Original Article

Validity and Reliability of Preschool, First and Second Grade Versions of Berkeley Parenting Self-Efficacy Scale

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Objective: The purpose of this study is to examine the factor structure, internal consistency, and construct validity of preschool, first and second grade versions of Berkeley Parenting self-efficacy scale.
Method: The subjects were 317 mothers: (102 mothers of preschool children, 111 mothers of first grade children and 104 mothers of second grade children) who were randomly selected from schools in Tehran. They completed Berkeley parenting self-efficacy and Rotter `s locus of control scales. Factor analysis using the principle component method was used to identify the factor structure of parenting self-efficacy scale. Cronbach`s alpha coefficient was used to identify the reliability of parenting self efficacy scale.
Results: Results of this study indicated that the cronbach`s alpha coefficient was 0.84, 0.87, 0.64 for preschool, first grade and second grade versions respectively. Based on the scree test ,,factor analysis produced two factors of maternal strategy and child outcome, and it also produced the highest level of total variance explained by these 2 factors. The Parenting self-efficacy scale was negatively associated with measure of locus of control(r=-0.54 for the preschool version, -0.64 for the first grade version and -0.54 for the second grade version).
Conclusion: Due to relatively high reliability and validity of preschool, first and second grade versions of Berkeley Parenting Self-Efficacy scale, this scale could be used as a reliable and valid scale in other research areas

Keywords: *parenting self-efficacy scale, validity, reliability, child outcome, maternal strategy*

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Based on the Social Learning Theory, people like to control events that affect their lives. It is important to note that motivations, affective states and actions are based more on our beliefs than on the truth. Thus efficacy beliefs are very important as major resources of actions. Self-efficacy refers to peoples' beliefs about their capabilities to organize and execute actions that are important in accessing a given attainment (1). Efficacy beliefs influence the following factors: course of actions, efforts, and perseverance in face of obstacles and failures, resilience to adversity, stress and depression in taxing situations, and level of accomplishment (1).

Parenting self-efficacy is defined as a feeling of competence in the caregiving role (2). Teti et al defined Maternal self efficacy as a mother`s judgment of how well she can function as a care giver and how she can address specific tasks or challenges related to the parenting role (3).

Over the course of the last several decades, a considerable amount of research attention has been devoted to understanding subjective experiences of parenting. The primary goal of this effort has been to identify key parental cognitions associated with successful personal adjustment in adapting the parental role and positive parenting practice. Early work in this area revealed that women who were able to readily visualize themselves as mothers during pregnancy experienced more successful postpartum adjustments, felt more satisfied with parenting, and exhibited more positive parenting behaviors compared to women who had difficulty doing so. (4,5). Additional longitudinal work has suggested that visualization of oneself as a mother, the beliefs that one possesses, the personal characteristics necessary to become a good parent, and confidence in one's future parenting skills measured late in pregnancy could predict such self-definitions after the child birth (6) as well as various parent–child and child outcomes (7,8). Moreover, maternal perceptions of parenting competence have been found to be more salient predictors of maternal adjustment than prior experience with infants and general self-esteem measures (8).

Many researchers have suggested that parents with high parenting self efficacy are more authoritative and optimistic in their communication with their children than those with lower parenting self-efficacy (9,10).

Thus, parenting self- efficacy has a positive impact on children's development. Findings verified interventions designed to enhance parenting self-efficacy (6,7). After applying these programs, mothers with difficult children interacted more positively with their children, experienced lower level of familial stress and reduced

their children's problematic behaviors (11,12).
To date, four distinct formulations of self-efficacy have been delineated to assess parenting self-efficacy in the literature. First, is the task-specific approach focused on parents` perceptions about their own competency to do discrete tasks within the parenting domain (e.g., identifying physical illness in one`s child (13). The second approach, termed domain-specific, combines data generated with task-specific measure of self-efficacy. Parents may be asked to rate their perception of competence in emotional nurturance and physical care behaviors. Thus, this method is a multidimensional index (9). In the third approach, termed domain-general, parenting self-efficacy is viewed as conceptual expectations that are not linked to particular parenting task. For example, instruments utilizing this approach may examine agreement with statements such as "I am doing a fine job as a parent"(14). Finally, according to several researchers' perspective, general self-efficacy represents a relatively stable personality trait with broad applicability to diverse domains, including parenting (15).
The dominate approach to assess parenting self efficacy is the domain general measure. However, as offered by Bandura, domain-specific measure of self-efficacy is likely to garner more precision in terms of relationship between self-efficacy and actual behavior when compared to more global assessments (9).
Berkeley parenting self-efficacy scales were developed by Holloway, Suzuki, Yamamoto and Mindnich(2000)(16,17). This scale is a domain-specific measure. It is said that these scales were developed because no standardized scale was available to assess parenting self-efficacy for specific child-rearing strategies and specific developmental tasks for parents of young children . An initial pool of items was developed by Holloway et al in a national survey of Japanese mothers which elicited their beliefs and concerns about early childhood socialization (2000). They also consulted an advisory panel of Japanese child development experts (teachers, parent- education specialists and university researchers) about important child-rearing issues of early elementary years for Japanese parents. Based on Holloway et al suggestions, mothers should indicate their sense of parenting self-efficacy in using certain strategies with their children: For example by asking the following questions: How confident do you feel in understanding your child feelings ? How confident do you feel in helping your child to learn each of the following? (17).
Each version has two factors: Child outcome and Parenting self-efficacy. Maternal strategies were designed to elicit self-evaluations related to specific parenting behaviors. Therefore, these items elicited mothers` sense of parenting self-efficacy in certain behaviors towards children (e.g., How confident are you in controlling your emotions in front of your child .(?
Child outcome Berkeley parenting scale makes its evaluations based on the following question: "How confident do you feel in helping your child to learn each of the tasks listed?". This subscale was designed to assess parents` efficacy in supporting children in specific developmental tasks. Parents rate their confidence level for their effectiveness in dealing with children `s cognitive skills and routine social behavior .
Despite the increase in parenting programs, few rigorous evaluations have been undertaken and little attention has been given to the development of a generic outcome measure; thus, there are difficulties in comparing programs directly .
The aim of this study is to examine the reliability (coefficient of coronbach` s alpha) of this scale and to discover whether different questions of parenting self-efficacy measure the same things and if so , whether this variable was measured by the best factor analytic test. Factor analysis is ideal to answer these questions.

Materials and Method

This population-based study was conducted in Tehran (capital of Iran) in 2008. After corresponding via e-mail with composer of the test and reception of three versions of the scale, all the questions were translated and revised. Then, the translated text was back translated, and compared two form. Finally, the translated text was revised and given to professors; and their professional suggestions were included in the translations. For identifying the face validity and initial survey, 30 tests from each version was given to mothers of preschoolers, first grade and second grade children ; and they were asked to identify ambiguous items, and these items were then revised.
Cluster sampling was used in 5 districts in the center, North, West, East and South of Tehran. Each district represented a particular socioeconomic and cultural context of the city`s population. To produce reliable factors, the sample should not only be representative but must also be of sufficient size. Guilford (1956) argued that 200 was a minimum figure but in Kline's experience this figure is pessimistic. In data with a clear structure, a sample of 100 was quite sufficient, but the more subjects the better. Thus, we suppose a sample of 120 subjects per each scale(18.(
Ten clusters (schools) for each scale were selected. Each cluster included 12 preschoolers, 12 first-grade and 12 second grade students. Two clusters (schools) were randomly selected from each district. The selected students were asked to invite their mothers to school. Mothers were given explanations about the questionnaires and then they completed Berkeley Parenting Self-efficacy scale and Rotter's Locus of Control Scale. The estimated sample size was 360 mothers. However, only 317 questionnaires were completed .

Measures

All the participants were examined using the measures below:
Berkeley Parenting Self-efficacy: This scale was developed by Holloway et al(2000)(17).The final

Berkeley Parenting Self-efficacy scale has three versions for preschoolers, first and second grade children. These three versions of Berkeley parenting self-efficacy scale contain 25, 28, 20 questions respectively. Each version has two factors: Child outcome and Parenting self-efficacy. The first 10-items of each version are relevant to parenting strategies and others pertain to child outcome. A 6-point scale was used ; 1 indicated "not confident at all" and 6 indicated "very confident". Mothers` ratings were summed to form a composite score called parenting self-efficacy. Based on Holloway et al`s research, Cronbach's alpha coefficient is high (0.91).

As a validity check on the self-efficacy scale, Japanese mothers were asked to rate the importance of each item (e.g., How important is for you to understand your child's feelings?). The average importance ratings were high for each item, indicating that most mothers viewed children's behaviors as important, M = 5.42, SD = .46; range = 4.82 to 5.78 on a 6-point scale ; this suggests that the self-efficacy scale assesses Japanese mothers sense of competence regarding parenting behaviors that are important to them (16).

Ratter's Locus of Control Scale: The Locus of Control is a 29 item questionnaire developed by Rotter (1966). It measures generalized expectancies for internal versus external control of reinforcement. Individuals with a high internal locus of control believe that events primarily result from their own behaviors and actions. Those with a high external locus of control believe that chance determines events.

Those with a high internal locus of control have better control of their behavior and tend to exhibit more political behaviors than externals and are more likely to attempt to influence other people; they are more likely to assume that their efforts will be successful. They are more active in seeking information and knowledge concerning their situation than externals. The propensity to engage in political behavior is stronger for individuals who have a high internal locus of control than those who have a high external locus of control (19).

The cut-of-point is 12 with the low score indicating "internal control" and high score indicating "external control". Saboorimoghadam has reported 0/81 for splite-half reliability (20).

Data analysis

Data were analyzed using SPSS-11. Factor analysis, internal consistency and coronbach `s alpha were employed for data analysis. Principle factor analysis was a sensible choice in this study. Most computer packages rotate factors with Eigen value greater than 1. However, it has been shown by Cattle (1987) that in large matrices, the number of factors is greatly overestimated (12).However, there is agreement among most factor analysts that Cattel `s scree test is just about the best solution for selecting the number of factors. The cut-off point for factors' rotation is where the line changes slope. In this study, we used Scree test to distinguish the number of factors .

Results

Cronbach's alpha coefficients for all versions are given in Table 1. The alpha coefficients for parenting self-efficacy of preschool, first and second grade versions are 0.84, 0.87 and 0.65, respectively. In general, the Cronbach's alpha coefficients were acceptable for all versions. Only, the total Coronbach`s alpha coefficient of the second version was low (0.64).

Discriminant validity

As expected, the parenting self-efficacy is negatively associated with the measure of locus of control(r=-0.54 for the preschool version, -0.64 for the first grade version and -0.54 for the second grade version). Thus, the pattern and strength of correlations indicated good discriminant and criterion validity.

Factor analysis

table 2 demonstrates the KMO measure of sampling adequacy and Bartelett`s test of Sphericity results. KMO test results are 0.885, 0.861 and 0.895 for mothers of preschoolers, first and second grade children respectively. Therefore, factor analysis yields distinct and reliable factors. For these data, Bartlett `s test is highly significant ($p<0.001$); ,therefore, factor analysis is appropriate.

Preschool versions

As shown in table 3, Based-on Eigen values greater than 1, there are 3 factors. However, the third factor only explains 4.34 of the total variance. In addition, if we check the Scree plot, we will find out that the cut-off point is 2 because the line changes slope after the third factor. First 10-item but three items loaded strongly on second factor. Item 3,4 and 8 loaded on first and second factor. However, the second 15-items loaded strongly on the first factor. Only item 25 loaded on the second factor .

Therefore, it seems that the preschool version has a 2-factorial structure. The most questions loaded on the first and second factors (66.47).

The first factor was named Child outcome and the second factor maternal strategy.

First version

As shown in table5, based-on Eigen values greater than 1, there are 5 factors. However, the third, forth and fifth factors explain 12 percent of the total variance whereas the first 2-factors explain 59.27 percent of the variance. Furthermore, if we check the Scree plot, we will find out that the cut-off point is 2 because the line changes slope after the third factor. Therefore, it seems that the first-grade version has a 2-factorial structure. The most questions were loaded on first and second factors. The second 15-items loaded strongly on first the factor. After confirmatory analysis, the first 10-items loaded strongly on the second factor; only item 3 was strongly loaded on the first factor.. The first factor

was named child outcome and the second factor maternal strategy. It is important to note that these scales have weak construct structure.

Second grade

As shown in table 7, based-on Eigen values greater than 1, there are 3 factors. However, the third factor only explains 5.04 of the total variance. Furthermore, in case we consider the Scree plot, we will discover that the cut-off point is 2 because the line changes slope after the third factor.

Therefore, it seems that the preschool version has a 2-factorial structure. The most questions were loaded on the first and second factors(64.91). The first factor was

Table 1. Reliability (Cronbach Alpha) of three versions of Berkeley parenting Self-Efficacy scale

	Preschool		First school		Second school	
	N	Coronbach `s coefficient	N	Coronbach `s coefficient	N	Coronbach `s coefficient
Total	102	0.84	111	0.87	104	0.64
maternal strategy	102	0.92	111	0.92	104	0.91
Child outcome	102	0.95	111	0.95	104	0.91

Table 2 . KMO and Bartlett`s Test for all versions

Test		preschool	First grade	Second grade
KMO		0.885	0.861	0.895
Bartlett`s test of spericity	Approx.chi Square	2443.270	2656.176	1732.436
	df	300	378	190
	Sig.	0.000	0.000	0.000

Table 3. Total variance explained and Eigenvalue (preschool version)

factors	Eigenvalve	% of variance	Cumulative %
1	11.32	45.30	45.30
2	5.293	21.17	66.47
3	1.089	4.34	70.83

Table 4. Component matrix after varimax rotation (preschool version)

N	Questions	Exploratory analysis			Confirmatory analysis	
		Factors			Factors	
		1	2	3	1	2
1	Listen to your child		0.76			0.83
2	Understand your child` feelings		0.86			0.87
3	Control your emotions in front of your child	-0.44	0.69		-0.44	0.71
4	Avoid over-reacting when your child misbehaves	-0.40	0.47		-0.41	0.55
5	Create a peaceful , happy home		0.73			0.69
6	Set a good example by being polite and respectful to others		0.81			0.80
7	Explain things in a way that your child could understand		0.82			0.74
8	Praise your child when he/she does well		0.92			0.91
9	Discipline your child firmly when he/she misbehaves	-0.44		0.50	-0.44	0.48
10	Let your child know you love him/her		0.88			0.92
11	Respect adults	0.83			0.83	
12	Express thoughts clearly	0.87			0.88	
13	Continue trying even when the task at hand is difficult	0.71			0.71	
14	Figure out what behavior is called for in different settings(e.g., at the park vs. in the library)	0.71			0.72	
15	Be polite (e.g., say "please" and "thank you")	0.83			0.83	
16	How to tell time	0.91			0.91	
17	Avoid bothering others	0.76			0.76	
18	Do things independently	0.83			0.83	
19	Learn the alphabet	0.75			0.75	
20	Get along with other children	0.69			0.69	
21	Get enough exercise	0.83			0.83	
22	Stay neat and clean	0.82			0.82	
23	Eat a variety of nutritious food	0.85			0.85	
24	Avoid swearing or other rude language	0.76			0.76	
25	Be interested in learning new things	0.25		0.72	0.25	0.54

Table 5. Total variance explained and Eigenvalue (first grade version)

Factors	Eigenvalve	% of variance	Cumulative %
1	10.84	38.71	38.71
2	5.75	20.56	57.27
3	1.38	4.95	64.22
4	1.20	4.29	68.51
5	1.11	3.99	72.51

Table 6. Component matrix after varimax rotation(first grade version)

N	Questions	Exploratory analysis factors					Confirmatory analysis factors	
		1	2	3	4	5	1	2
1	Listen to your child		0.84				0.44	0.74
2	Understand your child` feeling		0.85					0.77
3	Control your emotions in front of your child		0.71					0.65
4	Avoid over-reacting when your child misbehaves		0.49			0.56		0.46
5	Create a peaceful , happy home		0.81					0.80
6	Set a good example by being polite and respect others		0.81					0.75
7	Explain things in a way your child could understand		0.88					0.81
8	Praise your child when he/she does well		0.85				0.45	0.72
9	Discipline your child firmly when he/she misbehaves		0.45	-0.53			-0.51	
10	Let your child know you love him/her		0.81					0.75
11	Tell the truth	0.53		0.42			0/69	
12	Finish homework on time	0.70					0.77	
13	Go to bed on time	0.58		0.43			0.70	
14	Eat a healthy lunch at school	0.66					0.65	
15	Complete tasks neatly	0.81					0.72	
16	Get up early enough to get to school on time	0.79					0.76	
17	Don't bet discouraged when your child makes a mistake				0.77		0.52	
18	Do not become over-excited	0.57			0.57		0.72	
19	Behave self without being told to do so	0.75					0.69	
20	Tell your parent when something significant happens in school	0.69		0.40			0.72	
21	Get a long with other children	0.76					0.79	
22	Stand up to peers if you are being mistreated	0.79					0.71	
23	Eat breakfast every day	0.86					0.76	
24	Not bother others	0.70					0.80	
25	Not to be too self-centered	0.40		0.66			0.68	
26	Continue trying when a task at hand is difficult	0.77					0.82	
27	Get ready for school by self	0.64			0.41		0.73	
28	Have a strong sense of self	0.50		0.67			0.66	

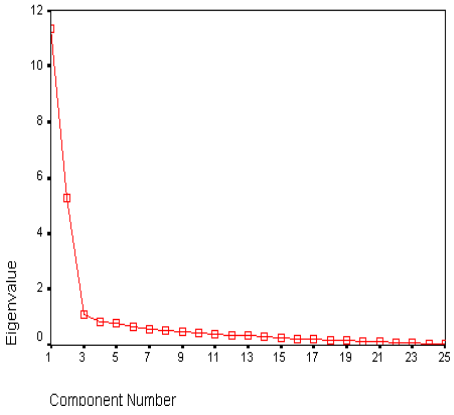

Figure 1- Scree plot of eigenvalue(preschool version)

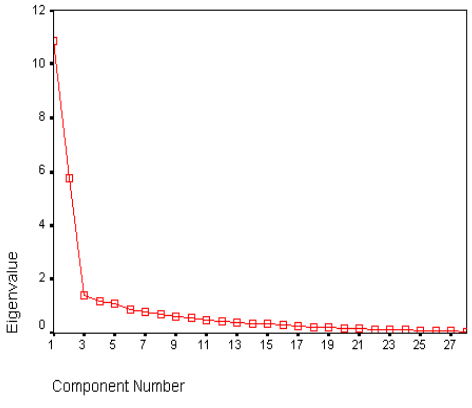

Figure 2. Scree plot of eigenvalue (first grade version)

Table 7. Variance explained and Eigenvalue (second grade version)

factors	Eigenvalve	% of variance	Cumulative %
1	9.25	46.24	46.24
2	3.73	18.67	64.91
3	1.09	5.04	69.96

Table 8. Component matrix after varimax rotation(second grade version)

N	Questions	Exploratory analysis			Confirmatory analysis	
		factors			factors	
		1	2	3	1	2
1	To be an open and honest person		0.75			0.82
2	To complete whatever she/he has been working on even if it is hard		0.73		-0.45	0.75
3	To have a strong will so that she/he is not easily swayed by friends	-0.41	0.60	-0.44	-0.47	0.68
4	To behave well without being told to do so by an adult	-0.49	0.63		-0.51	0.50
5	To finish homework in a timely manner		0.66			0.73
6	To go to bed on time	-0.45	0.72		-0.49	0.68
7	To tell parents when something significant happen at school		0.77			0.68
8	Not to bully other students		0.87			0.90
9	Not to be self-centered when it is obviously inappropriate	-0.49	0.45			0.44
10	To do things neatly and precisely		0.64			0.62
11	Listen to my child	0.80			0.80	
12	Understand my child` feelings	0.88			0.89	
13	Control my emotions in front of my child	0.82			0.83	
14	Avoid over-reacting when my child misbehaves	0.61		0.63	0.65	
15	Create a peaceful , happy home	0.62			0.65	
16	Set a good example by being polite and respectful to others	0.87			0.88	
17	Explain things so that my child will understand	0.82			0.81	
18	Praise my child when he/she does well	0.86			0.86	
19	Discipline my child firmly when he/she misbehaves	0.84			0.84	
20	Let my child know I love him/her		-0.44	0.63	-0.08	0.64

named child outcome and the second maternal strategy.

Discussion

This study is designed to explore the factor structure, internal consistency and construct validity of preschool, and first and second grade versions of Berkeley parenting self-efficacy. In all the cases, the results obtained from the Iranian mothers are the least good. However, this isn't surprising because the tests may not be as effective for populations other than those for whom these tests were designed. Based on Eigen value greater than 1, preschool, first and second grade versions of the scale have 3, 5, 3 factors respectively. Nevertheless, there is agreement among most factor analysts that this way the number of factors will be overestimated. Based on the scree plot, each version were loaded on two factors because the line changes slope after the second factor. Holloway et al did not tested this measure for validity and reliability as they believed that self-efficacy instrument should be developed to fit the particular context in which it is being investigated(16). Holloway et al have found that their surveys work very well with American and Japanese mothers (16, 17, 21).

High reliability of this survey is consistent with Holloway et al `s surveys. They have administrated the surveys three times with the same population in Japan and got high correlation across assessment (test-retest reliability), and they also found very high inter-item reliability for American and Japanese mothers (as reflected in the Coronbach`s alpha) (16, 17, 21).

Current studies generally support the association between high maternal self-efficacy and specific adaptive parenting skills such as responsiveness, and stimulating and non-punitive care giving (22, and a relative absence of Maternal perceived behavioral problems , 23).

The self-efficacy construct refers to beliefs in one`s ability to successfully perform a particular behavior, prerequisite to confidence in one`s capability to effectively engage in a given behavior pursuit in the beliefs that appropriate actions exist that carry the potentially to lead to desired behavioral outcome(15).

Elder (1995) concluded that the evaluated level of parenting self –efficacy serves as a critical buffer against pervasive environment adversity, and enables parents to optimally promote their children `s development(24).

Considering the result of these studies, we could conclude that this scale evaluates parenting self-efficacy because this scale also assesses responsiveness, stimulating, and confidence to parenting strategy.

It is important to note that according to Bandura self-efficacy, instruments should be developed to fit the particular context being investigated (1). Therefore, when using this scale in any given context, verifying the questions' appropriacy with respect to the particular context is recommended.

The results of this study suggest that external locus of control is negatively associated with parenting self-efficacy and, thus internality control is positively associated with it. It is important to note that self-efficacy and locus-of-control are two constructs that are associated with CBT strategies and may be involved in changing individual`s thoughts, behaviors and emotions(25). In general, the relatively high correlation between self-esteem, neuroticism, locus of control and generalized self-efficacy suggest that they may be alternative makers of a single underlying construct (26) ; and it seems that people with internal control have high self-efficacy(26).

Furthermore, in this study the sample size was 120 individuals for each version. Based-on Guilford`s testimony, the sufficient size to produce reliable factors is 200, but in kline`s experience this number is an optimistic one. Considering Kline's remarks, we selected 120 parents for each version. Thus, in clinical tasks this scale should be used with caution.

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