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Validating a Measure of Forms and Functions of Aggression in Turkish Adolescents

Rasit AVCI¹

Abstract

This study examined psychometric properties of the Little Aggressive Inventory (LAI), which determines forms and functions of aggression in Turkish adolescents. The study group was 1445 adolescents aged 11–17 (mean age 14.32). Results of confirmatory factor analysis indicated that the model produced a good fit to the Turkish sample. Results showed that boys demonstrated more pure overt and relational aggression than girls. A positive significant correlation between pure-overt and pure-relational aggression, as well as a negative significant correlation between age and instrumental aggression, were found with respect to age. Furthermore, subscales of LAI demonstrated high internal consistency, and results indicated that LAI could separate four areas of aggression -overt, relational, reactive, and instrumental- in the Turkish sample.

Keywords: forms of aggression, functions of aggression, assessment, psychometrics, adolescence.

Introduction

Aggression is a fairly common problem among children and adolescents (Coyne, Archer, & Eslea, 2006), and the risk of children and adolescents resorting to violence and aggressive behavior increase daily (Marcus, 2007). Recent reports from the United States indicate that boys report fighting physically at a rate of 42%, and girls at 28% among adolescents between 14 and 18 years of age (USDHHS, 2006). Similarly 42% of high school students in Turkey were involved in a physical fight that required medical attention within the previous year, and 19% indicated that they were also involved in bullying behavior at school (Alikasifoglu *et al.*, 2004). Research reveals a significant relationship between aggression in children and adolescents (Raine *et al.*, 2006) and later and psychopathology - crime and dating violence (Brendgen *et al.*, 2001). In particular, a

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significant risk factor for adolescents becoming gang members was determined, with proactive aggression as a function of aggression (Ang *et al.*, 2015). Furthermore, drug use, property crimes, and sexual experience have also been associated with proactive aggression (Miller & Lynam, 2006). The consequences of aggression in teenagers thus create a fundamental health problem for society (Connor, 2002). In this context, determinations, restriction/containment evaluations, and treatment for aggressive adolescents are a major problem for many communities.

Dimensions of Aggression

While aggression is multidimensional, with a complex structure, it is defined as behaviors toward harming others (Dodge, Coie, & Lynam, 2006). Finding this definition too simple, some researchers have divided aggression into subcategories to understand aggressiveness better. In this sense, studies examining forms and functions of aggression have been conducted, and more such studies are appearing in the literature (Little *et al.*, 2003; Marse *et al.*, 2011; Vagos *et al.*, 2014; Williford & Boulton, 2013). Research usually tackles overt and relational forms of aggression. Overt aggression, when the other person does not do what is desired, involves verbal and physical behaviors, for instance, threatening, pushing, and hitting the other person (Crick, 1996; Crick *et al.*, 1999; Crick & Grotpeter, 1995). Overt aggression differs from relational aggression particularly because it does not damage relations (Crick *et al.*, 1999). Relational aggression, by contrast, involves deliberate intimidation or manipulation intended to harm others' peer relationships, social status, or reputation (Crick & Grotpeter, 1995). These behaviors can often be direct (e.g., s/he says s/he will not come to his birthday party unless he does what he was told to do) or indirect (e.g., spreading ugly rumors to cause friends to ostracize an individual) (Crick *et al.*, 1999). In relational aggression, the relationship itself is used as a means of damaging; therefore, it is separated from other forms of aggression (Crick, Astrov, & Kawabata, 2007).

Functions of aggression are divided into two categories, hostile or reactive aggression and instrumental aggression, emphasizing the reasons people act aggressively. Reactive aggression can be considered part of the frustration-aggression hypothesis (Berkowitz, 1993). Frustration is perceived mainly as either anger toward provocation or as a defense response. Reactively aggressive behavior proposes retaliation, aiming to hurt the provoking person; therefore, reactive aggression is impulsive (Berkowitz, 1993; Crick *et al.*, 1999). In particular, low frustration tolerance is associated with a tendency to misinterpret controlling emotional responses to provocation and hostile provocation (in ambiguous behavior demonstrated by another party) as weakness (Atkins, Osborne, Bennett, Hess, & Halperin, 2001; Munoz, Frick, Kimonis & Aucoin, 2008; Phillips & Lochman, 2003). Instrumental aggression is based on Social Learning Theory, in which aggressive behavior is learned through operant conditioning or as indirect

learning from a model (Bandura, 1973). Instrumental aggression is a tool used to achieve desired goals (Crick *et al.*, 1999). In this case, a person behaves aggressively to achieve some prize (Williford & Boulton, 2013). In instrumental aggression, a person has positive outcome expectations for the result of performing aggressive acts (Crick & Dodge, 1996).

Aggression Assessment

In the literature, a great number of studies have assessed different dimensions of aggression (Dodge & Coie, 1987; Buss & Warren, 2000). However, these investigations concentrated either on forms or functions of aggression. Little, Jones *et al.*'s (2003) approach of studying forms and functions of aggression, followed by other researchers (Marsee *et al.*, 2011, Vagos *et al.*, 2014) is important for developing a broader conceptualization of subscales of aggression and for planning and implementation of prevention and intervention (Little, Brauner, Jones, Nock, & Hawley, 2003). Therefore, Little, Jones *et al.* (2003) developed the Little Aggressive Inventory (LAI), the first instrument to measure both forms and functions of aggression. LAI differs from other scales in simultaneously measuring aggression forms and functions and in combining both dimensions. In addition, Little, Jones *et al.* (2003) analyzed forms of aggression and examined orthogonal constructs of its reactive and instrumental functions. Such a method identifies both predictions and outputs of aggressive behavior, as measured by Little *et al.* (2003) in a study with German adolescents. Furthermore, the LAI has evaluated pure forms independently of aggression forms. These researchers used confirmatory factor analysis to verify the structure of the scale to test overt, relational, instrumental, and reactive dimensions of aggressive behavior. Results showed that the tested model produced desired goodness of fit [$\chi^2(129, N = 1,723) = 932.0, p < .01; RMSEA = .061; TLI = .95$]. Furthermore, internal consistency for subscales (Cronbach's alpha) was reported to range from .62 to .84.

Studies on LAI's reliability and validity have examined different cultures and samples, and investigations are ongoing. Similarly, in another study conducted by Fite, Stauffacher, Ostrov, and Colder (2008), the scale's factor structure was tested with a small sample of 62 ethnic American children (mean age 12.93). Results were consistent with findings of Little, Jones *et al.* (2003), and the model showed sound goodness of fit [$\chi^2(6, N=69)=14.51, p=.02$]; CFI=.97; SRMR=.05]. The scale's internal consistency (Cronbach's alpha) was reported to range from .76 to .86. Furthermore, while reactive and overt subscales of aggression were positively associated with antisocial behavior, no correlation was found with instrumental and relational aggression. Fite, Stoppelbein, Greening, and Gaertner (2009) examined the model again, in an American, high-risk, clinical population (N = 107; mean age 9.60). The model showed desired goodness of fit [$\chi^2(6) = 15.42, p=.01$];

CFI=.98; SRMR=.04]. Internal consistency for subscales was reported to range from .69 to .93.

Similarly, Williford and Boulton (2013) tested LAI with Latina 8th-grade adolescents (N = 212; mean age 13.50) from low-income families. Results indicated that LAI is a valid and reliable scale for measuring aggression. Results of structural equation modeling (SEM) indicated desired goodness of fit [χ^2 (282.292, N=212) =14.51, $p < .01$]; CFI=.857; TLI = .828; RMSEA = .076; SRMR =.072]. For reliability, the internal consistency coefficient (Cronbach's alpha) ranged from .72 to.82. Studies suggest that LAI is a strong measurement tool, proven reliable and valid with diverse cultures and various populations.

Describing aggression in adolescents is as crucial as determining what causes aggression, which is quite widely seen among adolescents (Coyne *et al.*, 2006), in terms of preventing and eliminating this behavior. Evidence is needed from communities with diverse cultures and behaviors to determine the validity of these models that reveal forms and functions of aggression in other adolescents living on Earth (Vagos *et al.*, 2014). In this way, factors constituting aggression can be more deeply evaluated to understand the psychological interface between culture and aggression (Bond, 2004). Furthermore, uncovering aggression's cultural characteristics might make it possible to develop universal theories for such social behaviors as aggression. In this way, models related to aggression can be expanded by adding measurable cultural conceptualizations (Bond, 2004; Smith & Bond, 2003). As noted above, the validity and reliability of the original LAI was tested on German students in secondary school and various American adolescents (e.g., high-risk adolescents, low-income Latina adolescents). On the other hand, more data are needed from various communities and cultures for this measurement tool and test model.

When studies conducted in Turkey were investigated, the Aggression Questionnaire developed by Buss and Perry (1992) and adapted by Buss and Warren (2000) was found to have often been used in studies conducted with adolescents. This scale has five subscales including physical aggression, verbal aggression, anger, hostility, and indirect aggression. In another recently-conducted study, the Reactive-Proactive Aggression Questionnaire by Raine *et al.* (2006) was adapted by Uz-Bas and Yurdabakan (2012). This scale is used to measure only two aggression functions; thus, measurement tools that simultaneously evaluate both forms and functions of aggression in adolescents are lacking. Consequently, this study intends to determine whether the theoretical structure identified in LAI conforms to Turkish culture and can psychometrically reveal characteristics of ethnic Turkish adolescents.

Methodology

Consistent with the original study (Little, Jones *et al.*, 2003), this research included 1445 adolescents ($M=14.32$, $SD=1.60$), aged from 11 to 17, of whom 769 were female (53.2%, $M=14.40$, $SD=1.58$), and 676 were male (46.8%, $M=14.23$, $SD=1.60$) in eight junior high and four high schools in Mugla Province, Turkey. To ensure a representative sample, variables of the school district, socio-economic status, and gender distribution were considered in the school selection process. The number of junior high school students who participated was 624 (43.2%), while the number of high school students was 821 (56.8%). A total of 1465 students completed questionnaires, but data of 20 students were excluded from analysis because they had too many missing values.

Measures

Little's Aggression Inventory (LAI). In English and German versions, the LAI developed by Little, Jones *et al.* (2003) is a 36-item child self-reported scale that evaluates forms and functions of aggression. It includes six subscales, each with six items. Sub-dimensions are as follows: pure-overt aggression (e.g., "I'm the kind of person who threatens others"); overt-reactive aggression (e.g., "If others make me mad or upset, I often hurt them"); overt-instrumental aggression (e.g., "I often start fights to get what I want"); pure-relational aggression (e.g., "I'm the kind of person who gossips or spreads rumors"); reactive-relational aggression (e.g., "If others upset or hurt me, I often tell my friends to stop liking them"); and instrumental-relational aggression (e.g., "I often tell my friends to stop liking someone to get what I want"). The instrument's 4-point Likert scale has ratings from 1 (not all true) to 4 (completely true). In this study, the scale was rated on 5 points (i.e., 1= not all true 5= completely true). Little, Jones *et al.* (2003) reported that internal consistency coefficients of subscales (standardized Cronbach's α) ranged from .62 to .84. In this study's scope, Cronbach's α value of all subscales ranged from .78 to .89.

Procedure

Necessary permits were obtained from Todd Little to create the Turkish version of LAI. The scale was translated into Turkish by the translation-back-translation method by two faculty members working in the English Teaching Department. Five lecturers from the field of counseling checked how well the translated scale items conformed to Turkish culture. Scale items were re-translated into English by two faculty members in the department of English Teaching. Three experts in counseling and the researcher established the scale's final version from the last revised translation. In the next stage, applications were made to the Mugla Sitki

Kocman University Ethics Committee to obtain permission to include adolescents in research in the school environment.

After researchers received parental permission and permission from the relevant school units, adolescents agreed to participate in the research voluntarily, in collaboration with school counselors. The researcher applied LAI collectively in classrooms in cooperation with the counselors. During the recruiting process, adolescents were assured that their identity would remain confidential and that data obtained would not be used outside this study's scope. The LAI, Turkish Version administration lasted approximately 15 to 20 minutes.

Data Analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS 17.0) and LISREL (8.70). SPSS was used to calculate internal consistency coefficient and descriptive statistics. Construct validity of the measurement instrument was investigated with Confirmatory Factor Analysis (CFA) in the LISREL 8.70 program, which determined that data are not normally distributed. In this context, correlation matrix and asymptotic covariance matrix were used to perform analysis. Robust Maximum Likelihood (ML) was applied as an estimation method. Items have been parceled in pairs, primarily to replicate the model applied by Little, Jones *et al.* (2003). These parcels were used as indicators of latent variables in analyses, instead of subscale items. Furthermore, as specified in the original work, alternative models were examined as follows. Initial analysis was performed on the structure with 18 indicators and eight latent variables (overt; relational; overt-reactive; overt-instrumental, relational-instrumental; relational-reactive; reactive; proactive). Similarly, the six-factor model (overt; relational; overt-reactive; overt-instrumental; relational-instrumental; and relational-reactive) was conducted with six measured structures without second-order CFA. Only two forms of aggression, overt and relational, were used in the two-factor structure. Overt and relational aggressions were combined as one factor in the three-factor model tested.

Variances of instrumental and reactive aggression's latent variables, which are second-order structures, were fixed at 1.0 in the model specification. Correlation values between aggression forms and functions were calculated. Additionally, correlation values between Overt & Reactive, Overt & Instrumental, Relational & Instrumental and Relational & Reactive were fixed at zero, as commonly used in multi-trait-multi-method approaches (Brown, 2006). The most commonly used goodness of fit indexes in Structural Equation Modeling (SEM) to evaluate whether a proposed model complies with data include Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Standardized Root Mean Square Residual (SRMR) (Kline, 2011). Hu and Bentler (1999) suggest that fit indexes of the Standardized Root Mean

Square Residual (SRMR) and Comparative Fit Index (CFI) be used to evaluate models. Furthermore, Non-Normed Fit Index (NFI) and Incremental Fit Index (IFI) were used to assess model fit. CFI indicates to what extent the model measures variance-covariance matrices in the sample. The closer to 1 point, the closer the fit; above $>.90$ is considered best fit. RMSEA is the badness of fit index, and the closer to zero point, the better the fit. SRMR is based on covariance residuals. Zero value indicates perfect fit and high value indicates poor fit. Incremental fit indices (IFI) compare covariance matrices of the proposed model with the independence covariance matrix. While NNFI is a non-normed index, IFI takes the sample size and complexity of the model into account. This fit index ranges from 0 to 1, and 1 indicates perfect fit. Hu and Bentler (1999) suggest cutoff values of NNFI, CFI, SRMR, and RMSEA in the ML method as close to .95, .95, .08, and .06 respectively.

Results

Items of LAI have been parceled in a manner consistent with the original study's work. In this context, correlations, means, and SD values relating to parcels are shown in *Table 1*.

Construct Validity

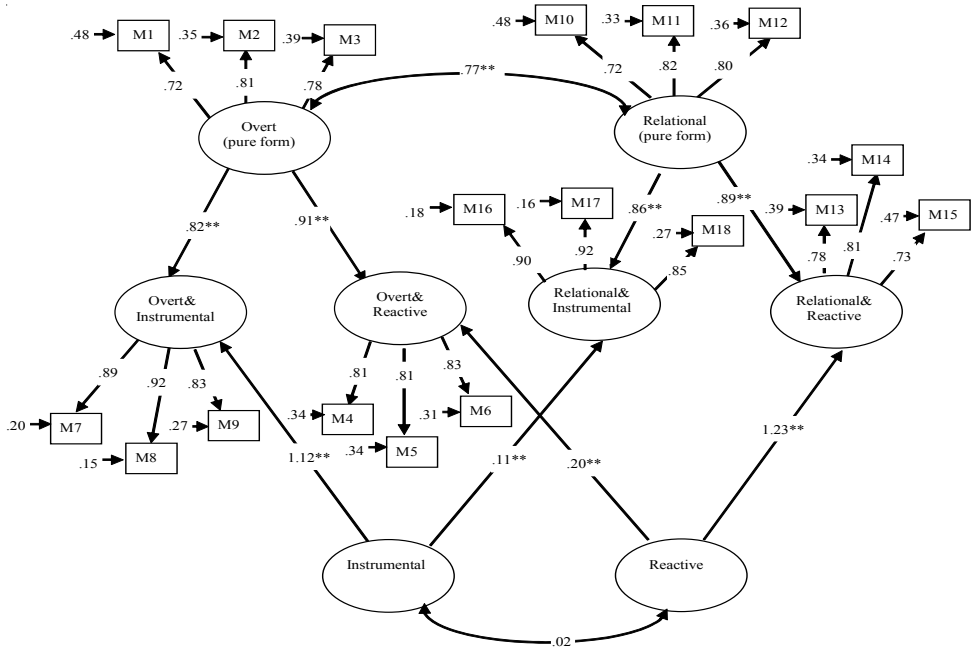
A series of Confirmatory Factor Analyses has been used to examine the construct validity in a manner consistent with the original work. In this context, four different models were tested. Fit index values for two-, three-, six-, and eight-factor models, respectively, are shown in *Table 2*: The eight-factor model seems to produce better fit values ($SB\chi^2/sd$ 463.19/125; RMSEA = .043; CFI = .994; NNFI = .993; IFI = .994; SRMR = .040) than the six-factor model ($SB\chi^2/sd$ 659.13/132; RMSEA = .059; CFI = .991; NNFI = .990; IFI = .991; SRMR = .059), the three-factor model ($SB\chi^2/sd$ 2323/132; RMSEA = .107; CFI = .964; NNFI = .958; IFI = .954; SRMR = .074), and the two-factor model ($SB\chi^2/sd$ 1560.86/134; RMSEA = .086; CFI = .976; NNFI = .974; IFI = .976; SRMR = .069). Standardized Factor Loadings for the eight-factor model are shown in *Figure 1*.

Table 1. Correlations, means, and standard deviations of parcels in LAI, Turkish version

Variable	Parcel	Overt									Relational									
		Pure Form			Instrumental			Reactive			Pure Form			Instrumental			Reactive			
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Overt-Pure Form	1	1																		
	2	.52*	1																	
	3	.41*	.54*	1																
Overt-Reactive	1	.50*	.38*	.36*	1															
	2	.41*	.48*	.39*	.64*	1														
	3	.54*	.46*	.38*	.66*	.62*	1													
Overt-Instrumental	1	.46*	.47*	.54*	.38*	.45*	.47*	1												
	2	.44*	.50*	.49*	.27*	.36*	.39*	.71*	1											
	3	.32*	.49*	.44*	.25*	.39*	.38*	.64*	.68*	1										
Relational-Pure Form	1	.32*	.39*	.31*	.27*	.33*	.33*	.41*	.37*	.41*	1									
	2	.35*	.51*	.43*	.32*	.40*	.38*	.51*	.48*	.52*	.56*	1								
	3	.34*	.48*	.41*	.32*	.34*	.38*	.50*	.47*	.54*	.51*	.63*	1							
Relational-Reactive	1	.31*	.35*	.34*	.39*	.47*	.44*	.38*	.34*	.45*	.43*	.52*	.48*	1						
	2	.27*	.31*	.27*	.39*	.43*	.44*	.31*	.37*	.35*	.41*	.40*	.43*	.59*	1					
	3	.21*	.30*	.21	.31*	.34*	.37*	.34*	.31*	.39	.39*	.40*	.49*	.48*	.59*	1				
Relational-Instrumental	1	.34*	.41*	.37	.23*	.36*	.33*	.54*	.52*	.54*	.55*	.60*	.55*	.51*	.40*	.45*	1			
	2	.36*	.41*	.40*	.26*	.35*	.34*	.54*	.53*	.54*	.55*	.59*	.58*	.49*	.45*	.47*	.75*	1		
	3	.31*	.39*	.39*	.24*	.31*	.34*	.50*	.51*	.50*	.48*	.53*	.60*	.43*	.37*	.50*	.63*	.70*	1	
	M	3.16	2.78	2.51	4.89	3.89	4.21	2.60	2.44	2.63	2.78	2.79	2.78	3.39	3.81	3.58	2.49	2.56	2.59	
	SD	1.67	1.35	1.16	2.51	2.24	2.03	1.33	1.23	1.39	1.45	1.41	1.36	1.75	2.06	1.67	1.27	1.39	1.37	

* $p < .01$

Furthermore, the correlation value between overt and relational aggression forms ($r=.77$) was positive and significant, whilst the correlation value between reactive and instrumental aggression ($r=.02$) was positive yet insignificant.



** $p < .01$

Figure 1. Structural Relations among Aggression Forms and Functions (Standardized Regression Coefficient)

Table 2. Summary of Fit Indices for Each Model of the LAI, Turkish Version

Model	SB χ^2	Sd	p	CFI	NNFI	IFI	RMSEA	SRMR
Two-Factor model	1560.86	134	0.00	.976	.973	.976	.086	.069
Three-Factor model	2323.58	132	0.00	.964	.958	.964	.107	.074
Six-Factor model	659.13	132	0.00	.991	.990	.991	.053	.059
Eight-Factor model	463.19	125	0.00	.994	.993	.994	.043	.040

Note. CFI = Comparative Fit Index; NNFI = Non-Normed Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Values of the model's parameters are displayed in Figure 1, which shows that regression coefficients between reactive aggression and reactive-relational aggression, as well as between instrumental aggression and instrumental-overt aggression produce negative error variances (Heywood case). As here, Heywood cases are often encountered in models that use such analyses (Marsh & Bailey, 1991).

Although some scholars (Byrne, 1998) suggest fixing negative residual variances at zero, no consensus has been reached on whether this is the best option in this case (Savalei & Kolenikov, 2008). In this study, findings were reported with error negative variances by preferring the unconstrained estimation method consistent with previous work (Williford & Boulton, 2013).

External Validity

Gender and Age Differences. In this study, gender and age variables were included in the model to examine relationships between aggression and demographic variables. The extent to which age and gender predict these four dimensions of aggression (overt, relational, reactive, and proactive) are shown in Table 3. Results determined that boys show significantly more aggression than girls in both aggression forms. For aggression functions, there were no significant differences between genders. When relations are examined for the age variable, adolescents indicate more pure-overt and pure-relational aggression compared to those younger, and younger adolescents were found to exhibit more instrumental aggression functions. No significant differences were found in ages for reactive aggression.

Reliability

The internal consistency coefficient of the scale (Cronbach’s alpha) was found to be .79 for pure-overt aggression; .86 for reactive-overt aggression; .89 for instrumental overt aggression; .80 for pure-relational aggression; .78 for reactive-relational aggression, and .88 for instrumental-relational aggression.

Table 3. *Demographic variables’ unique effects on aggression constructs in LAI, Turkish version*

Demographic variable	Form of aggression		Function of aggression	
	Pure overt	Pure relational	Reactive	Instrumental
Gender	.17**	.14**	.03	.04
Age	.24**	.08**	.01	-.12**

Note: ** $p < .01$; The tabled values are standardized latent regression estimates. Age has been used as a continuous variable. For gender, males were coded higher; functions of aggression are independent of forms of aggression.

Discussion

As a result of this study, LAI has emerged as a valid measurement instrument to evaluate aggression forms and functions in Turkish adolescents. Results of confirmatory factor analysis conducted to examine aggression forms and functions indicated that the eight-factor model produced better-fit values than other models. This result reveals the construct validity of the scale and is consistent with the original work (Little, Jones *et al.*, 2003). Similarly, LAI was determined to be consistent with results obtained on different samples (Fite *et al.*, 2008; Fite *et al.*, 2009; Williford & Boulton, 2013). In brief, this scale often used to determine aggression forms and functions in Western countries, could be similarly used for in Turkey.

Correlations between overt and relational latent structures demonstrated a high-level positive correlation between these two structures. This finding is also consistent with findings of Little, Jones *et al.* (2003). Similarly, a high-level positive correlation in two aggression forms was determined in the studies of Fite *et al.* (2008), Fite *et al.* (2009), and Williford and Boulton (2013), which also examine LAI's factor structure. Lansford *et al.* (2012) reported a moderate positive correlation between physical and relational aggression. In this context, Cillessen and Mayeux (2004) and Herrenkohl, Catalano, Hemphill, and Toumbourou (2009) stated that overt and relational aggressions become stable over time. Relational aggression behaviors might increase the likelihood of physical aggression behaviors (Preddy & Fite, 2012).

Positive correlation, although low-level and insignificant, was determined between two aggression functions. This finding is consistent with studies using similar measurement methods in the literature (Fite *et al.*, 2008; Fite *et al.*, 2009; Williford & Boulton, 2013). Fite *et al.* (2008) reported insignificant correlation ($r=-.45$, $p=.11$) between instrumental and reactive aggression dimensions in examining the validity and reliability of LAI. Similarly, Williford and Boulton (2013) reported insignificant correlations ($r=-.09$, $p>.05$) between two aggression functions. Fite *et al.* (2009) also found insignificant correlations ($r=-.03$, $p=.90$) between reactive and instrumental aggression functions. Furthermore, Little, Jones *et al.* (2003) reported trivial-level negative correlations ($r=-.10$, $p<.05$) between these two structures. As a result, these findings indicate that LAI can measure both aggression functions by purifying aggression forms. When this is considered in light of the above information, significant correlation between aggression sub-forms having developmental trajectories provides additional evidence for the validity of aggression sub-forms.

Correlations between aggression forms and functions by gender and age were also examined in this study. Consistent with findings of Little, Jones *et al.* (2003), boys demonstrated more pure-overt and pure-relational aggression than girls. On

the other hand, insignificant correlations between two aggression functions by gender were determined, contrary to findings of Little, Jones *et al.* (2003). Fite *et al.* (2008) reported in a study with American adolescents that boys demonstrated more pure-overt aggression than girls, yet there was no gender difference in functions of pure-relational, reactive, and instrumental aggression. The Turkish study found that boys obtained significantly higher scores than girls in two aggression functions (Uz-Bas & Yurdabakan, 2012). While Tomada and Schneider (1997) reported that in Italy, boys demonstrated more overt and relational aggression forms than girls, Lansford *et al.* (2012) and Putallaz *et al.* (2007) found no significant differences in relational aggression despite boys demonstrating more overt aggression. Underwood (2003) stated that results of studies in the literature are contradictory on girls' relational, social and indirect aggression. Similarly, Smith, Rose, and Schwartz-Mette (2010) obtained mixed results on gender-related differences in aggression. They stated that girls might not be able to demonstrate more overt or relational aggression than boys, yet girls essentially indicated higher likelihood of relational-aggression behavior. However, the finding of even very slightly greater relational aggression in male adolescents, obtained both from this study and Little, Jones *et al.* (2003) contrasts with some studies in the literature. Crick (1996) and Crick and Grotpeter (1995) reported in studies conducted through peer reports that girls exhibited more relational aggression than boys. Card, Stucky, Sawalani, and Little (2008) indicated that gender differences emerged in indirect aggression, including in relational aggression, and occurred with different methods in different measurement processes, such as observation and self- and peer-reports.

On the other hand, as stated by Fite *et al.* (2008), the main reasons for these differences might be cultural. Bornstein, Putnick, and Lansford (2011) stated that countries might differ culturally in terms of values, beliefs, attitudes, and behaviors. In this context, different cultural variables can contribute to aggression and violent behaviors in terms of gender, due to different acculturation processes (Tracy, Kempf-Leonard, & Abramoske-James, 2009). Interest has increased, especially in examining collectivist or interdependent cultures in relationships between culture and different aggression forms (Crick, Ostrov, & Kawabata, 2007). Individualist cultures are usually Western cultures where individuality is at the forefront. Collectivist cultures are those of Japan and Africa, and individuals generally place more value on relationships with others (Markus & Kitayama, 1991). Imamoglu and Gultekin (1993) stated that Turkish culture hosts both collectivistic and individualistic properties (1993). Thus, cultural differences in processing social information in formation of the self are at the forefront, both in the emergence of aggression forms and differences related to aggression functions. In addition, findings especially related to two aggression forms derived from the Turkish culture resemble German culture where Turks were an ethnic minority in the study of Little, Jones *et al.* (2003).

Findings that reveal relationships between aggression forms and age, another demographic variable, indicated a positive correlation with age and overt and relational aggression forms. Little, Jones *et al.* (2003) found a negative correlation only in the pure-relational aggression form with age, yet did not find significant correlations for pure-overt aggression, another subform of aggression, with age. While Fite *et al.* (2008) found a significant positive correlation between pure and overt aggression ($p < .07$) and age in the study on American adolescents, they reported insignificant correlation between age and pure-relational aggression. Crick and Rose (2000) indicated that relational aggression ought to increase with age because peer relationships in adolescents are more complex and romantic relationships are emerging. They stated that the probability of observing and experiencing these behaviors increases with the emergence of romantic relationships. Although overt aggression takes a downward turn after early childhood, chronic aggression in children, especially, continues with puberty (Cote, Vaillancourt, & LeBlanc, 2006). In this context, adolescents continue learning aggression from various models in social learning, such as peers and the media, and they continue overt aggression behavior.

No correlation between age and reactive aggression, along with low, significant negative correlation between age and instrumental aggression, were determined between age and two aggression functions. Little, Jones *et al.* (2003) found no significant correlation between age and two aggression functions. Fite *et al.* (2008) reported insignificant correlation between age and reactive and instrumental aggression functions. Fung, Raine, and Gao (2009) reported in their study on two aggression functions that proactive aggression increased with age, and this increase is lower in reactive aggression. Uz-Bas and Yurdabakan (2012) found an increase between reactive and instrumental aggression and grade level for both males and females from Grade 4 to Grade 7, along with a slight decrease in Grade 8 in Turkish culture. Results from this study are consistent with the study of Uz-Baş and Yurdabakan (2012) in terms of instrumental aggression and the study of Fite *et al.* (2008) in terms of reactive aggression, yet contrasts with other studies (Fung, Raine, & Gao, 2009; Little, Jones *et al.*, 2003). Thus, both age-related difference and gender-related information contain differences between cultures. Fite *et al.* (2008) and Kawabata, Crick, and Hamaguchi (2012) stated that further studies are needed to obtain more solid information on these matters. A similar comment can be made on this study's results.

Finally, Cronbach's alpha internal consistency coefficients calculated on aggression subscales indicated that LAI is reliable. This finding is consistent with the original work (Little, Jones *et al.*, 2003). Similarly Fite *et al.* (2008) found internal consistency ranged from .76 to .86, Fite *et al.* (2009) found it ranged from .69 to .93, and Williford and Boulton (2013) found it ranged from .72 to .82. Results obtained from this study are consistent with other studies, indicating that the scale is reliable. Therefore, the LAI, its validity and reliability having been tested with

German and American adolescents, is also a valid and reliable instrument for Turkish adolescents; forms and functions of aggression have shown a similar structure for Turkish culture.

Study Limitations and Future Direction

This study has some limitations. First, it was conducted on a school-based community sample. Further studies are needed to ensure generalizability of these findings on both school-based community samples and high-risk clinical samples of Turkish adolescents. Similarly, a replication study of LAI can be performed with data obtained from informants such as teachers, parents, peers, and observers. Second, relationships between subscales of aggression and emotional and social affairs were not examined in this study. Further studies can examine relationship subscales of aggression and emotional and social affairs. Furthermore, excluding examination of students' ethnic origins is another limitation. Thus, further studies might examine whether ethnicity predicts subscales of aggression in the model. In addition, the validity and reliability of LAI was examined in German, American, and Turkish societies. Future studies can be conducted either as comparative or cross-cultural. This study's findings reveal, in particular, relationships between aggression forms and gender contradictory to the literature, and information on this topic in the existing literature seems to be contradictory as well. Further information is needed to understand forms and functions of aggression by gender. This information is particularly important for intervention programs treating aggressive behavior. Besides, longitudinal studies can be conducted to understand better the social-cognitive and developmental aspects of aggression.

Implications for Prevention and Intervention

This study proves that LAI could be used in future studies to examine both forms and functions of aggression. Both practitioners and researchers can use the scale. Researchers might assist in the development of theoretical knowledge, collecting more information about forms and functions of aggression in both clinical and normal populations. Practitioners might assist in selecting overcoming-aggression intervention programs for adolescents, identifying what form of aggression appears in which function. For instance, programs that predominantly consist of issues related to learning emotional control, such as anger management, can be implemented for adolescents with high reactive aggression in schools or other application fields dealing with adolescents. Conversely, programs emphasizing such issues as sensitivity training can be used for adolescents with higher proactive function to help them understand consequences of negative actions. This way, better results in dealing with all forms and functions of aggression in adolescents can be achieved.

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