Basic Psychometric Properties of the Preschool and Kindergarten Behavior Scales in a Sample of Iranian Children

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Abstract

This study was aimed to determine the basic psychometric properties of Preschool and Kindergarten Behavior Scales (PKBS, Merrell, 2002) in a sample of Iranian children aged 4-6-years (402 children of both sexes). Results show internal consistency of scores on social skills (.87) and problem behavior (.92) scales. An exploratory factor analysis was performed using a varimax rotation. Five factors were extracted in the social skills scale: (1) social interaction, (2) social cooperation, (3) social participation, (4) social independence, (5) self-control/social convention and six factors were extracted in the problem behavior scale: (1) attention problems/overactive, (2) antisocial/aggressive, (3) social withdrawal, (4) self-centered, (5) hypersensitivity, (6) anxiety/somatic problems.

Keywords: social skills, problem behavior, preschoolers, psychometric properties

1. Introduction

Educational psychologists believe that most of what happens in early childhood has effects on a child’s growth (Campbell, 1997; Egeland, Kalkoske, Gottesman, & Erickson, 1990; Stanton, Justice, Skibbe, & Grant, 2007). Psychological studies on early childhood development indicates that the ages between 3 to 6 is the stage of forming character, senses and imagination (Achenbach & Rescorla, 2001; Gresham & Elliott, 1990; Merrell, 2002; Reynolds & Kamphause, 2004). Identification of the talents, skills and behavior problems of children in this period is based on qualitative standards. The results of these evaluations will be helpful for children and their families and in a broader level, for the society. This will enable better guidance in educating children and make them active members of society, play stable professional roles and become good citizens.

Assessment of young children is crucial in meeting a variety of purposes. It provides information with which caregivers and teachers can better understand individual children’s developmental progress, status and on how well they are learning, and provide inputs for informed caregiving, instruction, and provision of needed services. It helps early childhood program staff to determine how well they are meeting their objectives set for the children that they serve, and it informs program design and implementation. It provides some of the information needed for program accountability and contributes to advancing the knowledge of child development (Snow & Hemel, 2008).

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Assessment of social skills and behavioral problems of children and adolescents has been a topic of strong interest in the fields of education and psychology since the 1970s (Holland, Gimpel, & Merrell, 1998). From a behavioral perspective, initiation of social skills increases the probability of reinforcement and decreases the probability of punishment or extinction based on one's social behavior. For children, types of behavioral dimensions representing social skills include academic and task related competence, cooperation with peers, reinforcement of peers' behavior, and social initiation behaviors. Peer relations are often thought of as results or products of one's social skills (Merrell & Gimpel, 1998), because good social skills usually result in good relations with peers. This view is reasonable because social reputation and the quality of one's social relations are often a result of how effectively one interacts socially with peers (Landau & Milich, 1990; Oden & Asher, 1977).

Developmental psychopathologists argued that child behavioral and emotional disorders can be divided into two broad classes or dimensions-internalizing and externalizing problems (Cicchetti & Toth, 1991). These two behavioral dimensions have been referred to as over-controlled and under-controlled dimensions, but the types of problems seen within each of the two dimensions are similar. The internalizing dimension of behavioral and emotional problems includes symptoms of depression, social withdrawal, anxious and inhibited reactions, and the development of somatic problems that appears to be related to inner emotional distress (Merrell, 2001).

The assessment, identification and treatment of children's internalizing symptoms are often overlooked in favor of acknowledging the more obvious acting-out types of behavior. However, overlooking these problems does not result in their diminishment, and if left unidentified and untreated, internalizing disorders may evolve into chronic and debilitating mental health problems.

The externalizing dimension consists of aggressive, defiant, disruptive oppositional, overactive, and acting-out behaviors. The externalizing dimension of problem behavior is more easily observed and pinpointed than the internalizing dimension and it is thus a greater focus of intervention efforts in educational and mental health programs for young children (Merrell, 1996). It is widely understood that externalizing behavioral problems of young children, if left untreated, may evolve into serious conduct problems, disruptive behavior disorders and antisocial and delinquent behaviors (Shaw, Keenan & Vondra, 1994). Social skills and problem behaviors are emphasized in the PKBS.

The best and most widely used behavior rating scales for use with young children include Achenbach's Child Behavior Checklist/Teacher's Report Form cross-informant system (CBCL/TRF; Achenbach & Rescorla, 2000), the preschool parent and teacher rating scale versions of the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992), the 3–5-year-old parent and teacher versions of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), the teacher and parent rating scale version of the Conners Rating Scale (CRS; Conners, 1997).

Many other instruments for preschool- and kindergarten-age children are highly clinical and include items that reflect significant psychopathology or psychiatric symptoms. The CBCL and SSRS are available in a Persian-language version in Iran. Although the PKBS is useful for assessing children with significant behavioral, social, emotional and developmental problems but it focuses on typical, general and routine social competencies and problem behaviors of young children that are commonly manifest in home and school settings.

The need for multiple language versions of tests, questionnaires and surveys is continuously increasing. Therefore, many tests are adapted from one language and culture to another. The influence of culture on measuring the specific psychological construct needs to be explored. For each psychological process or construct is measured in a new cultural population, it is necessary to determine the extent to which it is universal across cultures and if not, to specify the exact differences and make the necessary adjustments (De klerk, 2008).

Therefore, the goal of the present study was to assess the basic psychometric information on the preschool and kindergarten behavior scales (PKBS; Merrell, 2002) in Iranian sample.

2. Method

2.1. Participants

Participants were parents of 402 children (210 boys and 192 girls) aged between 4 and 6 years. 83.3% of the children participants were at the preschool level and 16.7% were at the kindergarten level. The home language of all
children participants was Persian. A range of family socioeconomic levels was present in the sample as children were recruited from preschool and kindergarten centers located in different five geographical districts of Tehran.

2.2. Measures

Preschool and Kindergarten Behavior Scales (PKBS, Merrell, 1994, 2002) is a norm-referenced, standardized rating scale that can be used by parents or teachers to assess social skill and problem behavior levels in preschool- and kindergarten-age children aged 3–6 years. The social skills scale includes items that describe positive social skills that are characteristic of well-adjusted children aged 3–6 years. The problem behavior scale includes items that describe various problem behaviors commonly seen among children in this age group. Research findings presented in the PKBS test manual provide evidence for adequate to excellent psychometric properties. Internal consistency reliability estimates for the social skills and problem behavior scales are .96 and .97, respectively; test–retest reliability estimates at 3-month intervals were found to be .69 and .78.

2.3. Procedure

The PKBS items were translated into Persian by two native Persian-speakers. One had a Master of English and Applied Linguistics degree and the other a Bachelor of English Translation degree. Then for meaning correspondence, the Persian language version was retranslated to English by a native English-speaker who teaches English language in an English language school. Finally, the translators collaborated with the researcher to ensure that the true meaning of the items was preserved in translation. Parents were given the PKBS questionnaires and were asked to have the parent who has the most direct contact with the child to be primarily responsible for completing the forms (resulted in 88.3% mothers, 11.7% fathers).

3. Results

3.1. Internal consistency

The PKBS has been shown to have adequate to excellent psychometric properties. Internal consistency coefficients have all been in the .90 range. Internal consistency of the social skills and problem behavior total scores of the Persian version of the PKBS was estimated using Cronbach's alpha coefficient method. For the Persian version, the resulting internal consistency reliability coefficients were .87 for the social skills items (scale A), and .92 for the problem behavior items (scale B).

3.2. Factor structure

The factor structure of the Persian version of PKBS was investigated and developed by using an exploratory factor analysis. Varimax rotation method was used during the exploratory factor analysis. For the final factor solution of the social skills scale, the varimax rotation converged in 35 iterations, producing five factors. The first factor, consisting of 11 items, accounted for 20.7% of the variance (eigenvalue = 6.63) and was labeled social interaction. The second factor, consisting of nine items, accounted for 9.2 % of the variance (eigenvalue = 2.96) and was labeled social cooperation. The third factor, consisting of four items, accounted for 5.4 % of the variance (eigenvalue = 1.71) and was labeled social participation. The fourth factor, consisting of five items, accounted for 4.8 % of the variance (eigenvalue = 1.52) and was labeled social independence. The fifth factor, consisting of three items, accounted for 3.9 % of the variance (eigenvalue = 1.25) and was labeled self-control / social convention. Two items were dropped from the social skills scale, following the final factor solution, because of lack of specificity and weak factor load (lower than .30). Each of the remaining 32 items had loading on to their respective factors of .40 or higher, and only two items had cross loading on to three factors at .30 or higher, and 12 items had cross loading on to two factors at .32 or higher. The factor structure of the items in the social skills scale is presented in Table 1.
Table 1. Factor structure of social skills scale in the Persian version of the PKBS

| Items                                                                 | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|-----------------------------------------------------------------------|----------|----------|----------|----------|----------|
| 5 Tries to understand another child's behavior                        | .494     |          |          |          |          |
| 16 Sits and listen when stories are being read                        | .367     |          |          |          |          |
| 19 Has skills or abilities that are admired by peers                  | .367     |          |          |          |          |
| 20 Comforts other children who are upset                              | .511     |          |          |          |          |
| 25 Shares toys and other belongings                                   | .475     |          |          |          |          |
| 27 Apologizes for accidental behavior that may upset others           | .498     |          |          |          |          |
| 28 Gives in or compromises with peers when appropriate                | .602     |          |          |          |          |
| 30 Takes turns with toys and other objects                            | .495     |          |          |          |          |
| 32 Responds appropriately when corrected                              | .394     |          |          |          |          |
| 33 Is sensitive to adult problems                                     | .561     |          |          |          |          |
| 34 Shows affection for other children                                 | .648     |          |          |          |          |
| 1 Works or plays independently                                        |          | .520     |          |          |          |
| 2 Is cooperative                                                      |          | .439     |          |          |          |
| 6 Is accepted and liked by other children                             |          | .455     |          |          |          |
| 7 Follows instructions from adults                                    |          | .644     |          |          |          |
| 11 Is invited by other children to play                               |          | .410     |          |          |          |
| 12 Uses free time in an acceptable way                                |          | .406     |          |          |          |
| 22 Cleans up his/her messes when asked                                 |          | .675     |          |          |          |
| 23 Follows rules                                                       |          | .628     |          |          |          |
| 29 Accepts decisions made by adults                                   |          | .515     |          |          |          |
| 3 Smiles and laughs with other children                               |          |          | .708     |          |          |
| 4 Plays with several different children                               |          |          | .691     |          |          |
| 9 Makes friends easily                                                |          |          | .682     |          |          |
| 21 Invites other children to play                                     |          |          | .506     |          |          |
| 8 Attempts new tasks before asking for help                           |          |          |          | .563     |          |
| 14 Participates in family or classroom discussions                    |          |          |          | .417     |          |
| 17 Stands up for other children's rights                              |          |          |          | .437     |          |
| 26 Stands up for his/her rights                                       |          |          |          | .645     |          |
| 31 Is confident in social situations                                  |          |          |          | .648     |          |
| 10 Shows self-control                                                 |          |          |          |          | .564     |
| 13 Is able to separate from parent without extreme distress           |          |          |          | .702     |          |
| 18 Adapts well to different environments                              |          |          |          |          | .468     |
| Cronbach’s Alpha                                                      | .68      | .72      | .76      | .75      | .77      |
| Eigenvalue                                                            | 6.63     | 2.96     | 1.71     | 1.52     | 1.25     |
| Percent of Explained Variance                                         | 20.7     | 9.2      | 5.4      | 4.8      | 3.9      |
| Cronbach’s Alpha Total : .87                                         |          |          |          |          |          |
| KMO = .867                                                            |          |          |          |          |          |
| Bartlett Test of Sphericity = 3372.472                                 |          |          |          |          |          |
| ρ = 0.000                                                             |          |          |          |          |          |
Each of the 42 items, on the problem behavior scale, loaded onto their respective factors at .32 or higher. A varimax rotation converged in 14 iterations and produced six factors. The first factor, which accounted for 25.5% of the variance in the analysis (eigenvalue = 10.72), contained eight items and was labeled attention problems / overactive. The second factor, which accounted for 6.4% of the variance (eigenvalue = 2.69) also contained eight items and was labeled antisocial / aggressive. The third factor, which accounted for 4.0% of the variance (eigenvalue = 1.67), contained seven items and was labeled social withdrawal. The fourth factor, which accounted for 3.6% of the variance (eigenvalue = 1.49), contained seven items and was labeled self-centered. The fifth factor, which accounted for 3.5% of the variance (eigenvalue = 1.45) also contained seven items and according to the Quay’s model, was labeled hypersensitivity. The sixth factor, which accounted for 3.2% of the variance (eigenvalue = 1.35), contained five items and was labeled anxiety / somatic problems. In the problem behavior scale, four items had cross loading on to two factors at .31 or higher. The factor structure of the items in the problem behavior scale is presented in Table 2.

Table 2. Factor structure of problem behavior scale in the Persian version of the PKBS

| Items                                                                 | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 |
|-----------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|
| 1 Acts impulsively without thinking                                   | .572     |          |          |          |          |          |
| 6 Makes noises that annoy others                                     | .545     |          |          |          |          |          |
| 10 Will not share                                                     | .638     |          |          |          |          |          |
| 16 Disobeys rules                                                     | .666     |          |          |          |          |          |
| 19 Must have his/her own way                                          | .542     |          |          |          |          |          |
| 20 Is overly active; unable to sit still                              | .591     |          |          |          |          |          |
| 22 Defies parent, teacher, or caregiver                              | .643     |          |          |          |          |          |
| 39 Disrupts ongoing activities                                       | .439     |          |          |          |          |          |
| 3 Teases or makes fun of other children                              |          | .603     |          |          |          |          |
| 21 Seeks revenge against others                                      |          |          | .464     |          |          |          |
| 25 Is restless and fidgety                                           |          |          | .474     |          |          |          |
| 29 Bullies or intimidates other children                              |          |          |          | .656     |          |          |
| 31 Has unpredictable behavior                                        |          |          |          |          | .449     |          |
| 34 Destroys things that belong to others                             |          |          |          |          |          | .606     |
| 35 Is moody or temperamentanmal                                     |          |          |          |          |          | .501     |
| 42 Others and annoys other children                                  |          |          |          |          |          | .719     |
| 4 Does not respond to affection from others                          |          |          |          |          |          | .320     |
| 12 Avoids playing with other children                                |          |          | .694     |          |          |          |
| 17 Has problems making friends                                       |          |          |          | .714     |          |          |
| 24 Resists going to preschool or day care                            |          |          |          | .343     |          |          |
| 27 Is difficult to comfort when upset                                 |          |          |          | .426     |          |          |
| 28 Withdraws from the company of others                              |          |          |          | .768     |          |          |
| 30 Seems unhappy or depressed                                        |          |          |          |          | .441     |          |
| 7 Has temper outbursts or tantrums                                   |          |          |          |          |          | .629     |
| 11 Is physically aggressive                                          |          |          |          | .613     |          |          |
| 13 Yells or screams when angry                                       |          |          |          |          | .636     |          |
| 14 Takes things away from other children                             |          |          |          |          |          | .357     |
| 32 Is jealous of other children                                      |          |          |          |          |          | .399     |
| 40 Tells lies                                                        |          |          |          |          |          | .354     |
| 41 Is easily provoked, has a "short fuse"                            |          |          |          |          |          | .399     |
| 15 Has difficulty concentrating or staying on task                   |          |          |          |          |          | .459     |
| 23 Complains of aches, pain, or sickness                             |          |          |          |          |          | .548     |
| 26 Calls people names                                                |          |          |          |          |          | .350     |
| 33 Acts younger than his/her age                                     |          |          |          |          |          | .366     |
| 36 Is overly sensitive to criticism or scolding                      |          |          |          |          |          | .590     |
| 37 Whines or complains                                              |          |          |          |          |          | .519     |
| 38 Gets taken advantage of by other children                         |          |          |          |          |          | .379     |
| 2 Becomes sick when upset or afraid                                  |          |          |          |          |          | .631     |
| 5 Clings to parent or caregiver                                      |          |          |          |          |          | .383     |
| 8 Wants all the attention                                            |          |          |          |          |          | .373     |
| 9 Is anxious or tense                                                |          |          |          |          |          | .623     |
| 18 Is afraid or fearful                                              |          |          |          |          |          | .550     |
| Cronbach’s Alpha                                                     | .75      | .75      | .77      | .76      | .76      | .78      |
| Eigenvalue                                                            | 10.72    | 2.69     | 1.67     | 1.49     | 1.45     | 1.35     |
| Percent of Explained Variance                                        | 25.5     | 6.4      | 4.0      | 3.6      | 3.5      | 3.2      |
| Cronbach’s Alpha Total                                               | .92      |          |          |          |          |          |
4. Discussion

The Persian version of PKBS showed to have adequate to excellent basic psychometric properties. The internal consistency reliability coefficient was .87 for the social skills scale, and .92 for the problem behavior scale. Thus, the internal consistency of all the versions (English: .84 - .97, Spanish: .93 - .96 and Persian: .87 - .92) of the PKBS was identically strong.

An exploratory factor analysis using principal component analysis with varimax rotation, extracted five factors that accounted for 44.0 % of the variance of the social skills scale. The social skills scale in the original version (Merrell, 2002) and Spanish version (Carney & Merrell, 2002) includes three subscales, but in this study, two additional factors were extracted and according to Caldarella and Merrell’s study (1997) they were labeled as “social participation” and "self-control/social Convention." In the Persian version, some items have a different factor loading when compared with the original version. For example, the item 16 (sits and listens when stories are being read) corresponds to social cooperation in the original version and in this study it is assigned to social interaction. Two items (15, “asks for help from an adult when needed.” 24, “seeks comfort from an adult when hurt”), were dropped from the social skills scale, because of the lack of specificity and weak factor load (lower than .30). Each of the remaining 32 items had loading on to their respective factors of .40 or higher.

In the problem behavior scale, each of the 42 items loaded onto their respective factors at .32 or higher and a varimax rotation produced six factors that accounted for 46.2 % of the variance of the problem behavior scale. The five factors were the same as that of the original version. The factors (1, "attention problems / overactive" 2, "antisocial/aggressive" 4, "self-centered") assigned to externalizing problems and the factors (3, "social withdrawal" 6, "anxiety/somatic problems") were assigned to internalizing problems. One additional factor (5, “hypersensitivity”) was extracted in the Persian version of PKBS. Compared to original version some of the items on the problem behavior scale have different factor loading. In sum, results from this study indicate that the Persian version of PKBS has the same excellent psychometric properties as the anterior versions, but there were some differences between this study and the original version as a result of the linguistic and cultural differences in the target population. According to the International Test Commission Guidelines for Translating and Adapting: “Test developers/publishers should ensure that the adaptation process takes full account of linguistic and cultural differences in the intended populations” (Guideline D1., ITC, 2010).

The current study provides basic psychometric properties of the Persian version of PKBS such as internal consistency and factor structure. Future researchers will do well to conduct other types of reliability and validity studies, such as interrater reliability, test-retest reliability, predictive validity.

The PKBS is a behavior rating scale and like other methods of behavior assessment it is subject to certain limitations, and it is always better to use a combination of methods, across setting, and with a variety of informant sources to help obtain a comprehensive picture of the child’s functioning and to overcome the limitations of any single method, source, or setting (Merrell, 2009).

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