

# The Mediating Role of Anger in the Relationship Between Automatic Thoughts and Physical Aggression in Adolescents



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## SUMMARY

**Objective:** This study aimed to examine the mediating role of anger in the relationship between automatic thoughts and physical aggression in adolescents.

**Materials and Methods:** The study included 224 adolescents in the 9th grade of 3 different high schools in central Burdur during the 2011-2012 academic year. Participants completed the Aggression Questionnaire and Automatic Thoughts Scale in their classrooms during counseling sessions. Data were analyzed using simple and multiple linear regression analysis.

**Results:** There were positive correlations between the adolescents' automatic thoughts, and physical aggression, and anger. According to regression analysis, automatic thoughts effectively predicted the level of physical aggression ( $b = 0.233$ ,  $P < 0.001$ ) and anger ( $b = 0.325$ ,  $P < 0.001$ ). Analysis of the mediating role of anger showed that anger fully mediated the relationship between automatic thoughts and physical aggression (Sobel  $z = 5.646$ ,  $P < 0.001$ ).

**Conclusion:** Anger fully mediated the relationship between automatic thoughts and physical aggression. Providing adolescents with anger management skills training is very important for the prevention of physical aggression. Such training programs should include components related to the development of an awareness of dysfunctional and anger-triggering automatic thoughts, and how to change them. As the study group included adolescents from Burdur, the findings can only be generalized to groups with similar characteristics.

**Keywords:** Aggression, cognition, anger

## INTRODUCTION

Aggression is characterized by the intention to cause physical or emotional harm to another (Ballard et al. 2004). According to different models of aggression, the definition of aggression changes according to etiology. Based on the instinctive theories of aggression intention determines whether a behavior is aggressive or not; only behaviors performed in order to cause harm can be considered aggressive. According to behavioral theories, behavioral intention is not important; every behavior that causes physical or psychological harm to other person is an aggressive behavior (Erkuş 1994). According to Moeller (2001), physical aggression, which is among the dimensions of aggression, requires a direct act or behavior (beating, kicking, stabbing, shooting, shoving, throwing an object,

slamming at window, breaking glass, setting a fire) directed towards a person, animal or object. Buss and Perry (1992) reported that physical, verbal, and indirect aggression represent the behavioral component of aggression. They concluded that anger includes physical arousal and preparation to act aggressively, that anger constitutes the emotional component of aggression, and that hostile aggression includes cruelty and feeling like a victim, which constitutes the cognitive component of aggression.

Similarly, the cognitive model of aggression emphasizes that the factor that influences a person's emotions and related behavior is not the situation itself, but a person's interpretation of a particular situation, which is influenced by past interpretations of similar situations (Beck 2001). Automatic thoughts are defined as repeated negative or positive automatic self

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statements that an individual repeats to him/herself in certain situations. People generally accept these thoughts as correct without thinking about them critically (Beck 2001). Automatic thoughts are generally negative (Franklin 2005) and contain 1 prejudice or logical errors, such as selective abstraction, overgeneralization, and arbitrary inference (Davison and Neale 1998). Beck (1976) suggested that many illnesses are caused by negative thoughts about self, the environment, and the future.

The cognitive structure in Beck's model is used to understand such disorders as depression and anxiety; however, few studies have investigated the relationship between this structure and externalizing disorders. Nonetheless, it was reported that automatic thoughts related to hostility and revenge are the most powerful predictors of aggression (Kurtoğlu 2009; Calvete and Connor-Smith 2005; Calvete et al. 2005; Schniering and Rapee 2004), and that passive-aggressive individuals have automatic thoughts that are primarily related to cruelty and revenge (Beck et al. 2008). Other studies observed that there was a strong relationships between adolescents' anger and such psychological symptoms as depression and anxiety (Bozkurt and Çam 2010), and between aggression and irrational beliefs (Fives et al. 2011).

It was reported that anger, which forms the emotional components of aggression, doesn't emerge out of a planned activity, but primarily occurs in situations in which an individual experiences frustration, injustice, criticism, or contempt (Lohr et al. 2007; Balkaya and Şahin 2003). The cognitive-behavioral model focuses on the interactions between thoughts and emotions, and behavior. Among its basic assumptions is that cognition affects emotion and behavior (Reinecke et al. 2003; White and Freeman 2000); therefore, in the emergence of anger an individual's perception of an event and interpretations of the situation might be influential. Özer (1994) reported that there are 2 basic thought structures that people have as the level of anger increases: (1.) Sensitivity and intolerance to making errors; (2.) Effort to protect the ego. Deffenbacher (1999) also reported that the cognitive structure that causes anger includes thoughts and attributions, including exaggerated thoughts related to being treated unfairly thinking that others deserve revenge, punishment, or to be attacked, blaming others, and externalization. Novaco (2000) also suggested that anger is caused by an individual's interpretations of particular situations; the most significant characteristic of such interpretations is perceived malign intent. Perceived malign intent together with justification for defense/revenge can result in anger (Novaco, 2000). Boman (2003) reported that anger is related to an individual's negative attributions about the world; therefore, the cognitive dimension of anger is indicative of negative beliefs or hostility. The behavioral dimension of anger, also known as anger expression, is 1 type of

response characteristically exhibited in anger provoking situations (Smith and Furlong 1998).

The expression of anger can be positive or destructive (Balkaya and Şahin 2003; Boman 2003; Soykan 2003). Anger as all emotions, is natural and universal, and when expressed in a healthy manner can improve interpersonal communication; however, it can become uncontrollable and destructive. Averill (1983) observed that 83% of people reported using verbal aggression and 40% reported using physical aggression when they were angry. Many studies report that anger is an important variable associated with whether or not people exhibit aggressive behaviors (Gündoğdu 2010; Karataş 2008; Larson 2008; Kesen et al. 2007; Campano and Munakata 2004; Brezina et al. 2001; Dwyer 1998; Furlong and Smith 1994).

As understood based on the above-mentioned research, automatic thoughts are related to both anger and aggression. In addition, in consideration of the relationship between anger and aggression, it might be considered that anger mediates the relationship between automatic thoughts and physical aggression. As such, the present study aimed to examine the mediating role of anger in the relationship between automatic thoughts and physical aggression in adolescents.

## MATERIALS and METHODS

### Study sample

The study included 224 randomly selected adolescents (126 females [56.3%] and 98 males [43.7%] in the 9th grade of 3 different high schools in centrel Burdur, Turkey, during the 2011-2012 academic year. Mean age of the students was  $14.991 \pm 0.401$  years (range: 14-16 years).

### Data collection instruments

#### Aggression Questionnaire (AQ)

Buss and Perry (1992) developed, and Buss and Warren (2000) updated the AQ, which was adapted for use in Turkey by Can (2002). The 5-point Likert-type scale includes 34 items. The maximum score is 170 and the minimum score is 34. Scores  $\leq 58$  indicate a low level of aggression, scores of 59-110 indicate a normal level of aggression, and scores  $\geq 110$  indicate a high level of aggression (Can 2002; Buss and Warren 2000). The AQ includes 5 subscales: physical, verbal, indirect aggression, anger and hostility. In the present study only the physical aggression (PA) and anger (A) subscales were used. The scale was reported to be valid and reliable for use with adolescents (Gündoğdu 2010; Yavuzer and Üre 2010; Karataş and Gökçakan 2009). In the present study its construct validity was assessed using confirmatory factor analysis. The fit indexes were  $X^2/SAD = 1.392$ , CFI. = 0.897, GFI. = 0.856,

AGFI. = 0.859, RMR. = 0.051, and RMSEA. = 0.042. In consideration of the goodness-of-fit values, we considered that all indexes were within acceptable limits and that the scale's 5-factor structure was confirmed. Moreover, internal consistency values were 0.86 for the PA and 0.59 for A subscales.

### Automatic Thoughts Scale (ATS)

The 30-item 5-point Likert-type ATS was scale developed by Hollan and Kendall (1980) and adapted for use in Turkey by Şahin and Şahin (1992). The minimum score is 30 and the maximum score is 150. Higher scores indicate a higher frequency of automatic thoughts. Research on the reliability of the Turkish version calculated its Cronbach's alpha internal consistency coefficient as 0.93. The item total correlations between item scores and total score were calculated as 0.30-0.69 (Savaşır and Şahin 1997). In the present study the internal reliability was calculated as 0.94. The ATS was developed to identify automatic thoughts associated with depression. It was also used in studies that investigated the relationship between automatic thoughts and externalizing disorders (Kurtoğlu 2009; Calvete and Connor-Smith 2005, Calvete et al. 2005).

### Procedure

The study protocol was approved by the local office of the Turkish Ministry of Education. The students were verbally informed about the study and its procedures, and all provided verbal consent to participate. Then, the scales were administered to the students in their classrooms during counseling sessions. Additional volunteers from the same school were re-selected to take place of those that did not agree to participate in the study (n = 20). The scales were completed in approximately 20-25 min.

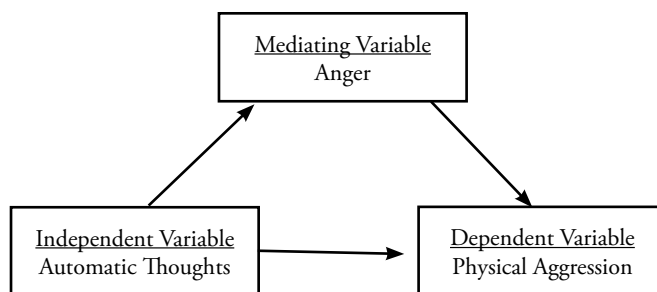
### Data analysis

Data were analyzed using SPSS v.13.0 for Windows. Simple and multiple linear regression analyses were used to analyze the data. Before conducting the analyses, assumptions of the multiple linear regressions were tested. It was determined that normality and linearity assumptions of the multiple linear regression were satisfied.

Data were assessed in terms of outliers; 12 outliers with Mahalanobis distance values were removed from the data set, and the data were analyzed with 224 data points. When testing autocorrelation, the Durbin-Watson coefficient was used. Durbin-Watson values varied between 1.753 and 1.924. Tolerance and VIF values were also within acceptable limits. Previous research reported differences between females and males, in terms of aggression (De Wied et al. 2007; Campano and Munakata 2004; Orpinas et al. 1999; Miller et al. 1986); therefore, preliminary analysis was conducted for gender on the AQ PA and A subscale scores, and ATS scores. Moreover,

as the AQ PA and A subscale scores differed between genders, gender was entered as a control variable in the first block in regression analysis. For the gender variable, female was coded as 0, re-identified as the dummy variable, and included in the regression analysis.

In the present study the mediating effect of anger in the relationship between automatic thoughts and physical aggression was investigated within the context of Baron and Kenny (1986). First, 2 variables (ATS and the AQ PA subscale) should be strongly correlated. Second, the suggested mediator variable measured via the AQ A subscale should be associated with both of 2 previous variables. Third, when controlling for the mediator variable, the relationship between the 2 variables (ATS and the AQ PA subscale) should weaken. A reduction in the strength of the correlation between the 2 variables (ATS and the AQ PA subscale) indicates partial mediation; a weak correlation between the 2 variables (ATS and the AQ PA subscale) indicates full mediation. In each regression analysis the significance of the difference between the beta (b) values of the predictor variable and the strength of the relationship between the mediator variable, and the predictor and predicted variables were investigated. The significance of the difference between the b values was assessed using the Sobel test. To test the mediator variable 3 different regression equations were used as shown in the Figure.



**Figure.** Relationships according to the predicted mediating model.

## RESULTS

Preliminary analysis of the effect of gender on AQ PA and, A subscale scores, and ATS scores

The findings showed that there were significant gender-based differences in AQ PA ( $t = 4.265$ ,  $P < 0.001$ ) and A ( $t = 3.407$ ,  $P < 0.001$ ) subscale scores, but not in the ATS scores ( $t = 0.452$ ,  $P > 0.05$ ); the male adolescents had higher AQ PA and A subscale scores than did the females.

Mean AQ PA and, A subscale, and ATS scores, standard deviations, and correlation coefficients

Based on the preliminary analysis of gender differences in AQ PA and A subscale scores, correlation analysis was conducted

**Table 1.** The relationships between the study variables and their mean  $\pm$  SDs.

	Variables	Mean	SD	PA	A	ATS
Female	1. PA	16.777	6.506	1.00		
	2. A	19.023	5.222	0.514**	1.00	
	3. ATS	52.079	18.992	0.219*	0.374**	1.00
Male	1. PA	20.642	7.004	1.00		
	2. A	21.346	4.848	0.561**	1.00	
	3. ATS	50.979	16.791	0.277*	0.271	1.00

\* $P < 0.05$ , \*\* $P < 0.01$ ,  $n_{\text{female}} = 126$ ,  $n_{\text{male}} = 98$

PA: AQ physical aggression subscale; A: AQ anger subscale; ATS: Automatic Thoughts Scale.

separately for females and males. The findings showed that there was moderately positive correlations between the males' AQ PA subscale and ATS scores ( $r = 0.277$ ,  $P < 0.01$ ), between AQ PA and A subscale scores ( $r = 0.561$ ,  $P < 0.01$ ), and between AQ A subscale and ATS scores ( $r = 0.271$ ,  $P < 0.01$ ). There was also a moderately positive correlation between the females' AQ PA subscale and ATS scores ( $r = 0.219$ ,  $P < 0.05$ ), as well as between AQ PA and A subscale scores ( $r = 0.514$ ,  $P < 0.01$ ), and between the AQ A subscale and ATS scores ( $r = 0.374$ ,  $P < 0.01$ ). The relationships between the study variables, mean values, and SDs of the variables are shown in Table 1.

### Mediating test results

Regression analysis of the mediating role of anger in the relationship between automatic thoughts and physical aggression was conducted in 3 steps, according to Baron and Kenny (1986), and the findings are shown in Table 2. As preliminary analyses showed that there was a gender-based difference in AQ PA and A subscale scores, for each step of the analysis gender was entered as a control variable in the first block. In the first step automatic thoughts positively and significantly predicted physical aggression ( $b = 0.233$ ,  $P < 0.001$ ), and explained 13% of the variation. In the second step automatic

**Table 2.** Regression analysis of the mediating role of anger in the relationship between automatic thoughts and physical aggression.

	Variables	B	Std. Error	b	t	P
Step 1 PA (dependent variable)	Gender	3.964	0.882	0.282	4.497	0.000
	ATS	0.090	0.024	0.233	3.717	0.000
	$R=0.361$ , $R^2=0.130$ , $F=16.530$					
Step 2 A (dependent variable)	Gender	2.426	0.645	0.233	3.764	0.000
	ATS	0.094	0.018	0.325	5.262	0.000
	$R=0.394$ , $R^2=0.155$ , $F=20.345$					
Step 3 PA (dependent variable) ATS (independent variable) A (mediating variable)	Gender	2.324	0.792	0.165	2.933	0.004
	A	0.676	0.080	0.502	8.439	0.000
	ATS	0.027	0.022	0.070	1.207	0.229
	$R=0.586$ , $R^2=0.343$ , $F=38.260$					

PA: AQ physical aggression subscale; A: AQ anger subscale; ATS: Automatic Thoughts Scale.

thoughts positively and significantly predicted anger ( $b = 0.325$ ,  $P < 0.001$ ), and explained 15.5% of the variance. In the third step, anger was identified as a mediating variable that positively and significantly predicted physical aggression ( $b = 0.502$ ,  $P < 0.001$ ). Anger and automatic thoughts together explained 34.3% of the variance. Furthermore, automatic thoughts together with the mediating variable (anger) did not significantly predict physical aggression ( $b = 0.070$ ,  $P = 0.382$ ; Table 2). These findings indicate that anger fully mediated the relationship between automatic thoughts and physical aggression (Sobel  $z = 5.646$ ,  $P < 0.001$ ) in the study group.

## DISCUSSION

The present study investigated the relationships between automatic thoughts, and physical aggression and anger in an adolescent population. The first step of the analysis showed that automatic thoughts positively and significantly predicted physical aggression, which is consistent with earlier research on the relationship between automatic thoughts associated with hostility, and revenge and aggression (Fives et al. 2011; Bozkurt and Çam 2010; Kurtoglu 2009; Calvete and Connor-Smith 2005; Calvete et al. 2005; Schniering and Rapee 2004; Beck and Freeman 1990). Berkowitz (1990) reported that negative evaluations or interpretations of a given situation might provoke aggressive behaviors. Furthermore, if an individual perceives others as aggressive she/he may behave defensively or aggressively (Safran and Segal 1990), and consider his/her aggressive behaviors as acceptable and logical (Nasir et al. 2011). This finding indicates that the role of cognition (automatic thoughts) plays an important role in the conceptualization of aggression.

In the second step of the analysis, the relationship between automatic thoughts and anger was investigated. The findings show that the adolescents' automatic thoughts significantly predicted their level of anger. Similar research showed that anger is associated with negative life experiences and depression (Puskar et al. 2008), irrational beliefs and cognitive distortions (Fives et al. 2011). Automatic thoughts have also been identified as predictors of negative mood states (McHugh and Wierzbicki 1998) and negative emotions (Schniering and Rapee 2004). It was reported that feelings and behaviors associated with anger are created primarily by beliefs (such as, people shouldn't make mistakes, I should be making more money) (Boman 2003, Deffenbacher 1999; Murphy 1980). According to cognitive theory, in order to understand the cause of an emotional event or an emotional disorder, the cognitive content of an individual's reaction to an event or their automatic thoughts should be understood (Corey 2005). As such, the anger an individual experiences is not caused by events or situations that she/he has experienced, but the meanings given to those events or situations (Beck

2001; Novaco 2000; Deffenbacher 1999), which is why cognitive processes are the best target for controlling reactions to anger and anger-provoking situations.

In the third step of the analysis the mediating role of anger in the relationship between automatic thoughts and aggression was examined, and it was determined that anger significantly predicted physical aggression. It was reported that 40% of behavioral responses to anger were aggressive (Averill 1983). Studies on the relationship between aggression and anger (Gündoğdu 2010; Karataş 2008; Larson 2008; Kesen et al. 2007; Campano and Munakata 2004; Brezina et al. 2001; Dwyer 1998; Furlong and Smith 1994) reported that anger is an important variable affecting whether or not an individual behaves aggressively; however, it is possible that anger is not associated with every aggressive behavior and that anger might not always be expressed via aggression (Balkaya and Şahin 2003; Averill 1983). Typical reactions to anger are suppression, appropriate expression of anger, and aggression. When anger is expressed in an appropriate way it is a healthy and natural emotion; however, when it is expressed in an aggressive and destructive manner it can negatively affect social relationships.

Another finding related to the third step of the present study's analysis is that anger fully mediated the relationship between automatic thoughts and physical aggression. This result shows that automatic thoughts result in anger and that anger leads to physical aggression. In terms of theory, childhood experiences lead to some basic thought and belief systems via learning, and these structural systems are known as schema. Life experiences activate schemata and lead to the emergence of negative automatic thoughts, followed by the development of unpleasant emotions, such as anger, anxiety, guilt, and sadness (Demiralp and Oflaz 2007). Automatic thoughts are an individual's interpretations of particular situations (Beck 2001), and inner conversations related to self, the world, and the future. In general, they are spontaneous, latent and have cycles, and emerge suddenly. They are combined with other emotions, depending on their content and meanings. In general, individuals are aware of the emotions associated with automatic thoughts, but not the thoughts themselves; however, individuals might be trained to be aware of such thoughts (Türkçapar 2007). Anger is also a structure composed of physiological (increased heart rate, and blood pressure), cognitive (irrational beliefs and automatic thoughts), perceptual (recognizing anger subjectively and labeling anger feelings), and behavioral (suppression, directing towards inside, and verbal and physical aggression) dimensions (Yılmaz 2004). Whereas the cognitive dimension of anger is related to an individual's negative attributions of the world (Boman 2003), its behavioral dimension is related to the reaction style used in response to situations that provoke anger (Smith and Furlong 1998).

In summary, when an individual experiences frustration, contempt, injustice and aggression they may feel angry, which leads to such reactions as suppression of anger, and verbal and physical aggression. According to the results of the present study, automatic thoughts, anger, and physical aggression were all inter-related in the adolescent study group. That automatic thoughts create anger and anger creates physical aggression is theoretically the anticipated result.

## CONCLUSION

The present findings show that anger fully mediated the relationship between automatic thoughts and physical aggression. Providing adolescents with anger management skills training is very important for the prevention of physical aggression. Such training programs should include components related to the development of an awareness of dysfunctional and anger-triggering automatic thoughts, and how to change them.

The study sample consisted of adolescent students from 3 different high schools in central Burdur. The fact that the study was conducted with a student sample from just 1 city is a limitation. Another limitation of the study is that the sample consisted of 9th grade students aged between 14 and 16 years. We think that additional research is warranted and should include adolescents of a wider age range, non-students, and those from different regions of Turkey to better delineate the mediating role of anger in aggression.

Data in the present study were collected based on self-assessment, and only physical aggression was examined other types of aggression were not taken into consideration. It has been reported that verbal aggression might also be related to anger (Averill 1983). For future studie, a model that also includes verbal aggression might be more explanatory. Another limitation of the present study is that anger and physical aggression were assessed via subscales of the same questionnaire; more detailed investigations are required and can be accomplished via use of anger scales with multiple dimensions.

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