

WCES-2010

Validity and reliability of Turkish form of children's self-efficacy scale on Turkish primary school students

Gülşah Başol^a *

^a*Gaziosmanpaşa University, Faculty of Education, Department of Educational Sciences, Tokat, Turkey*

Received November 2, 2009; revised December 10, 2009; accepted January 18, 2010

Abstract

The study's purpose is to adapt Children's Self-Efficacy Scale to Turkish and search its reliability and validity on a Turkish children's sample. In order to search construct validity, both confirmatory and exploratory factor analysis was applied. The results of EFA indicated that there are three factors explaining 48% variation. Through CFA, null model, two factor model and two-factor excluding Item 19 were compared. The results indicated a better fit for the last model. Criterion validity has been established through significant correlations with a set of scales. Reliability checks were also satisfactory. The results indicated that Turkish form of CSS is a valid and reliable instrument to measure children's self-efficacy levels.

© 2010 Elsevier Ltd. All rights reserved.

Keywords: Self-efficacy in children; validity; reliability.

1. Introduction

Self-efficacy is an important concept in Bandura's Social Cognitive Theory (1977). Self-efficacy is described as one's ability to produce desired outcomes or to execute a specified behavior successfully. According to Self-efficacy beliefs affect a person's choices, resistance, effort, and performance. There is a difference between self-respect and self-efficacy. While self-respect is general sense of well being at doing something, self-efficacy is a sense of well being at a certain topic, class, area of study or in a specific situation. Academic self-efficacy on the other hand is a person's belief on his/her capacity or capability carrying a special task, passing a course, or learning a topic (Sofa, 2006).

2. Commonly Used Self-Efficacy Scales in the Literature

A closer look at the literature on self-efficacy indicates many scales measuring self-efficacy across different age groups, in different occupations and subjects. 57 item Multidimensional Scales of Perceived Self-efficacy was developed by Bandura (1995). Seventeen item Generalized Self-efficacy Scale was developed by Sherer, Maddux,

* Gülşah Başol. Tel.+90 356 2521616 ext. 3412
E-mail address: basol@gop.edu.tr

Mercandance, Prentice-Dunn, Jacobs, and Rogers (1982). The most commonly used self efficacy scale in adults and in adolescents is Generalized Self-efficacy Scale, developed in Germany by Schwarzer and Jerusalem in 1995. The scale was adapted into 26 languages and widely used in many countries. Yeşilay (1996) adapted the scale to Turkish in 1996. Muris (2001) developed a 21 item Self-efficacy Questionnaire for Children (SEQ-C) on a sample of 330 young adolescents. In the current study, Children's Self-efficacy Scale (Martinelli, Bartholomeu, Caliatto, & Sassi, 2009) was adapted to Turkish and then its psychometric properties was studied on a Turkish students' sample.

3. Method

Children's Self-efficacy Scale consists of 20 items, rated on a 5 point Likert Scale. The scale was developed on a Brazilian children's sample by Martinelli, Bartholomeu, Caliatto, and Sassi in 2009. The original sample of the study was 514 children, ages 8 to 11. According to their results, self-efficacy for studying (beliefs related to the ability a person bears to solve activities by his/her own without any help by peers, teacher, or parents) explained 31.25% of the variation in data with 11 items and self-efficacy for academic performance has nine items and as the second factor (related to the self-efficacy for academic performance, informing about child's beliefs about his/her ability to improve or to maintain academic performance) explained 9.29% of the variation. The Cronbach Alpha coefficients ranged from .80 to .83 for the scale and the sub-scales.

In the original study, first the scale is translated to Turkish by the researcher and reviewed by five experts fluent at both languages. Later, it was back translated by two English teachers and the final scale was formed after scale was evaluated by three grade level teachers and their students for its simplicity and appropriateness. The sample of the study was 370 Elementary School students who were enrolled in the 3rd 4th and 5th grade in three public schools in downtown Tokat, Turkey. The measurement package included Children's Self-efficacy Scale, General Self-efficacy Scale, Rosenberg's Self-esteem Scale, Coopersmith Self-esteem Scale and Children's Hope Scale. Of the sample, 161 were male (52%) and 179 (48%) were female. Application of the measurement package lasted for a week, two class hours in each class. Students were informed about purpose of the study and explained that there were no right or wrong answer. In order to measure scale and sub-scales' internal consistencies, Cronbach Alpha Coefficient and Split-half correlations were calculated for the reliability of CASES. For the factor structure of the scale, an exploratory and a confirmatory factor analyses were performed. EFA was carried out through SPSS 15.00 and CFA was conducted through Lisrel 8.54. For the criterion validity of Children's Academic Self-efficacy Scale, the correlations with General Self-efficacy Scale, Rosenberg Self-esteem Scale, Coopersmith Self-efficacy Scale and Children's Hope Scale were examined.

4. Results

4.1. Reliability

For the reliability analysis, two types of internal consistency reliability measures were used in the current study. First of all, Cronbach Alpha coefficients were calculated in order to see the internal consistencies between the scales emerged from the analysis and the total scale scores. According to the results, the scale and subscale had very high internal reliability. Cronbach Alpha coefficients were .89 for the complete scale, .85 for the first factor and .80 for the second factor, respectively. According to the common rule of thumb of .70 (Nunnally & Bernstein, 1994), the analysis indicated satisfactory internal consistencies. Second, the split-half correlation coefficient was calculated and the consistencies of the scores obtained from two halves was found as .82, which was considered high and significant.

The consistencies between the subscale scores also checked through Pearson Product Moments Correlation Coefficients between the scales and the total scale score. The results are provided in Table 1.

Table 1. The correlation between the factors and scale

	First Factor	Total Academic Self-efficacy Score
First Factor		.889**
Second Factor	.632**	.917**

p<.001**

As seen in Table 1, the correlations between the two factors were at medium level in size and significant, while the correlations between the factors and total score were relatively higher than the ones among subscales which expected.

4.2. Validity results

Construct validity was checked through principal component analysis. According to the results, with the highest possible score of five and the lowest of one, the mean value of items ranged from 3.49 to 4.61, standard deviations ranged between .85 and 1.32. The critical value for skewness was 2.0 and 7.0 for the kurtosis; anything above these two values indicates a non-normal distribution (Byrne, 2001). None of the items had a skewness value over two and a kurtosis value above seven. According to these results, it was unlikely to have an inflated Chi-square value caused by a non-normal distribution.

Appropriateness of data for factor analysis was checked with Bartlett's Chi Square test and Kaiser Mayer Olkin Measure of Sample Adequacy was applied to see whether the sample was adequate. The results of the principal component analysis were summarized in Table 2.

Table 2. Results of PCA according to Varimax rotation

Item Number	Factor 1	Factor 2	Factor 3	Communalities	Item-Total Correlations
5	.74	.05	.20	.59	.59
3	.72	.06	.30	.61	.62
1	.67	.16	.01	.47	.53
6	.66	.23	.20	.53	.65
7	.63	.40	.08	.57	.68
2	.56	.20	.08	.36	.52
19	.34	.31	.32	.31	.56
12	.06	.72	.24	.58	.60
18	.07	.68	.07	.47	.51
16	.19	.65	.26	.53	.63
13	.18	.64	.22	.49	.61
17	.25	.64	.14	.49	.62
20	.37	.56	.05	.45	.60
8	.41	.49	.13	.42	.61
10	.43	.46	.28	.48	.68
15	.06	.27	.66	.51	.52
11	.19	.09	.63	.44	.49
9	.32	.20	.50	.39	.55
4	.43	.08	.50	.44	.55
14	-.05	.39	.47	.37	.45
Eigenvalues	6.77	1.69	1.04		
% of variance	33.86	8.43	5.20		
Cumulative %		42.28	47.48		

According to Table 2, 20 items accounted for 47.48% of the total variation in the data. There were three-factors with eigenvalues over one and communalities ranged between .31 and .61.

Through Lisrel 8.54, covariance matrix of the items was analyzed with Maximum Likelihood model. The proposed 2-factor model, another two factor model excluding Item 19, compared with three-factor model that emerged in the exploratory factor analysis. The results can be as seen in Table 3.

Table 3. Results of goodness of fit statistics for models

Model	X ² /df	GFI	AGFI	NNFI	CFI	RMSEA
2-factor	6.45(169)	.91	.88	.63	.67	.054
2-factor, Item 19 deleted	1.73(151)	.93	.91	.96	.97	.044**
3-factor according to EFA results	6.19 (167)	.92	.89	.65	.69	.049**

p<.001**

As can be seen in Table 3, 2-factor model after Item 19 deleted posses a better fit with higher level of confirmation with a X²/df rate less than 5. NNFI and CFI values close to one also points to the perfect fit between data and model. GFI and AGFI values close to one also suggest a good fit. RMSEA of .08 or less also indicate reasonable error of approximation, while values of .05 or less indicate close fit (Byrne, 2001; Hu & Bentler; 1998). The results indicated that the proposed two-factor model with Item 19 deleted provides a reasonable fit to the data with all fit indices close to .80 or above and a RMSEA value less than .05 for reasonable errors of approximation in the population. Therefore, the resulting solution is in agreement with the proposed factor structure of the CASES by its developers. In Figure 1, a path diagram of the two factor solution excluding Item 19 is provided.

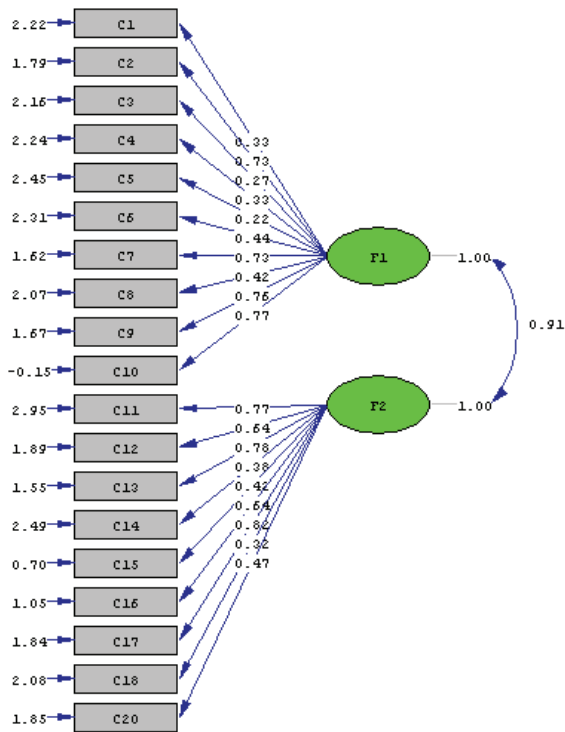


Figure 1. Path diagram of Children’s Self-efficacy Scale two-factor solution-excluding Item19

4.2.2. Criterion validity

Generalized Self-efficacy Scale (Schwarzer & Jerusalem, 1995), Rosenberg’s Self-esteem Scale (Rosenberg, 1965), Coopersmith Self-esteem Scale(Coopersmith, 1967) and Children’s Hope Scale (Snyder, Hoza, Pelham, Radoff, Ware, & Danovsky, 1997) were used in order to establish the criterion validity of Children’s Self-efficacy Scale. The correlation coefficients between CASES and the above given scale are provided in Table 4.

Table 4. Results of criterion validity

	Children's Self-efficacy Scale	Generalized Self-efficacy Scale	Rosenberg Self-esteem Scale	Coopersmith Self-esteem Scale	Children's Hope Scale
Children's Self-efficacy Scale		.385**	.460**	.350**	.487**
Generalized Self-efficacy Scale			.385**	.333**	.375**
Rosenberg Self-esteem Scale				.467**	.476**
Coopersmith Self-esteem Scale					.433**
Children's Hope Scale					

p<.001**

According to Table 4, Children's Hope Scale had the highest correlation with CASES, while the Rosenberg Self-esteem Scale also seemed to correlate almost at the same level. All correlations were relatively small in size but significant at .001 which indicated that CASES has a valid instrument in terms of its criterion with scales in similar topics.

5. Conclusions

The results indicated that the Children's Self-efficacy Scale has indeed two factors, excluding the item 19 that highly correlate with all the items and sub scales of the scale. Finally, it can be said that the Children's Self-efficacy Scale-19 item Revised Form is a valid and reliable instrument for measuring academic self-efficacy among children. Item 19 should need to be rethought and used with some modifications and care if it were chosen to be included. Other than that, the scale seems to be working cross culturally in a Turkish elementary students' sample.

References

- Bandura, A. (1977). *Social learning theory*. New York: General Learning Press.
- Bandura, A. (1995). On rectifying conceptual ecumenism. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research and application* (347-375). New York: Plenum.
- Byrne, B. M. (2001). *Structural equation modeling with Amos: Basic concepts, applications and programming*. Hillsdale, NJ: Erlbaum.
- Hu, L., & Bentler, P.M. (1998). Fit indices in covariance structure modeling: Sensitivity to under parameterized model misspecification. *Psychological Methods*, 3, 424–453.
- Jöreskog, K., & Sörbom, D. (2003). *LISREL VIII: User's reference guide*. Chicago, IL: SSI.
- Martinelli, S.C., Bartholomeu, D., Caliatto, S.G., & Sassi, A.G (2009). Children's Self-Efficacy Scale: Initial psychometric studies. *Journal of Psycho-educational Assessment*, 27, 145-156.
- Muris, P. (2001). A brief questionnaire for measuring self-efficacy in youths. *Journal of Psychopathology and Behavioral Assessment*, 23, 145-149.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs, (35-37). Windsor, UK: NFER-NELSON.
- Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, 51, 663-671.
- Snyder, C. R., Hoza, B., Pelham, W. E., Rapoff, M. Ware, L., Danovsky, M., Highberger, L., Ribinstein, H., & Stahl, K.J. (1997). The development and validation of the Children's Hope Scale. *Journal of Pediatric Psychology*, 22(3), 399-421.
- Sofa, J. (2006). Inspiring academic confidence in the classroom: An investigation of features of classroom experience that contribute to academic self-efficacy of undergraduate women enrolled in gateway courses. Dissertation completed at the University of Wisconsin-Madison.
- Yesilay, A., Schwarzer, R., & Jerusalem, M. (1996). Turkish adaptation of the General Self-efficacy Scale: Genelleştirilmiş özyeti beklentisi. Retrieved from <http://userpage.fu-berlin.de/~health/turk.htm> on October 4, 2009.