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Validity and Reliability of the Reactive-Proactive Aggression Questionnaire in Turkish Adolescents

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The aim of this study was to adapt the Reactive-Proactive Aggression Questionnaire (RPQ), developed to measure two dimensions of aggression which are reactive and proactive, to Turkish and test the validity and reliability of the Turkish form. The study group consisted of 278 students in four junior high schools in Adana, Turkey, and 485 students in four high schools in Hatay, Turkey. One-factor and two-factor models were compared in the study of Confirmatory Factor Analysis conducted to examine the construct validity of the scale and the two-factor model was found to have better fit values for both junior high school and high school students, as well as the general study group as a whole. It was found that reactive and proactive aggressions have significant relations with attitude towards violence, trait anger, delinquency, deviant peers, anxiety, depression and hostility. Furthermore, it was determined that the scale has high internal consistency and item-total correlation. The results obtained in this study are consistent with the results of the original form of the scale. Findings of the study demonstrate that the Turkish version of RPQ has adequate reliability and validity values.

Key words: Reactive aggression, proactive aggression, adolescents, scale adaptation.

INTRODUCTION

Aggression, which is a serious and common problem in childhood and adolescence (Flannery et al., 2003), is an important risk factor for various antisocial behaviors such as delinquency and behavioral problems (Cima and Raine, 2009). Numerous studies in the literature indicate the relationship between childhood aggression and depression, anxiety, suicide and substance use in later years (Fite et al., 2008a; Zahn-Waxler et al., 2005). Considering crucial social, psychological, health and economic consequences of violence and aggression behaviors (Gentile and Gilling, 2012), it is essential to make efforts in order to understand, treat and prevent aggressive behaviors in children and adolescents. Aggression is a heterogeneous structure with different

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sub-dimensions. Whilst aggression has fairly different classifications, many researchers indicate two different forms of aggression, they are reactive and proactive (Baron and Richardson, 1994; Mayberry and Espelage, 2007; Fite et al., 2012). Reactive aggression is defensive and retaliatory in nature and describes the form of aggression as a response to hostile behaviors or behaviors perceived as intentionally provocative. On the other hand, proactive aggression is a relaxed, deliberate, self-serving and goal-oriented form of aggression (Hubbard et al., 2010).

Marsee and Frick (2007) emphasize that reactive and proactive aggression forms have different structures, which are cognitive and emotional. Reactive aggression contains reactions of defense and retaliation towards threat or provocation (Dodge, 1991; Dodge and Schwarthz, 1997), which includes actions carried out with negative emotions such as anger or frustration (Miller and Lynam, 2006). Usually this form of aggression starts with a feeling of anger. A child hitting or pushing another child who had previously hit him can be given as an example of reactive aggression. Berkowitz (1989) explains this form of aggression using the model of frustration. According to this model, frustration leads to aggressive behavior. Frustrations are displeasing situations and these situations lead to the emergence of negative emotions and aggressive actions. An unexpected failure experienced in achieving a desired purpose is of more discomfort than an expected failure and therefore stimulate aggression more (Crick and Dodge, 1996). These increased negative emotions may lead to an increase in aggressive behaviors for the purpose of self-defense or damaging the source that forms frustration (Polman et al., 2007).

According to the social information progressing approach, reactive and proactive aggression stems from deficiencies and distortions in different stages of information processing. Reactive aggressors tend to misunderstand social stimulus and non-obvious behaviors of their peers and attribute hostile intentions to these behaviors. A kid who understands someone's behavior to be performed intentionally to harm himself reacts aggressively as a reprisal. Here perception of the kid for intention of the person determines whether s/he acts aggressively or not, instead of intention of the person (Crick and Dodge, 1996; Dodge and Coie, 1987). Indeed, research indicates that reactive aggressive individuals display high levels of anger and impulsivity (Miller and Lynam, 2006), weak psychological accord (Card and Little, 2006; Dodge et al., 1997), weak to encode and process information (Dodge et al., 1997) and are prone to predicted hostility (Walters, 2007).

Proactive aggression is the form of aggression that is unprovoked, deliberately exhibited, goal-oriented and motivated by an expected reward (Dodge, 1991); which, unlike reactive aggression, is not emotionally attributed (Hubbard et al., 2001; Scarpa et al., 2010). For instance, a child hitting a friend to get something he wants can be given as an example of proactive aggression. This form of aggression can be explained by social learning theory (Bandura, 1973, 1983).

According to Bandura's theory, proactive aggression is controlled through reinforcement. Individuals who demonstrate this form of aggression have learned to use violence to achieve the desired purpose or an object. According to the social information processing theory, proactive aggression stems from deficiencies and distortions in decision-making to react stage of information processing. Proactive aggressors expect more positive outcomes from aggressive behaviors than their non-aggressive peers and they feel themselves more component and sufficient in displaying aggressive behaviors. Aggression for these individuals serves as a proper means of achieving their objectives without punishment expectations (Crick and Dodge, 1994). Indeed, research indicates that proactive aggressive individuals have high expectations of positive results (Walters, 2007), and a weak spiritual/moral sense (Cima et al., 2007). Research conducted on children and adolescents indicates that proactive and reactive aggressions are associated with different behavioral outputs. According to research results, reactive aggression is associated with internal symptoms such as negative emotions, anxiety and depression (Card and Little, 2006; Raine et al., 2006; Fite et al., 2009; Vitaro et al., 2002). It was stated that reactive aggression in children and adolescents has a positive relationship with depressive symptoms (McAuliffe et al., 2006) and anxiety (Marsee et al., 2008). Similarly, Dodge et al. (1997) reported that depression of reactive aggressive children is higher than proactive aggressive children. Card and Little (2006) determine in a meta-analytic study that while reactive aggression has a relation with internalizing problems and emotional dysregulation, proactive aggression does not. These overall findings indicate that while emotional difficulties are associated with reactive aggression, they are not associated with proactive aggression.

According to some research results, proactive aggression is associated with delinquent and antisocial behaviors (Fite et al., 2008b; Raine et al., 2006; Scarpa et al., 2010; Vitaro et al., 2006), and psychopathic tendencies (Cornel et al., 1996; Porter et al., 2003; Woodworth and Porter, 2002). Some research indicates that reactive aggression is not directly associated with delinquency (Raine et al., 2006; Vitaro et al., 2006). Card and Little (2006) found in their meta-analytic study that delinquency is associated with both reactive and proactive aggression. Similarly, Conner et al. (2004) identified that disruptive behavior disorders is associated with both reactive and proactive aggression. As a result, the relationship of reactive aggression with internalizing

problems is clear. However, it is difficult to reveal difference of reactive and proactive aggression in terms of behavior problems. Various studies indicate that peer guilt is associated with aggression (Fite and Colder, 2007; Fite et al., 2011).

Research results are not consistent when the relationship of aggression forms with peer guilt. In the literature, there are studies indicating that peer guilt is only associated with proactive aggression (Fite et al., 2007; Fite et al., 2011) or only with reactive aggression (Fite and Colder, 2007; Fite et al., 2010)

Fite and Colder (2007) reported in the study carried out in early adolescence, that delinquent behaviors of their peers increase reactive aggression and vice versa. Similarly, in a longitudinal study, a moderated role was seen in the crime of the perceived best friend among reactive aggression of children with disciplinary offenses (Fite and Rathert et al., 2011). As a result, researches have shown that reactive and proactive aggressions have different properties in children and adolescents. Examining gender and age relationships with reactive and proactive aggression are essential to understand reactive and proactive aggression. A great numbers of studies in the literature indicate that males are more aggressive than girls. However, gender differences in the reactive and proactive aggression are not clear enough. In some studies, it was determined that proactive aggression scores of males are higher than scores of girls, yet no significant gender difference was observed in reactive aggression (Andreu et al., 2009; Fung et al., 2009; Li and Fung, 2015). In other studies, it was determined that both proactive and reactive aggression scores of male are higher than scores of girls (Salmivalli and Nieminen, 2002; Uz Baş and Yurdabakan, 2012). Similar situation is also seen in findings concerning the relationship of reactive and proactive aggression with age. Fung et al. (2009) determined that both proactive and reactive aggression increased with age. However, there are different findings. For instance, Wimsatt et al. (2011) reached the conclusion that while reactive aggression increased with age, proactive aggression is not age-related.

It is crucial to understand aggressive behavior in children and adolescents to know the different forms of aggressive behavior in order to demonstrate effective approaches for prevention and intervention, and to provide specific approaches to different forms of aggression (Raine et al., 2006). Indeed, clinical research indicates that different intervention programs are effective with different forms of aggression (Antonius et al., 2013; Swanson et al., 2008; Walters, et al., 2007). Anger management and social cognitive reconstruction especially with regard to self-attribution biases can be used in studies with reactive aggression. Proactive aggressors can benefit from social cognitive reconstruction progressed for especially negative outcomes of aggressive behaviors (Vitaro et al., 2006).

There are various instruments to measure these two forms of aggression (Dodge and Coie, 1987; Little et al., 2003). One of these is the Reactive-Proactive Aggression Questionnaire (RPQ) developed by Raine et al. (2006). This self-report featured scale can be used with children, adolescents, and young adults. One of the major advantages of this scale is asking individuals questions in general without being limited to a few months. Being a short scale can also be considered as a further advantage. The sum of the two forms of aggression on the scale can be used as a general aggression point at the same time. Psychometric properties of RPQ have been demonstrated by several validity studies. Raine et al. (2006) determined the mean item-total correlations between 0.45 and 0.58 for the reactive scale, and between 0.41 and 0.57 for the proactive scale. Cronbach's alpha values are 0.84 for the reactive scale and 0.86 for the proactive scale. Similar reliability results were obtained in different studies. For instance, Cima et al. (2013) identified Cronbach's alpha 0.83 and 0.87 respectively for reactive and proactive scales and Pechorro et al. (2015) identified Cronbach's alphas as 0.86 and 0.91. The two-factor model has better fit values than the one-factor model, despite the high correlation between the two scales of RPQ (Andreu et al., 2009; Baker et al., 2008; Cima et al., 2013; Pechorro et al., 2015; Raine et al., 2006).

When the importance of cultural influence on aggression is considered (Bergeron and Schneider, 2005; Forbes et al., 2009), achieving the validity of reactive and proactive aggression in different cultural populations would provide further support for this diatomic structure of aggression. There are studies in favor of two-factor model comparing one-factor model of RPQ in many cultures (Cima et al., 2013; Fossati et al., 2009; Fung et al., 2009; Seah and Ang, 2008; Pechorro et al., 2015; Raine et al., 2006). Although, there are studies supporting cross-cultural generalizability of RPQ, there is limited available evidence for the validity of RPQ for the Turkish sample. Only one research (Uz-Baş and Yurdabakan, 2012) conducted in Turkey supports the two-factor structure of RPQ. There have been no studies conducted with a limited age range for convergent or discriminant validity of Turkish RPQ. Further evidence is needed for the validity of RPQ in the Turkish culture.

Therefore, in this current study, translation of RPQ into Turkish was conducted using the translation-back-translation method in order to examine cross-cultural generalizability of RPQ. The scale was conducted with 763 children and adolescents, including both genders. The study intend to identify whether or not the Turkish version of RPQ has the two-factor structure as with other cultures, as well as to examine the relationship with different variables. Also, the study aim to examine the effects of age and gender upon reactive and proactive

aggression.

First, we hypothesized that the two-factor model (reactive-proactive) would indicate a better fit than the one-factor model (general aggression) did in other cultures (Cima et al., 2013; Fossati et al., 2009; Fung et al., 2009; Seah and Ang, 2008; Pechorro et al., 2015; Raine et al., 2006). Second we hypothesized that while reactive aggression is positively associated with trait anger, anxiety, depression and hostility, proactive aggression is not as consistent with earlier studies (Card and Little, 2006; Raine et al., 2006; Fite et al., 2009; Vitaro et al., 2002). Third, we hypothesized that subscales of RPQ are positively associated with delinquent behaviors (Card and Little, 2006), deviant peers (Fite et al., 2010) and attitudes towards violence. Fourth, we hypothesized that males would score higher than females, both in the reactive and proactive forms of aggression (Salmivalli and Nieminen, 2002). Last, we hypothesized that reactive and proactive aggression are greater in higher age adolescents when compared to children and early adolescents (Fung et al., 2009).

METHODS

Participants

The junior high school study group of the research comprised 278 students, with 164 (59%) females and 114 (41%) males aged from 10 to 15 (M = 12.52 Sd = 1.38) from four junior high schools in Adana, Turkey. 67 (21.2%) students of secondary education are fifth grade, 66 (23.7%) students are sixth grade, 74 (26.5%) students are seventh grade and 71 (25.4%) are eighth grade. Annual family income of the students ranged from $4,000 to $40,000 and average income is $6,400. The study group of high school students comprised of 485 students, with 274 (56.5%) females and 211 (43.5%) males aged 12 to 19 (M = 15.94, Sd = 1.17) from four high schools in Antakya, Turkey. When the distribution of students with their class is examined, it can be seen that 120 (24.7%) students are ninth grade, 127 (26.2%) students are 10th grade, 124 (25.6) students are 11th grade and 114 (23.5%) students are 12th grade. Annual family income of the high school study group ranged from $2,000 to $48,000 and average income is $7,500. The combined general study group therefore comprised of 763 students, with 438 (57.4%) females and 325 (42.6%) males aged 10 to 19 (M = 14.69 Sd = 2.08).

Measures

Reactive-proactive aggression (RPQ)

The scale, as developed by Raine et al. (2006), aims to measure reactive and proactive aggression among male adolescents. The 23-item scale calculates a total aggression score, of which 12 items was to calculate reactive aggression (e.g., yelling at others when they have annoyed you), and 11 items to calculate proactive aggression (e.g., had fights with others to show who was on top). Each item is rated using a 3-point Likert-type scale (0=Never, 1=Sometimes, 2=Often). Higher scores obtained from the scale indicate higher levels of aggression. Confirmatory factor analysis was carried out to examine construct validity in the original form of the scale. In this context, both one-factor and two-factor structures of the scale were compared, and the two-factor structure was found to produce better fit values.

Attitudes towards violence scale (ATVS)

This scale was developed by Blevins (2001), and is used to measure the attitudes of students towards violence. It is a one-factor scale that consists of 11 items. Each item is rated on a 4-point Likert-type scale (from 1= strongly disagree, through to 4 = strongly agree). The total scores are obtained by adding up the responses of students to all the items. High scores obtained from the scale indicate high levels of attitudes toward violence The Turkish adaptation of the scale was carried out by Balkıs, Duru and Buluş (2004). The results of the factor analysis conducted to examine construct validity of the ATVS scale indicated that items grouped in one factor were consistent with the original work and explained 36.8% of the variance. The Cronbach's alpha internal consistency coefficient of the scale was found to be 0.74 in the scope of this study.

Deviant peers scale (DPS)

The scale proposed by Galambos and Maggs (1991) was developed in order to determine whether or not adolescents have peers with negative or problematic behaviors. The original form is a 4-item, 4-point Likert-type scale (e.g., "My friends often get in trouble with adults"; with possible answers ranging from 1 = does not suit me at all, through to 4 = suits me completely). The Turkish adaptation of the scale was carried out by Kındap et al. (2008). In addition to the original form of the scale, three more items to measure negative behaviors often mentioned in the literature were added. High scores obtained from the 4-item scale indicate adolescents with deviant peers. Higher scores obtained from the 7-item scale indicate that adolescents have friends with negative or problematic behaviors.

Trait anger and anger expression style scale

The original scale was developed by Spielberger (1983), and the Turkish adaptation was later carried out by Özer (1994). The 34-item scale determines degree of aggression and anger expression styles in adolescents and adults. Each item ranges on a 4-point Likert-type scale (ranging from, 1 = It does not define at all, through to, 4 = It defines entirely). There are four subscales including trait anger, internal anger, external anger, and anger control. A total score cannot be obtained from the scale, yet scores can be calculated for the subscales. The Trait Anger Subscale (TAS, 10 items) of the scale was used in this current study. High scores obtained from the TAS subscale indicate a high degree of anger. Criterion-related validity and factor analysis were performed in the study of the scale adaptation by Özer (1994). The item-total correlations ranged from 0.14 to 0.56 (Özer, 1994). Also, the TAS subscale was applied to a high school study group and the Cronbach's alpha internal consistency coefficient was determined as 0.86.

Delinquency scale (DS)

This scale was developed by Kaner (2002) in order to determine behaviors not recognized by official institutions, yet it would be treated as a crime with adolescents facing criminal charges in court.

The 38-item DS includes nine subscales. Adolescents divide delinquent behaviors into four options on a 4-point Likert-type scale (ranging from 1= never, through to 4 = five or more) regarding frequency of performing such behaviors during the previous six months. Total scores can be obtained from the scale and higher scores indicates higher criminal tendency of adolescents (Delikara, 2002). Construct validity of the scale was examined by factor analysis. The items were grouped into nine factors, with factor loadings ranging from 0.41 to 0.82, which explained 63.7% of the variance. Correlations of subscale scores of the DS with each other ranged from 0.37 to 0.73 and correlations with total score ranged from 0.38 to 0.62. The internal consistency coefficient for the whole scale was determined as 0.92 in this study.

Brief symptom inventory (BSI)

This 53-item self-report inventory was developed by Derogatis (1992) in order to make an overall assessment of psychopathology. The BSI Likert-type scale is the short form of the SCL-90, with items ranged on a 5-point Likert-type scale (from 0 = none, through to 4 = a lot). The Turkish form of BSI was adapted by Şahin and Durak (1994) in three different studies. The Turkish version of BSI includes five subscales and they are anxiety, depression, negative ego, somatization, and hostility. Turkish adaptation of the adolescent form of the scale was later carried out by Şahin et al. (2002) and the five-factor-structure scale was determined. The relationship of trait anxiety, depression, life satisfaction and social comparison scales with subscales of BSI was examined and significant correlation coefficients were determined which ranged from 0.45 to 0.71. Both studies indicate that BSI is a reliable and valid instrument for adolescents and adults. The anxiety, depression and hostility subscales were selected for use in this current study. The internal consistency coefficients of the selected subscales are 0.87, 0.90 and 0.77, respectively.

Procedure

Necessary permissions were obtained from Adrian Raine, the lead author of the original RPQ scale development (Raine, et al., 2006), in order to create the Turkish version. The original English language version of the scale was independently translated into Turkish by five teaching staff fluent in English, of whom three were experts in the area of counseling and two were experts in translation. The translations were examined and compared by the researchers and the most appropriate expressions that represent each item were selected. These expressions were then re-translated back into English by a bilingual member of teaching staff from the area of psychological counseling. Finally, the original form and the obtained form were compared and the scale was finalized. Practices were carried out in the classes identified by the researcher and school psychological counselors after obtaining necessary permissions from the school administration. An average practice took between 15 to 20 min.

Data analysis

The construct validity of the new Turkish RPQ was examined using the confirmatory factor analysis (CFA). CFA was made for categorical variables since the data was scored as 0-1-2. In this context, the analysis of data was conducted through the correlation matrix and the asymptotic covariance matrix. Robust Diagonally Weighted Least Squares (DWLS) were used as the estimation method Finney and Distefano (2013) suggest using robust DWLS estimator method in the cases where number of categories in variables is 5 or below. Furthermore, the eligibility of the number of samples for robust method was calculated by k (k+1)/2 (k= number of variables) formula and the sample was determined to be sufficient for the analysis (Şimşek, 2007). CFA was carried out in LISREL 8.70 statistical program. Also, the one-factor model (general aggression) and two-factor model (reactive and proactive aggression) were compared as regards fit values consistency with the original work (Raine, et al., 2006). In CFA investigation χ^2/sd value, The Akaike Information Criterion (AIC), The Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Non-normed Fit Index (NNFI) and Incremental Fit Index (IFI) indices were used for the comparison of fit values of the models. It is stated that 0.90 and higher indices of GFI, NFI, NNFI, AGFI and IFI indicate a good fit (Byrne, 1998; Tabachnick and Fidell, 2001; Sumer, 2000) as well as 0.06 and lesser indices of RMSEA indicate a good fit (HU and Bentler, 1999). Furthermore, chi-square values were examined in fit values comparison of the models. It is stated that the model indicates a perfect fit in cases where the value of χ^2/sd is less than 2 or 3 (Kline, 2005; Sumer, 2000; Tabachnick and Fidell, 2001).

Paired samples t-test was used to determine whether there is a significant difference between reactive aggression and proactive aggression scores independent sample t test was used to determine the differences between the gender. Correlation values were examined between Attitudes Towards Violence Scale, Deviant Peers Scale, Delinquency Scale, Trait Anger Scale, Brief Symptom Inventory-Depression, Brief Symptom Inventory-Anxiety, Brief Symptom Inventory-Hostility, RPQ total scores and RPQ' subscales for criterion-related validity. In addition, regression analysis was carried out to determine whether RPQ scores were predicted by gender and age. Item-total test score correlation values, Spearman-Brown split-half test reliability, and Cronbach's Alpha internal consistency coefficients were calculated in the context of the reliability of the scale. SPSS 17 package program and LISREL 8.70 program were used for the analyses.

RESULTS

Construct validity

One-factor structure (general aggression) and two-factor structure (reactive and proactive) were compared regarding fit values in the confirmatory factor analysis conducted to examine construct validity; the results of which are shown in Table 1. As can be seen in Table 1, when values from each study group and the general study group were examined, the one-factor model decline was observed in χ^2/sd rate and RMSEA value was found above 0.05. In this case, it can be said that the model produces a perfect fit (Sümer, 2000). Similarly, lower AIC (Akaike's Information Criterion) value was observed in the two-factor model (Table 1). In addition, when other fit indices were investigated, the two-factor model produces better fit values. Therefore, the two-factor model was found to provide better fit values.

When standardized coefficients of the items related to reactive aggression factor were examined, they were found to range from 0.59 to 0.81 for the junior high school, from 0.55 to 0.75 for high school, and from 0.56

Table 1. Fit values for one-factor and two-factor models.

Variables	Model	χ^2	df	AIC	GFI	AGFI	NFI	NNFI	IFI	RMSEA
Junior High School Study Group (N=278)	One-factor (General Aggression)	456.39	230	548.39	0.97	0.97	0.97	0.98	0.99	0.060
	Two-factor (Reactive & Proactive)	356.23	229	450.23	0.98	0.98	0.98	0.99	0.99	0.045
High School Study Group (N=485)	One-factor (General Aggression)	755.75	230	847.75	0.96	0.95	0.97	0.97	0.98	0.069
	Two-factor (Reactive & Proactive)	408.32	229	502.32	0.97	0.96	0.98	0.99	0.99	0.040
General Study Group (N=763)	One-factor (General Aggression)	905.70	230	997.70	0.97	0.96	0.98	0.98	0.98	0.062
	Two-factor (Reactive & Proactive)	599.64	229	693.64	0.97	0.97	0.98	0.99	0.99	0.046

to 0.75 for the general study group (Figure 1). Coefficients of items related to proactive aggression factor were found to range from 0.57 to 0.93 for the junior high school, from 0.63 to 0.83 for high school, and from 0.62 to 0.82 for the general study group (Figure 1). Furthermore, correlation values between reactive and proactive subscale scores were determined as 0.79 for junior high school, as 0.72 for high school, and 0.72 for the general study group. These findings suggest that the two-factor model is consistent with the original work, and is therefore valid for the Turkish sample.

Gender and age relations

A set of regression analyses were carried out in order to determine the extent to which age and gender predicted reactive aggression, proactive aggression and total aggression. According to the results of regression analysis, both variables explain 3% of total aggression ($F_{(2,762)}$=11.25, p<0.001), 4% of proactive aggression ($F_{(2,762)}$=17.88, p<0.001), and 2% of reactive aggression ($F_{(2,762)}$)=9.71, p<0.001). Gender (ß=.13, t=3.39, p<0.001) and age (ß=0.13, t=3.09, p<0.01) are significant predictors of total aggression. However, while gender is a significant predictor of proactive aggression (ß=0.21, t=5.96, p<0.001), it is not the significant predictor of reactive aggression (ß=0.05, t=1.41, p>0.05). Age is a significant predictor of reactive aggression (ß=0.15, t=4.18, p<0.001), but it cannot predict proactive aggression (ß=0.02, t=0.46, p>0.05). In addition, t test was performed in order to examine whether there are differences in terms of gender and it was determined that proactive [$t_{(470.05)}$ =5.514; p<0.001] and total aggression [$t_{(561.63)}$ =3.41; p<0.01] scores of males are significantly higher than scores of females. No significant difference was observed between genders in terms of reactive aggression [$t_{(761)}$ =1.397; p>0.05]. These results indicate that males have higher scores of proactive and total aggression than females, and advancing age increases reactive and total aggression. However, when results are evaluated, it ought to be considered that these variables have low correlation with aggression and its forms.

Criterion-related validity

Correlations between Attitudes Toward Violence Scale (ATVS) and Deviant Peers Scale (DPS) of RPQ were investigated to examine junior high

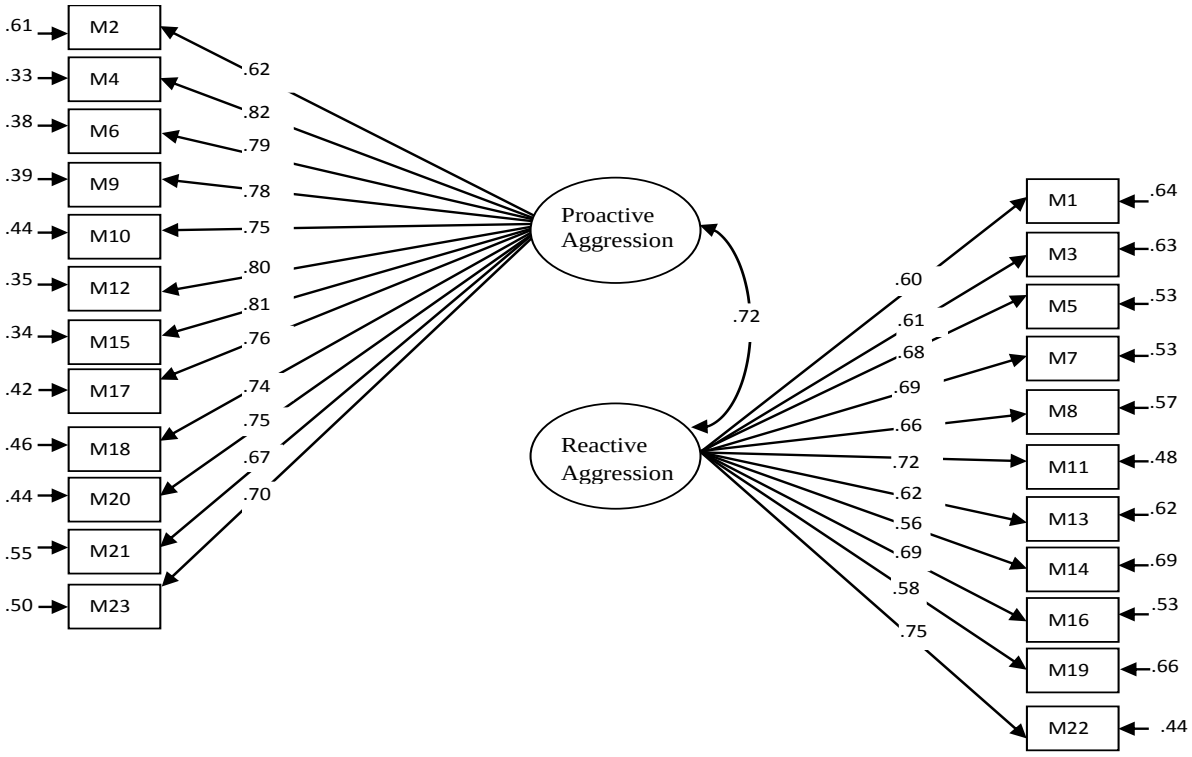

Figure 1. Reactive and Proactive Aggression Scale Standardized Path Coefficients for the General Study Group.

school study group criterion-related validity. In addition, partial correlations between variables of criteria and reactive or proactive aggression scale were examined. This examination of the relationship between criterion variables and one variable from RPQ's subscales examined by other RPQ subscale is calculated using as control variables. A positive moderate statistically significant bivariate and partial correlation, in the expected direction, was determined between reactive aggression subscale and the ATVS (r= 0.60, r= 0.41, p<0.001 respectively) and DPS (r= 0.46, r= 0.26, p<0.001, respectively). Also a positive moderate statistically significant bivariate correlation, still in the expected direction, was determined between proactive aggression and the ATVS (r=.54, p<.001) and DPS (r=.47, p<.001). Low level significant partial correlations were found between ATVS and proactive aggression (r=.28, p<.001) and DS and proactive aggression (r=.26, p<.001). In addition, a positive moderate correlation was determined between RPQ total score and the ATVS (r=0.64, p<0.001) and DPS (r=0.52, p<0.001).

Bivariate and partial correlations were investigated between RPQ and TAS, DS, Anxiety, Depression and Hostility subscales of BSI for the high school study group. A high bivariate and partial correlations in the expected direction was determined between Trait Anger subscale and reactive aggression subscale (r= 0.70, r= 0.64, p<0.001, respectively), as well as a moderate correlation between proactive aggression subscale (r= 0.35, p<0.001) but there is no significant relation in terms of partial correlation and total aggression (r= 0.65, p<0.001). A positive moderate significant correlation was found between Delinquent Behavior Scale and reactive aggression (r= 0.54, p<0.001), proactive aggression (r= 0.48, p<0.001) and total aggression (r=0.57, p<0.001). Low level significant correlation between DS and reactive aggression (r=0.27, p<0.001) and moderate significant correlation between DS and proactive aggression (r =0.39, p<0.001) was observed in terms of partial correlation. A positive moderate correlation was determined between anxiety and depression subscales, reactive aggression (r= 0.42 p<0.001, r =0.45, p<0.001 respectively) and total aggression (r= 0.41, p<0.001; r =0.40, p<0.001 respectively) and a positive low correlation was determined with proactive aggression (r=0.24, p<0.001; r=0.19, p<0.001 respectively).

A positive moderate correlation was found between hostility subscale and proactive aggression (r =0.35 p<0.001), reactive aggression (r =0.63, p<0.001) and total aggression (r =0.60, p<0.001). Besides, while there were moderate significant correlations between reactive aggression and anxiety (r =0.36 p<0.001), depression (r= 0.41 p<0.001) and hostility (r= 0.56 p<0.001), no significant correlation was determined between these

Table 2. Convergent validity of RPQ with ATVS, DPS, TAS, DS, BSI-A, BSI-D and BSI-H.

Variables	*RPQ Total*	*RPQ Reactive*	*RPQ Proactive*
ATVS	0.64***	0.60*** (0.41***)	0.54***(0.28***)
DPS	0.52***	0.48*** (0.27***)	0.47***(0.26***)
TAS	0.65***	0.70*** (0.64***)	0.35***(0.00^{ns})
DS	0.57***	0.54***(0.29***)	0.48***(0.39**)
BSI-A	0.41***	0.42***(0.36***)	0.24***(0.03^{ns})
BSI-D	0.40***	0.45***(0.41***)	0.19***(-0.04^{ns})
BSI-H	0.60***	0.63***(0.56***)	0.35***(0.06^{ns})

Partial correlations are shown in parentheses. RPQ: Reactive-Proactive Aggression Questionnaire; ATVS: Attitudes Towards Violence Scale; DPS: Deviant Peers Scale; TAS: Trait Anger Subscale; DS: Delinquency Scale; BIS-A: Brief Symptom Inventory-Anxiety Subscale; BSI-D: Brief Symptom Inventory-Depression Subscale; BSI-H: Brief Symptom Inventory-Hostility Subscale. ***p<.001; Values ≥ .05 are n.s.

Table 3. Median, standard deviation Cronbach's Alpha values and correlations for Reactive-Proactive Aggression Scale.

Variables	*Scales*	*X*	*Median*	*Sd*	*Alpha*	*Reactive*	*Proactive*	*RPQ Total*
						r	*r*	*r*
Junior High School Group (N=278)	Reactive	6.59	6	4.47	0.86	-		-
	Proactive	1.77	1	3.14	0.86	0.59***	-	-
	RPQ Total	8.36	7	6.82	0.90	0.93***	0.85***	-
High School Group (N=485)	Reactive	6.97	6	4.10	0.83	-		-
	Proactive	1.27	0	2.42	0.81	0.50***	-	-
	RPQ Total	8.23	7	5.71	0.86	0.93***	0.78***	-
General Study Group (N=763)	Reactive	6.83	6	4.24	0.84	-	-	-
	Proactive	1.45	0	2.72	0.84	0.53***	-	-
	RPQ Total	8.28	7	8.28	0.88	0.93***	0.81***	-

****p<0.001.*

variables and proactive aggression (r= 0.03 p>0.05; r=0.04 p>0.05; r=0.06 p>0.05, respectively) in terms of partial correlations. These results prove the validity of RPQ (Table 2).

Reliability and mean scores

In order to determine the reliability of RPQ, internal consistency coefficients (Cronbach's alpha) were examined. As seen in the Table 3, internal consistency coefficients were obtained as 0.86 for reactive and proactive aggression and 0.90 for RPQ total score in the junior high school student study group.

The general aggression score was 0.86, while 0.81 for proactive aggression subscale and 0.81 for reactive aggression subscale in the high school study group. When assessing the reliability coefficients for the general study group, it was determined as 0.88 for general aggression, 0.84 for reactive aggression, and 0.84 for proactive aggression. Furthermore, Spearman-Brown split-half reliability coefficients of the scale were found as 0.87 for the junior high school study group, 0.78 for the high school study group, and 0.80 for the general study group in the proactive aggression subscale. For the junior high study group 0.82 was found, 0.78 for the high school study group, and 0.83 for the general study group in reactive aggression subscale. When Pearson's product-moment correlation coefficients were examined between total score of RPQ and subscales, it was determined to range from 0.59 to 0.93 for the Junior High School Group, from 0.50 to 0.93 for the high School Group, and from 0.53 to 0.93 for the General Study Group (Table 3).

Items of RPQ to predict a total score, that is,

correlations were investigated between scores by scale items and total scores of the scale in the scope of this study. Correlation value ought to be 0.30 or higher to have adequate representation of the scale (Büyüköztürk, 2004). It was determined to range from 0.50 to 0.70 for the reactive aggression subscale, and from 0.40 to 0.74 for the proactive aggression subscale in the junior high school study group. When the high school study group was examined, it ranged from 0.48 to 0.70 for the proactive aggression scale, and from 0.47 to 0.69 for the proactive aggression scale. In the general study group, the proactive aggression scale was ranged from 0.54 to 0.68, and 0.48 to 0.67 for the reactive aggression scale. A moderate or high correlation was determined between all items and total scale score ($p<0.001$). In addition, proactive aggression scores obtained from junior high school, high school and general groups were determined to be significantly lower than reactive aggression scores [related sample respectively, $t(277) = 22.131$; $p<0.001$; $t(484) = 35.129$; $p<0.001$; $t(762)= 41.079$; $p<0.001$]. The results prove that RPQ is a reliable instrument.

DISCUSSION

The aim of this study was to examine the psychometric properties of RPQ in the sample of Turkish children and adolescents. In the study, the two-factor model was determined to produce better fit values than the one-factor model in both the junior high school and high school samples. A high correlation between two factors was observed. All factor coefficients were high. The lowest factor loading was 0.55. Other studies conducted in different cultures also support two-dimensional structure of RPQ and a high correlation between these two dimensions (Andreu et al., 2009; Baker et al., 2008; Cima et al., 2013; Pechorro et al., 2015; Raine et al., 2006).

In the study, significant correlations ranging from 0.70 to 0.78 were determined between proactive aggression and reactive aggression for junior high school, high school, and the general samples. These values are quite similar to previous studies such as Cima et al. (2013); Crick and Dodge (1996); Fung et al. (2009); Miller and Lynam (2006); Pechorro et al. (2015); Raine et al. (2006); Uz-Baş and Yurdabakan (2012). Even identified with different cognitive and emotional factors, significant positive correlations determined in many studies between these two aggressions suggest that these two forms of aggression can be seen in many children and adolescents and an individual prone to either forms of aggression cannot be excluded in terms of another aggression form.

Results of internal consistency were quite high for both reactive and proactive aggression scales in all groups. The lowest Cronbach's alpha value was 0.81. Similar results were reported in previous studies example Fung et al. (2009); Pechorro et al. (2015). When inter-item correlations were examined, item-total correlations ranged from 0.40 to 0.74 with both RPQ and reactive and proactive dimensions in all groups. The values obtained indicated the homogeneity of the items. One hypothesis of our research is that reactive aggression is positively associated with trait anger, anxiety and depression and is not associated with proactive aggression. Partial correlation results of our research confirm this hypothesis. Previous studies indicate that reactive aggression is associated with internalization symptoms such as negative emotions, anxiety, and depression (Card and Little, 2006; Fite et al., 2009; Raine et al., 2006; Marsee and Frick, 2007; Miller and Lynam 2006; Scarpa et al., 2010; Xu et al., 2009). To Raine et al. (2006), adolescents with high reactive aggression have more social anxiety. Furthermore, Card and Little (2006) reported in their meta-analytic study that while internalization problems and emotion regulation difficulties are correlated with reactive aggression, they are not correlated with proactive aggression. Results obtained in this study are quite consistent with previous studies. Stronger correlation of negative emotions such as anger, hostility and anxiety and depression with reactive aggression than proactive aggression is also consistent with the frustration-aggression model (Berkowitz and Harmon-Jones 2004).

Another hypothesis of our research is that reactive and proactive aggression and total PRQ is positively associated with delinquent behaviors, having deviant peer and attitudes towards violence. Correlation analysis results confirm this hypothesis. The results of studies indicating relationships between delinquency and reactive and proactive aggression are not consistent. Some studies determined that delinquent behaviors are particularly associated with proactive aggression (Fite et al., 2008b; Raine, et al., 2006; Vitaro et al., 2006; Scarpa et al., 2010). For instance, Vitaro et al., (1998), in the middle adolescent period, and Scarpa et al. (2010), in childhood period, determined that while delinquent behaviors predict proactive aggression, it cannot predict reactive aggression. However, some studies (Little et al., 2003; Fite et al., 2008) indicate that while there is a relation between delinquency and reactive aggression, there is no relation with proactive aggression. However, Card and Little (2006) reported that delinquency is related to both reactive and proactive aggression in their meta-analytic study. Results obtained in this study are consistent with results reported by Card and Little (2006). Impulsivity is one of the salient features of reactive aggression (Miller and Lynam, 2006). Considering that impulsivity is a risk factor for delinquency (White et al., 1994), significant correlations can be expected between reactive aggression and delinquent behaviors.

A positive moderate correlation was determined

between reactive and proactive aggression dimensions of RPQ and having deviant peers. Laird et al. (1999) determined that those who define their best friends as those with high antisocial behaviors define themselves in a similar way. Some researchers indicated that peer guilt is associated with aggression (Fite and Colder, 2007; Fite et al., 2011; Fite et al. 2010). Fite et al. (2010) reported that peer guilt is correlated with both reactive and proactive aggression, but has a stronger relationship with reactive aggression than proactive aggression. Fite et al. (2007) and Fite et al. (2011) determined that peer guilt is associated with reactive aggression. Fite and Colder (2007) reported that delinquent behavior of peer's increases reactive aggression and vice versa. In another study, moderated role of the crime of perceived best friend was determined between reactive aggressions of children and disciplinary offenses (Fite et al., 2011). Some studies indicate that peer guilt is associated with proactive aggression rather than reactive aggression (Fite et al., 2007; Fite et al., 2011), yet other studies indicate its relation with reactive aggression (Fite and Colder, 2007; Fite et al., 2010). Considering that peer with guilt and aggression behavior might be taken as a model (Warr, 1996) or that peers might reinforce their aggression behaviors either directly or indirectly, peer guilt can be expected to be associated with both reactive and proactive aggression.

Avcı and Güçray (2013) opine that there is a relationship between having a positive attitude towards violence and demonstrating aggression in adolescents. In this study, a positive relation was determined between attitudes towards violence, and reactive and proactive aggression dimensions of RPQ. Considering that having a positive attitude towards violence is one of the determinants of violence (Gellman and Waack-Delucia, 2006), it is not surprising that it is associated with both reactive and proactive aggression.

In this paper, relationships were also examined between gender, age, and aggression forms. One of our hypotheses is that males would receive higher scores than girls in both forms of aggression. In the study, males were determined to have higher proactive aggression and total aggression than females, and no correlation was determined between reactive aggression and gender. Similarly, Fung et al. (2009) suggested that as regard gender, there was no significant difference in reactive aggression scores and found males to have higher proactive and total aggression scores than females. Li and Fung (2015) opined that there is higher proactive aggression in males and no differentiation in reactive aggression in the study of Chinese adolescents as Andreu et al. (2009) found in the study of Spanish adolescents. There are studies such as Salmivalli and Nieminen (2002); Uz-Baş and Yurdabakan (2012) indicating that males have higher reactive and proactive aggression than females, yet some studies are of the opinion that there is no significant differentiation by gender in both aggression forms (Fite et al., 2008; Fite et al., 2011). These differences can be explained by cultural factors.

Culture has an important impact on perceptions and behaviors of people (Harrison and Turner, 2011). Thus, cultural factors may have different effects on aggression (Bergeron and Schneider, 2005; Forbes et al., 2009). In Turkish culture, adolescents are expected to adhere to traditional female and male gender roles. The reason of higher level of proactive aggression by male may be that male are considered more to exhibit aggressive behaviors, qualifying these behaviors as power indicators, providing prestige and strengthening males. The reason of observing no differences between females and males in terms of reactive aggressions tendencies may be that females, same as males, display impulsive and instant reactive aggressive reactions with hormonal and physical changes seen in the adolescence period in the case of frustration and provocation (Graber et al., 2006).

In this study, a positive low correlation was determined between age, reactive aggression and proactive aggression, as well as there being no correlation determined between proactive aggression and age. We hypothesized that both proactive and reactive aggression would increase when the age increased. Different results regarding the correlation between age and aggression forms can be seen in the literature. No significant correlation was determined between age and both aggression forms in many studies for instance Fite et al. (2008); Little et al. (2003); Scarpa et al. (2010). However, giving the study conducted by Fung et al. (2009), both reactive and proactive aggression correlates to age. According to this study, the increase in proactive aggression with age is higher than the increase in reactive aggression.

In addition, Uz-Baş and Yurdabakan (2012) determined that reactive aggression, proactive aggression, and total aggression increased from 4th grade to 7th grade in their study on Turkish culture. Fite et al. (2011) reached the conclusion that while reactive aggression increased with age, proactive aggression was not age-related in their study on American children. Results of previous studies are partly in line with results obtained in this study. In the literature, there are studies supporting findings of a relationship between reactive aggression and age (Fite et al., 2011; Fung et al., 2009; Uz-Baş and Yurdabakan, 2012), and no relationship between proactive aggression and age (Fite et al., 2011; Scarpa et al., 2010). Studies indicate that there is a positive relation between aggression and exhibiting risky behaviors in the adolescence period (Michael and BenZur, 2007; Silver et al., 2000). Studies related to age differences in risk-taking behaviors indicate that teenagers usually exhibit a higher proportion of risky behaviors due to increased

autonomy in later-adolescence years by mid-adolescence period (Byrnes et al., 1999). Therefore, higher aggression can be expected in the later years of adolescence by the first years of adolescence.

As a result, one-factor and two-factor models were compared in the study to determine psychometric properties of the Turkish version of RPQ and two-factor model were determine to produce better fit values for junior high school and high school study groups. Internal consistency coefficients and item-total correlations are high for both subscales. Furthermore, it was found that reactive and proactive aggressions have significant relations with the attitude towards violence, trait anger, delinquency, deviant peers, anxiety, depression, and hostility. In summary, it can be said that the Turkish version of RPQ is a reliable and valid instrument to measure two dimensions of aggression. Therefore, both researchers and practitioners working in this area can make use of this scale. The sample of the study is based on schools. Particular samples such as criminal or vulnerable children and adolescents would be required in order to ensure generalizability of these findings. Furthermore, the sample in this study is from urban areas of southern Turkey, and so, efforts to include rural areas would contribute to a better understanding of aggression behavior of Turkish adolescents and therefore develop more effective solutions or methods of prevention. In this study, the convergent validity of Turkish RPQ was examined, yet the discriminant validity was not investigated. For instance, relationships can be examined between Turkish RPQ and concepts such as self-esteem and empathy. Finally, longitudinal studies are needed in order to examine the development of aggression in the socialization process, especially for age differences in Turkish children and adolescents.

Conflict of Interests

The author has not declared any conflict of interests.

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