity, examining whether the R-Matrix resembles the Identity Matrix, was found significant ( $X^2(45) = 1678.77, p < .001$ ), indicated that correlation between items sufficiently large for factor analysis. The values of the Anti-image correlation matrix were above 0.5 for all items (all KMO values > .7). The average of the Communalities was .47 (see Table No.1).

**Table No.1 Descriptive Statistics and Communalities for the items of BPS**

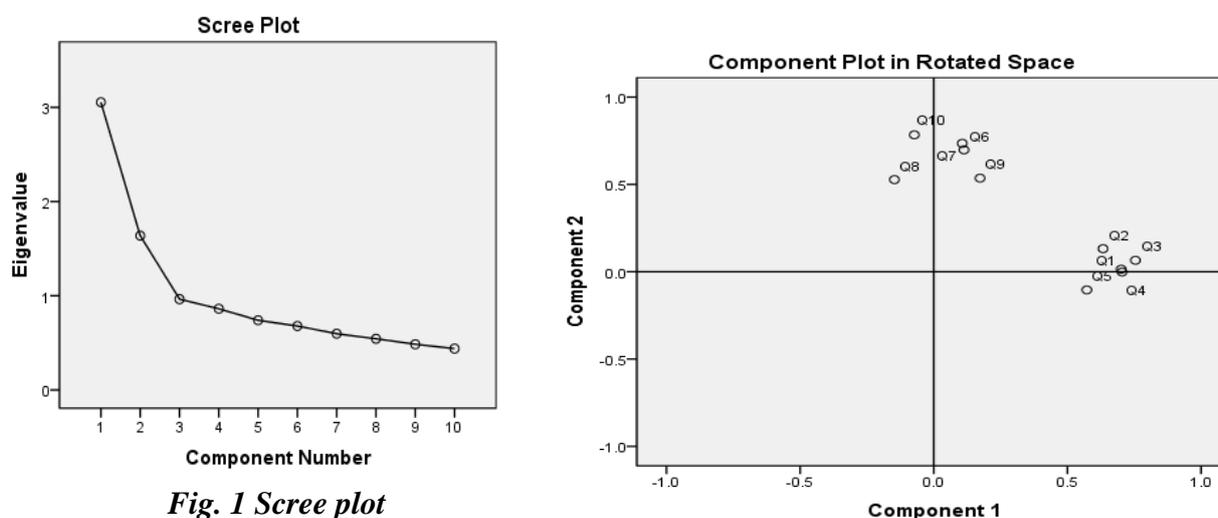
	Items	M	SD	$h^2$
1)	I feel sad	3.04	.99	.50
2)	I feel my life is not worth living	2.32	1.21	.46

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	Items	M	SD	$h^2$
3)	I cry, get irritable or annoyed	2.65	1.16	.60
4)	I am fearful, anxious, or worried	2.59	1.22	.50
5)	I feel sick or have headaches, stomachaches, and pains	2.63	1.10	.31
6)	I argue and disobey my parents and teachers	1.65	1.01	.53
7)	I lie, cheat or break rules at home, school and elsewhere	1.77	1.05	.59
8)	I steal things	1.31	.77	.27
9)	I destroy things when angry	2.10	1.20	.39
10)	I get into fights and use abusive language	1.61	.99	.59

### Exploratory Factor Analysis

Principal component analysis of polychoric correlations for the 10 items of BPS was conducted. Two components were extracted by the PCA. Cattell's (1966) scree test was employed to determine the number of components to extract (see figure 1 & 2). The first component accounted for 24% of the common variance and the second component accounted for 22% of the common variance. The eigenvalue for the first component was 2.41 and the eigenvalue for the second component was 2.29. All the 10 items loaded significantly (see Table No.2).



**Fig. 1 Scree plot**

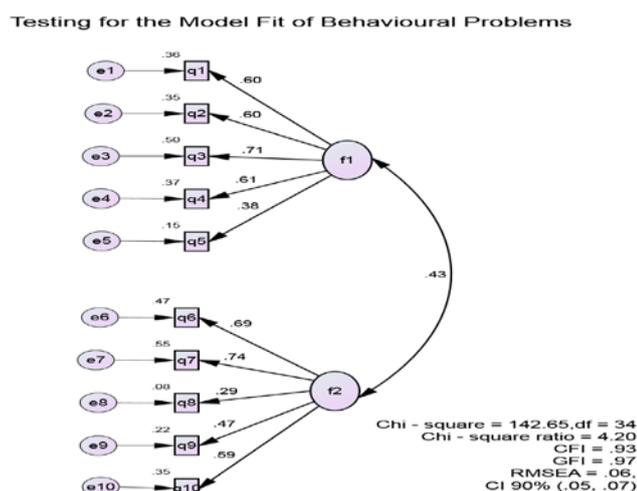
**Table No.2 Component matrix showing eigenvalues and component loadings**

Components	1	2
<i>Eigenvalues</i>	2.41	2.29
Items	Loadings	
1	.71	.00
2	.63	.13
3	.75	.07
4	.70	.01
5	.57	.01
6	.11	.70
7	.11	.74
8	.15	.53
9	.17	.54
10	.07	.78

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### Confirmatory Factor Analysis

Confirmatory factor analysis (CFA), using AMOS 20.0, was used to evaluate the adequacy of the two-dimensional structural model of behavioural problems as measured by BPS. Model fit may be assessed through a combination of parameter investigations (all parameters should be within acceptable values). In this study, we used standard indices and cut-off values to evaluate fit: the Root Means Square Error of Approximations (RMSEA < .08), and the Goodness-of-Fit Index (GFI > .90) and Comparative Fit Index (CFI > .90) (see Kline, 1998), as measures of model fit, with all parameters estimated using the maximum likelihood procedure. The model provided a better fit to the data for the two-dimensional structural model,  $\chi^2(34) = 142.65$ , Ratio = 4.20, CFI = .93, GFI = .97, RMSEA = .06 (see figure 3).



**Fig. 3 CFA Model**

### Convergent Validity

Convergent Validity was examined by examining correlation between constructs related to behavioural problems. The correlations between the BPS and BPM, BDI, and BAI were examined. As is shown in Table 3, all the correlations were found significant.

**Table No.3 Summary of Validity Results for the Behavioural Problems Measure**

Scale	Type	Measurement	Correlation Coefficient
Externalizing Problems Subscale	Convergent Validity	Brief Problem Monitor-YF ( $\alpha = .81$ )	$r = .67^{***}$ , $n = 286$
Internalizing Problems Subscale		Brief Problem Monitor-YF ( $\alpha = .81$ )	$r = .65^{***}$ , $n = 286$
		Beck Depression Inventory ( $\alpha = .87$ )	$r = .49^{***}$ , $n = 271$
		Beck Anxiety Inventory ( $\alpha = .83$ )	$r = .41^{***}$ , $n = 271$
Behavioural Problem Scale		Brief Problem Monitor-YF ( $\alpha = .81$ )	$r = .73^{***}$ , $n = 286$

\*\*\*  $p < .001$ .

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### Reliability

Cronbach's Alpha coefficient was computed to examine the internal consistency. Internal consistency, which examines the average inter-item relationship of the items of any scale, is very important as it measures the degree to which the items are related to each other. According to Peat et al. (as cited in Rahim, et al., 2013), a cut-off alpha value above 0.70 is considered good in the field of social science. The Cronbach's alpha ( $\alpha$ ) of the 10 items of BPS was found to be 0.79 and for sub-scales namely IP .77 and EP .73 (see Table 3). In sum, the BPS demonstrated satisfactory psychometric properties in terms of both reliability and validity.

## DISCUSSION

The Behavioural Problems Scale (BPS) was developed in order to assess the behavioural problems posited to be comprised of two categories Internalizing behavioural problems and Externalizing behavioural problems. For the purpose, a draft of 18 items was formulated. The 10 items were finally selected.

To assess the factor structure, EFA using PCA was applied. Two components were extracted by the PCA. Oblique rotation was applied. Confirmatory factor analysis was applied to test the model fit. With respect to the convergent validity, BPS was significantly correlated with BPM-YF, BDI, and BAI. The internal consistency in the scores of the BPS was found good. The BPS thus appears to have value as a research instrument. The BPS is a brief and easy to administer tool. The BPS can prove useful for research purposes.

BEHAVIOURAL PROBLEMS SCALE (BPS)						
		1	2	3	4	5
INTERNALIZING PROBLEMS (IP)	1. I feel sad	never	rarely	sometimes	often	most often
	2. I feel my life is not worth living	never	rarely	sometimes	often	most often
	3. I cry, get irritable or annoyed	never	rarely	sometimes	often	most often
	4. I am fearful, anxious or worried	never	rarely	sometimes	often	most often
	5. I feel sick or have headaches, stomachaches and pains	never	rarely	sometimes	often	most often
EXTERNALIZING PROBLEMS (EP)	6. I argue and disobey my parents and teachers	never	rarely	sometimes	often	most often
	7. I lie, cheat, or break rules at home, school and elsewhere	never	rarely	sometimes	often	most often
	8. I steal things	never	rarely	sometimes	often	most often
	9. I destroy things when angry	never	rarely	sometimes	often	most often
	10. I get into fights and use abusive language	never	rarely	sometimes	often	most often

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