

Measures of Aggression in Young Korean Children: A Review of 10 Years of Empirical Research

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Abstract The present study reviewed types of Korean versions of aggression measures for preschool children, which have been used in recent studies of Korea, and then examined the evidence of the reliability and validity of the measures. We also examined gender differences using meta-analysis. Forty six articles, which were published from 2005 through 2014, were selected from scientific databases. Results showed that the PSBS was most frequently used, followed by the PBQ, the CBCL and the SCBE in Korea. Cronbach's alpha ranged between .70 and .97 across measures except one, indicating acceptable levels of internal consistency. The result of the meta-analysis indicated that boys displayed significantly higher aggression. This was consistent in findings of previous studies, stating that boys showed more overt aggression than did girls. However, gender difference in relational aggression was not significant. The results of this study provide information how reliable and valid measures are to researchers aiming to conduct a comparative cultural study involving Korea. In the future, relational aggression will need to be assessed from multiple informants such as peers, teachers, parents, and observers.

Keywords Aggressive Behaviors, Preschool Children, Reliability and Validity, Meta-analysis, Gender Difference

1. Introduction

Aggressive behavior of preschool children has been a popular research topic in many countries [1]. Prior research has shown that aggressive preschoolers, compared to nonaggressive peers, were more likely to experience difficulty in school adjustment and interpersonal interactions [2]. In addition, aggressive preschoolers seem to show maladaptive behaviors and psychopathological problems later in life, such as oppositional defiant disorder and conduct disorder, more frequently than did nonaggressive peers [3, 4]. Thus, it is of greater importance in assessing children's aggressive behaviors in early years.

Previous studies [5, 6] have identified three forms of

aggressive behaviors: physical, verbal, and relational aggression. Physical aggression includes hitting, kicking, biting, and so on, and cursing and name-calling are regarded as verbal aggression. These two forms of aggression are overtly shown in social situations [7, 8]. On the other hand, relational aggression concerns covert behaviors such as social exclusion and spreading rumors intended to harm others' social status and reputation. It has been known that relational aggression is more common in adolescents [9], but a simple form of social exclusion (i.e., rejecting a child repeatedly) can be also observed in preschool play settings

Aggressive behaviors of Korean preschoolers have been commonly evaluated by reports of parents, teachers, and peers in family and school contexts. Due to lack of language fluency, interviews are rarely administered to infants and preschoolers. Instead, observation or behavior rating methods have been used more frequently in examining overt aggression [10]. On the other hand, teachers' reports or peer nominations can be a better way to identify victims or bullies of relational aggression, given the fact that relational manipulation occurs in a less visible way [11].

However, unfortunately, few scales that measure both overt and relational aggression in the preschool period have been standardized into Korean language. Numerous studies on aggressive behaviors of Korean preschoolers have used translated versions of Western scales, yet evidence of reliability and validity of these translations has not been fully examined.

Culturally inappropriate measures lead to biased interpretation of research findings [12]. When administering a measure to participants who speak a different language, items and subscales should be translated to deliver accurate meaning to the participants [13]. Without conducting a back translation procedure, it is hard to determine whether psychometric characteristics of Korean translations are comparable with those represented in the original versions. Researchers in Korea recognize the necessity of contemplating the selection of measurement approaches, but it is rarely mentioned whether researchers translated Korean translations back into English, checking the cultural equivalence between the two language versions. In particular,

it is necessary to check validity and reliability of Korean translations of aggression measures for conducting cross-cultural comparison with other countries.

Three measures seem to have been most commonly used in Korea. The Child Behavior Checklist (CBCL) is a rating scale to evaluate externalizing and internalizing dimensions of behavior problems and is used worldwide [14]. CBCL/4-18 [15] and CBCL/1½-5 and C-TRF [16] are used with preschool-aged children. The Korean-CBCL, standardized by Oh, Lee, Hong, Ha [17], is a translated form of CBCL/4-18. In the form, aggression is one of the subscales of externalizing behavior problems that contains items describing physical attack, talking out of turn, and so on. Parents, caregivers, and teachers (or other relevant observers) rate each item 0, 1 and 2, and ratings from multiple informants are often recommended [18].

The Preschoolers Behavior Questionnaire (PBQ) is also commonly used in Korea as a screening tool for behavioral and emotional problems of 3- to 6-year-olds [19, 20, 21]. Teachers rate 36 items in Hostile–Aggressive, Anxious–Fearful, and Hyperactive–Distractible dimensions from 0 to 2, and identify children into a normal or deviant group. Items in the Hostile–Aggressive dimension are related to physical and verbal aggression such as kicking, hitting, fighting, and blaming others.

Of the measures for aggressive behaviors, Preschool Social Behavior Scale (PSBS) is teacher or peer rating scale that assess relational aggression as well overt aggression [22]. As mentioned earlier, although peer nomination is an effective way to evaluate indirect social aggression [23], the teacher rating questionnaire with a five-point Likert-type scale is more frequently used in Korea. There may be measures to evaluate preschoolers' aggression other than the CBCL, the PBQ, and the PSBS, but no systematic analysis has been conducted. Therefore, the present study investigated what kinds of measures of aggressive behavior have been used in Korea, as well as their evidence of reliability and validity.

In particular, it is noted that aggressive behaviors vary with child gender. It has been known that physical aggression is more common in boys, while relational aggression is more likely related to girls [3, 24]. The high prevalence of relational aggression in girls is especially salient during adolescence, in which peer conformity and popularity become critical components for social competence and school adaptation [25, 26]. However, Smith, Calkins, Keane [27] reported that even children under the age of 3 showed relational aggression. Thus, it is surprising that previous meta-analytic review concluded that gender difference was marginal in relational aggression [28, 29]. Types of aggression measures may affect this finding because, for example, behavioral rating by teachers could be different from that by parents or by peers. For this reason, it would be necessary to examine gender differences in overt and relational aggression according to each type of measure used in Korean studies.

In summary, the present study reviewed types of Korean

versions of aggression measures for preschool children, which have been used in recent articles of Korea, and then tried to find evidence of the reliability of the Korean measures. Then, we conducted meta-analysis to examine whether extent of gender differences depends on each type of measures.

2. Method

Retrieval of studies

In this study, 46 research articles in which aggressive behaviors of 3- to 6-year-old (western age) children were measured were analyzed. These articles, published in South Korea from 2005 to 2014, were selected from a representative scientific databases: Korean studies Information Service System (KISS), Research Information Sharing Service (RISS), DataBase Periodical Information Academic (DBpia) and Kyobo Scholar. The keywords, “aggression” (including “aggressive behavior”), “behavior problems”, “preschooler”, and “kindergartener” were used in the first search. Then, articles that did not specify aggressive subscales from comprehensive behavior problems were excluded.

Exclusion of articles

Only research articles in academic journals were considered, with the exception of theses, books, reports, and essays, among 1005 publications resulting from the search in the first stage. Literature review, qualitative research, case studies, intervention studies, and studies using the measure with an uncertain source or a combination of several measures were also excluded. After the exclusion of the articles whose quality was not properly supported, measures of aggressive behaviors in 46 articles were finally analyzed in this study.

Literature review and meta-analysis of measures of aggressive behaviors

Analyses were made to see what measures were used to assess aggressive behaviors in preschool children and how reliability and validity of the measures were reported in each of the articles. In addition, an attempt was made to identify gender differences by types of aggression. First, evidence of gender difference reported in the 46 articles was reviewed, and then, meta-analysis was performed on the 18 out of 46 articles that report means and standard deviations by gender. Several articles used a scale with fewer items than in the original scale. To control the effect of the difference of the number of items, means were recalculated by division with the suggested number of items and adjusted to reflect the original number of items.

Effect sizes (ES) were estimated by comparing two gender groups on overt and relational aggression. If a 95% confidence interval (CI) include zero, it means the gender difference is not statistically significant. According to the criteria suggested by Cohen [30], ES was considered small

when it was less than .2, medium-sized when it was around .5, and large when it was at least .8. U3, the measure of nonoverlap, was also calculated. Cochran's Q test was performed to indicate statistical significance of heterogeneity of the effect sizes [31]. I2 index over 50% also indicates that the percentage of variations across studies is caused not by change, but by heterogeneity [31]. Thus, the random effect model is required for meta-analysis. Meta-analysis in the present study was performed using the Comprehensive Meta-Analysis V3 program.

3. Results

Overall, six types of measures, which were translated into Korean, were used across the 46 articles (see in Table 1): the PSBS-T, the PBQ, the CBCL, the Social Competence and Behavior Evaluation (SCBE), Child Behavior Scale (CBS), and Social Behavior Rating Scale(SBRS). The PSBS was most frequently used (18 times, 39.1%), followed by the PBQ (12 times, 26.1%), the CBCL (7 times, 15.2%), and the SCBE (5 times, 10.9%). The CBS and the SBRS were used for three times and once respectively.

The CBCL was standardized in Korea, and the Korean-Child Behavior Checklist (K-CBCL) was used across the articles. All other measures were translated by various researchers. The CBCL was rated only by mothers,

and the rest of the measures were rated by teachers. In one article using the PSBS, both mothers and teachers rated children's aggressive behaviors.

Then, the evidence of reliability for each measure was analyzed. In all of the 46 articles, Cronbach's alpha was reported as an index of reliability. Thirteen of the articles using the PSBS (72.2%) and eight of those using the PBQ (66.7%) reported alpha coefficient at or above .90. In six of the articles using the CBCL (85.7%) and in five of those using the SCBE, alpha coefficient at or above .80 were reported. Alpha coefficient was set at .70 or lower in only one article using the PSBS. However, only two articles using the PBQ and the SCBE verified the construct validity through factor analysis, and only one study examined the face validity of the PSBS. None of the 46 studies performed the back-translation process or checked the cultural equivalence.

Concerning gender differences in aggressive behaviors, as shown in Table 1, 18 out of 46 articles reported its significance. Six measures in table 1 contain various types of subscales of aggressive behaviors, but we identified each of them into two categories (overt and relational aggression) for further meta-analysis. In particular, overt aggression category included overt aggression subscale of the PSBS, Hostile-Aggressive subscale of the PBQ, and externalizing behavior problem dimension of the CBCL.

Table 1. Korean versions of the scales measuring preschoolers' aggressive behaviors

Title of measure	Authors of measure	Authors of Korean articles	The number of participants (n)			Reliability in Korean research (Cronbach's alpha)	Gender difference
			By age	By gender	Total		
Preschool Social Behavior Scale -Teacher Form; (PSBS-T)	[24]	[41]	3 years (702)	Boys (353) Girls (349)	702	Total aggression (.86) by teacher report (.88) by mother report	NA
		[42]	4 years (110) 5 years (210)	Boys (153) Girls (167)	320	Overt (.94) Relational (.93)	NA
		[43]	5 years (112)	Boys (56) Girls (56)	112	Overt (.96) Relational (.94)	Boys none
		[44]	4 years (30) 5 years (26)	Boys (32) Girls (24)	56	Overt (.74) Relational (.79)	NA
		[45]	3 years (57) 4 years (156) 5 years (109)	Boys (156) Girls (166)	322	Overt (.97) Relational (.96)	Boys none
		[46]	3 years (90) 4 years (92) 5 years (80)	Boys (130) Girls (132)	262	Overt (.94) Relational (.93)	NA
		[47]	3 years (119) 4 years (58) 5 years (73)	Boys (151) Girls (99)	250	Overt (.91) Relational (.93)	none Boys
		[48]	4 years (124) 5 years (231)	Boys (174) Girls (181)	355	Overt (.94) Relational (.93)	Boys Boys
		[49]	5 years (100)	Boys (51) Girls (49)	100	Overt (.91)	Boys
		[50]	3 years (50) 4 years (51) 5 years (72)	Boys (87) Girls (86)	173	Overt (.92) Relational (.93)	Boys none
		[51]	4 years (106) 5 years (99)	Boys (117) Girls (88)	205	Overt (.61) Relational (.61)	Boys Boys
		[52]	4 years (200)	Boys (111) Girls (89)	200	Overt (.93) Relational (.93)	NA

		[5, 22, 32, 33]	[53]	3-5 years (338)	Boys (176) Girls (162)	338	Total aggression (.85)	NA
			[54]	3 years (356)	Boys (190) Girls (166)	356	Overt (.83) Relational (.92)	NA
			[55]	4 years (55) 5 years (191) 6 years (92)	Boys (175) Girls (163)	338	Overt (.85)	Boys
							Relational (.94)	none
			[56]	5 years (313)	Boys (163) Girls (150)	313	Relational (.94)	NA
			[57]	6 years (86)	Boys (46) Girls (40)	86	Overt (.92)	None
							Relational (.94)	None
			[58]	6 years (126)	Boys (64) Girls (62)	126	Overt (.86)	Boys
Relational (.89)	none							
The Preschooler Behavior Questionnaire (PBQ)		[34]	[59]	5 years (49)	Boys (22) Girls (27)	49	Hostile-Aggressive (.84)	NA
			[60]	3 years (149) 4 years (68)	Boys (108) Girls (109)	217	NA	None
			[61]	5 years (325)	Boys (169) Girls (156)	325	Hostile-Aggressive (.78)	NA
			[62]	3-5 years (357)	Boys (178) Girls (179)	357	Hostile-Aggressive (.92)	NA
			[63]	4 years (578) 5 years (401)	Boys (516) Girls (463)	979	Hostile-Aggressive (.93)	NA
			[19]	4 years (599) 5 years (403)	Boys (528) Girls (474)	1002	Hostile-Aggressive (.94)	Boys
			[20]	5 years (237)	Boys (121) Girls (116)	237	Hostile-Aggressive (.93)	Boys
			[21]	3 years (38) 4 years (92) 5 years (107) 6 years (71)	Boys (166) Girls (142)	308	Hostile-Aggressive (.94)	Boys
			[64]	3 years (42) 4 years (82) 5 years (97)	Boys (118) Girls (103)	221	Hostile-Aggressive (.96)	Boys
			[65]	3 years (38) 4 years (60) 5 years (52)	Boys (88) Girls (62)	150	Hostile-Aggressive (.92)	NA
			[66]	3 years (98) 4 years (102) 5 years (119)	Boys (167) Girls (152)	319	Hostile-Aggressive (.89)	NA
			[67]	5 years (177)	Boys (72) Girls (105)	177	Hostile-Aggressive (.91)	NA
			Child Behavior Checklist (CBCL):	for Ages 1.5-5 years (CBCL 1.5-5)	[35, 36]	[68]	5 years (299)	Boys (153) Girls (146)
[69]	3-5 years (290)	NA				290	Aggressive behavior (.87)	NA
[70]	3 years (113) 4 years (118) 5 years (108)	Boys (191) Girls (148)				339	Externalizing behavior problem (.89)	Boys
							Externalizing behavior problem (.89)	None
for Ages 4-18 years (CBCL 4-18)	[15, 37]	[72]		5 years (150)	NA	150	Aggressive behavior (.87)	NA
		[73]		4 years (88) 5 years (147)	Boys (137) Girls (98)	235	Aggressive behavior (.78)	NA
		[74]		4 years (81) 5 years (216)	Boys (166) Girls (131)	297	Externalizing behavior problem (.85)	NA
Social Competence and Behavior Evaluation : the short form (SCBE-30)		[38, 39]	[75]	4 years (81) 5 years (216)	Boys (166) Girls (131)	297	Anger-Aggression (.83)	NA
			[76]	4-5 years (264)	Boys (128) Girls (136)	264	Anger-Aggression (.91)	NA
			[77]	3 years (41) 4 years (60) 5 years (45)	Boys (82) Girls (64)	146	Anger-Aggression (.90)	NA
			[78]	4 years (81) 5 years (216)	Boys (166) Girls (131)	297	Anger-Aggression (.83)	None

		[79]	4 years (166) 5 years (342)	Boys (276) Girls (232)	508	Relational (.93) Overt (.89)	NA
Child Behavior Scale (CBS)	[40]	[80]	3-5 years (60)	NA	91	Total of child behaviors (.87)	NA
		[81]	3 years (33) 4 years (56) 5 years (30)	Boys (67) Girls (63)	130	Aggression (.89)	NA
		[82]	4 years (108)	Boys (54) Girls (54)	108	Aggression (.86)	NA
Social Behavior Rating Scale (SBRS)	[11]	[83]	3-6 years (110)	Boys (55) Girls (55)	110	Aggression (.90)	None

Note 1: NA = not available(could not be computed from information in original article, and author did not respond to request for information or could not supply it) ; None = not significant.

Note 2: We converted Korean age of participants to western age in each of articles.

Table 2. Statistics for the meta-analysis of each measure

Criterion	K	n of Boys	n of Girls	Effect Size (d)	U ₃ (%)	95% C.I.	Heterogeneity Q	I ²
Total	18	2457	2214	0.389	65.1	0.251 to 0.527	180.941***	85.631
Types of aggression								
Overt	18	2457	2214	0.536	70.4	0.424 to 0.647	48.948***	65.269
Relational	9	1026	879	0.102	54.1	-0.148 to 0.351	59.138***	86.472
The measure of overt aggression								
PSBS	10	1077	990	0.650	74.2	0.496 to 0.804	25.058**	64.084
PBQ	4	920	828	0.487	68.7	0.301 to 0.673	8.972*	66.561
CBCL	2	323	277	0.105	54.2	-0.178 to 0.387	0.001	0.000

Notes: k=the number of articles; Effect size= Small (.2), Medium (.5), Large (.8); U₃=Percentiles of nonoverlap

*p<.05, ** p<.01, ***p<.001

First, thirteen out of 18 articles using the PSBS, the PBQ, and the CBCL showed that boys scored significantly higher than girls did in overt aggression, regardless of types of measures. In studies with the SCBE and the SBRS, boys and girls did not differ in overt aggression. Then, about relational aggression, boys were also more involved in aggressive behaviors than girls were in three articles using PSBS.

Results of meta-analysis on gender difference are presented in Table 2. Sample size of the studies used in meta-analysis was 4671 in total; 2457 boys (52.6%) and 2214 girls (47.4%). In a random effect meta-analysis model (Q = 180.941, p < .001; I² = 85.631), the effect size of gender differences for the total of aggressive behaviors was .389 (C.I.= .251 to .527). The U₃ value of the boy group was 65.1%, which means the effect size of the aggression of boys is 15.1% higher than that of girls.

The variation of effect size was heterogeneous in overt aggression (Q = 48.948, p < .001), but not in relational aggression (Q = 59.138, p = .424). Mean effect size of gender difference was .536 in overt aggression and .102 in relational aggression. Although boys' scores were higher than girls' in both types of aggression, the gender difference was significant only in overt aggression (C.I.= .424 to .647). Gender difference in relational aggression did not reach the significance since the 95% confidence interval included 0 (C.I.= -.148 to .351). The U₃ value (70.4%) in overt aggression indicated that the effect size of the aggression in boys was 20.4% higher than that in girls.

The effect size of the gender differences in overt aggression was .650 in the PSBS and .487 in the PBQ. The U₃ values in the PSBS and the PBQ suggested that boys were more overtly aggressive than girls, while the mean effect size (.105) of the CBCL was not statistically significant.

4. Discussion and Conclusion

This study provided a review of measures of aggressive behaviors, which were used in 46 articles published in Korea over the past ten years. The Korean version of the measures was examined in terms of validity and reliability. This was followed by an examination of differing impacts of gender on aggression for each measure. The results are summarized and discussed as follows:

First, the most frequently applied measures of overt aggression in Korea were the PSBS, followed by the PBQ, the CBCL, the SCBE and the CBS. Only the PSBS assessed relational aggression. While the CBCL was a measure standardized for the Korean population, the rest of the measures were developed by overseas sources. These measures pertain to behavior rating and no observational method has been applied. Only the CBCL was rated by parents, while all other measures were rated by teachers

This implies that research findings on aggressive behaviors in Korea reflect perceptions, opinions, and beliefs

of teachers rather than those of parents. Considering that aggressive behaviors often occur in social interactions [8], it may be difficult for parents to observe children's aggressive behaviors against peers. For this reason, teacher's rating could be an appropriate way to identify both relational and overt types of aggression. However, teacher-child ratios in most of the preschools and kindergartens in Korea were 1:15~30 for classes of children aged 4-5 [84]. Under this circumstance, the level of attention of teachers to detect aggressive behaviors of each child can be questioned. Thus, peer nomination shall be considered in parallel with the teacher's ratings especially for assessing relational aggression.

Secondly, Cronbach's alpha ranged between .70 and .97 for the most used three measures, indicating acceptable levels of internal consistency. This means that the Korean versions of the aggressive behavior measures are quite reliable. However, only a few articles provided the information on the validation.

When a researcher tries to use a measure developed by an overseas source, it is important to revise the original language version due to cultural and language differences [85]. Interpretation of aggressive behaviors is culturally diverse. An aggressive behavior conceptualized in the Western culture may have a different meaning in other cultures [86]. For example, children's taking out of turn in communication can be considered more impolite in the Asian Confusion culture. As a result, such a behavior will be discarded both by other children and adults. Therefore, it is important to develop a valid measure of aggression that reflects the characteristics of Korean culture. Furthermore, cultural equivalence between different language versions of a measure needs to be guaranteed in cross-cultural studies.

Finally, the result of the meta-analysis showed that gender difference depended on the types of aggression. It is found out that boys display significantly higher aggression. This was consistent in the PSBS, the PBQ and the CBCL and confirmed through the findings of previous studies [24, 28], stating that boys showed more physical aggression than did girls. Three articles using the PSBS reported that there were insignificant gender difference in relational aggression, meaning that gender differences in aggression were not significantly related to types of tool.

Previous studies maintained that the female disposition prioritizing relationships with others were associated with relational aggression. However, there has not been clear conclusion as to the question whether preschool girls display more relational aggression. This may be because gender differences in the orientation of social relationships have not been established for young children. A study [9] suggested that female relational aggression would be clearly identified only around school ages and adolescence when children's social cognition develops rapidly. This implies that gender differences in relational aggression may differ by developmental age.

The results of this study provide information how the tools measuring children's aggression are used in other

cultures and how reliable and valid they are. Especially, it will provide preliminary information to researchers aiming to conduct a comparative cultural study involving Korea. In the future, relational aggression will need to be measured from multiple angles with the application of peer nomination and observation in addition to teachers' rating. Also, the age difference, which was not considered in this study, will help to explain gender differences in aggression.

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