

# The mediating role of emotional eating in the relationship between aggression and eating attitudes

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## ABSTRACT

**Aims:** Negative emotions and thoughts are known to be associated with eating problems. In recent years, strong relationships have been established between disordered eating attitudes and aggression, which are important in the growth of increasing eating disorders. This article examines the mediatory role of emotional eating in the relationship between aggression and disordered eating attitudes in adult individuals.

**Methods:** The study included 293 participants, including 70 males and 223 females, accessed through a convenience sampling method. In the study, participants completed the Demographic Information Form, the Eating Attitude Test, the Buss-Perry Aggression Scale, and the Turkish Emotional Eating Scale.

**Results:** Participants with disordered eating attitudes and emotional eating were found to have significantly higher average aggression scores than participants with healthy eating attitudes and without emotional eating. There has been a positive significant relationship between hostility and emotional eating and between hostility and disordered eating attitudes. The results of the structural equation model showed that among the types of aggression, only hostility and all disordered eating attitudes (preoccupation with eating, restriction, social pressure) played an instrumental role in the relationship.

**Conclusion:** Hostility and emotional eating behavior should be addressed in different preventive studies and intervention programs in which disordered eating attitudes seem in the fields of both mental health and health sciences.

**Keywords:** Aggression, emotional eating, eating attitudes

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## INTRODUCTION

Character traits such as anger, hostility, and aggression are known to be related to impulsivity and cause eating problems. Aggression can be thought of as a character trait with emotional, cognitive, and behavioral components.<sup>1</sup> Emotional component consists of anger (that includes physiological arousal), the cognitive component consists of thoughts including hostility (negative beliefs about others' intentions), the behavioral component consists of physical aggression (physically harming others) and verbal aggression (verbally harming others) and is considered in four dimensions in total.<sup>2</sup> Anger acts as a bridge between hostile thoughts and physical/verbal aggression, i.e. behaviors.<sup>1</sup> In this context, it can be thought that hostile thoughts bring along emotions that indicate physiological arousal, such as anger, and then reveal behavior.

Although eating behavior is important for survival, it is not motivated solely by hunger and appetite. Psychological factors such as an individual's health status and body perception also affect eating attitudes.<sup>3</sup> It is known that disordered eating attitudes play an important role in developing eating disorders.<sup>4</sup> In Turkey, a study conducted with the emerging adulthood sample showed that the point prevalence of eating disorders was 1.55 % (n=27 females, 2 males).<sup>5</sup> Disordered eating attitudes are addressed through preoccupation with eating (bulimia/preoccupation with eating), dieting (restriction), and oral control (social pressure). In people with high preoccupation with eating, the person's mind is preoccupied with feelings and thoughts about their body and the act of eating. People with a high preoccupation with eating desire to lose weight, fear gaining weight, and think that the act of eating is a very important part of

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their lives. They also desire to have control over the act of eating. Thoughts about their bodies and exercising present themselves. Dieting is the attitude of individuals to limit their food intake, go on a diet, and avoid certain types of food intake. Oral control includes attitudes towards maintaining control over eating and the perceived pressure of others' approaches to avoid gaining weight and caring about their bodies and other people's opinions regarding eating.<sup>6</sup>

Macht<sup>7</sup> suggested that negative emotions can both increase and decrease food intake depending on their intensity: negative emotions with high arousal, such as fear or anger, can reduce food intake due to the physiological effect on metabolism, while moderate negative emotions increase food intake. Other studies in the literature have also shown that anger, hostility, and aggression are at high levels in people diagnosed with eating disorders<sup>8-9</sup> and that these emotions are psychopathological factors that attract attention to eating disorders.<sup>10-16</sup> Carmody et al.<sup>16</sup> found that research participants with high levels of food restriction, hunger, and diet helplessness also had higher hostility scores. Stating that hostility is the antecedent of Bulimia Nervosa<sup>17</sup> makes it important to understand the relationship between bulimia, which is among the negative eating attitudes, and eating preoccupation with hostility.

Evidence showed that people diagnosed with eating disorders were five times more likely to accept violent acts than the healthy group.<sup>18</sup> Both in a study conducted with adolescent participants in a healthy population<sup>14</sup> and in a study conducted with participants with anorexia nervosa and bulimia nervosa, who were at the borderline of health in terms of eating disorders,<sup>1</sup> a positive correlation was found between the tendency towards aggression and the risk of eating disorders.

Studies conducted with ecological momentary assessment in patients with eating disorders have also shown a positive relationship between binge eating episodes and negative emotions.<sup>19-22</sup> It has been shown that the emotions that initiate a binge eating episode are emotions that have a negative value, cause high arousal, and lead to higher avoidance behavior.<sup>23</sup> Berg, Crosby, Cao<sup>24-25</sup> revealed the role of emotions such as fear, hostility, sadness, and guilt as the precursors of the binge eating episode.

Emotional eating is defined as overeating in response to negative emotions. This type of overeating behavior can lead to excessive energy intake, affecting overall health and mental health. Although emotional eating is considered a condition seen primarily in bulimic individuals, it is also seen in individuals diagnosed with binge eating disorder, individuals who diet to lose weight

or normal weight, and some obese individuals.<sup>26</sup> It is also known to cause consequences such as excessive food consumption, difficulty in weight control, and bulimic eating attitudes.<sup>27</sup>

Many studies in the literature point out the strong relationship between aggression and disordered eating attitudes.<sup>14,18</sup> In addition, when trying to make disordered eating attitudes healthy, it has become increasingly important to consider emotional eating as well as the effects of character traits that include negative emotions such as aggression.<sup>26</sup> In order to develop a specific intervention method for aggression in the treatment of eating disorders that develop with disordered eating attitudes.<sup>14,28-30</sup> The mechanisms between these variables should be figured out. Based on this aim, this study will examine the mediating role of emotional eating in the relationship between different types of aggression and eating attitudes.

## METHODS

The study was carried out with the permission of İstanbul Arel University Ethics Committee (Date: 26.02.2020, Decision No: 2020-15). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The informed consent form and scales used in the research were delivered to the participants via Google Forms. It took 3 months to collect data. There is no missing or lost data.

This research consists of 293 participants between the ages of 18-55, obtained through convenience sampling. Among the participants, 223 people (76.1%) were women and 70 people (23.9%) were men.

### Data Collection Tools

**Buss Perry aggression scale:** The scale developed by Buss and Perry consists of 29 items and 4 sub-dimensions. 2 Scale sub-dimensions are physical aggression, verbal aggression, hostility, and anger.<sup>2</sup> The scale was adapted to Turkish and the internal consistency coefficient of the Buss Perry Aggression Scale is 0.85. From the subscales the internal consistency coefficient of physical aggression was stated as 0.78; the internal consistency coefficient of verbal aggression was stated as 0.48; the internal consistency coefficient of hostility was stated as 0.71; the internal consistency coefficient of anger was stated as 0.71.<sup>31</sup> The scale is a 5-point Likert type (1=does not describe me at all, 5=describes me completely). Items 9 and 16 of the scale were reverse-scored.<sup>31</sup> In the reliability analysis conducted within the scope of the research, the Cronbach Alpha coefficient of the scale was found to be 0.90 (sub-dimensions: physical aggression: 0.81, hostility: 0.79, anger: 0.80, verbal aggression: 0.63).

**Turkish emotional eating scale:** Turkish Emotional Eating Scale consists of 30 items. The scale is 5-point Likert (1=never, 5=almost always). Scoring 75 points or above on the scale indicates that the participants have a tendency to emotional eating. The scale consists of four sub-factors. The internal consistency coefficient of the scale is 0.95. Cronbach Alpha values for the sub-factors of the scale are 0.94 for eating under tension, 0.80 for self-control, 0.93 for eating to cope with negative emotions, and 0.64 for control in the face of stimuli.<sup>32</sup> In the reliability analysis conducted within the scope of the research, the Cronbach Alpha value of the scale was found to be 0.95 (sub-dimensions: eating under tension: 0.94, eating to cope with negative emotions: 0.94, eating for self control: 0.65, and self-control in the face of stimuli: 0.68).

**EAT 26 eating attitude scale:** EAT 26 Eating Attitude Scale examining risky eating attitudes is the short form of 40 items Eating Attitude Scale developed by Garner, Olmstad, Bohr and Garfinkel.<sup>7</sup> The 26-item Turkish short form of the Eating Attitude Scale was used in the study.<sup>33</sup> Within the scope of the reliability analysis of the original form of the scale, the internal consistency coefficient was found to be 0.84 (for sub-dimensions: dieting: 0.62, bulimia / preoccupation with eating: 0.85 and oral control: 0.76). The scale consists of A-B-C parts. Section A includes demographic information such as weight, height, lowest and highest weight. In section B, there are scale items with 26 questions, 4-point Likert type (Always=3, Very often=2, Often=1, other answers: Sometimes / Rarely / Never=0). In section C of the scale, it is checked whether there has been any deterioration in eating behavior in the last six months.<sup>33</sup> In this study, the reliability of the scale was found to be 0.77 (sub-dimensions of dieting: 0.76, bulimia and preoccupation with eating: 0.58 and oral control: 0.57).

### Statistical Analysis

The data obtained from the research were analyzed with SPSS 22.0 and LISREL program. It was seen that the data set met normality assumptions (skewness and kurtosis values changed between -.42 and 1.16). The skewness and kurtosis values are assumed to be normal variance when they are between +1.5 and -1.5.<sup>34</sup> Therefore parametric tests were used in the research. In the study, the relationship between the scores obtained from all subscales was examined by correlation analysis. Then, the subscales related to aggression, which is the independent variable, and the eating attitude subscales, which are the dependent variable, were added to the model separately as latent variables to see which subscales were significant. A structural equation model was created by adding the mediator variable, emotional eating, as a single latent variable. Although it is a traditional method, structural

equation modeling is considered superior to other mediation analyzes as it allows measurement errors to be taken into account at once.

To test the goodness of fit indices of the structural model, the ratio of chi square to degrees of freedom ( $\chi^2 / df$ ), root mean square error of approximation (S-RMR), goodness of fit index (GFI), incremental fit index (IFI), root mean square error of approximation (RMSEA) and confirmatory fit index (CFI) were used. A chi-square / degree of freedom ( $\chi^2 / df$ ) value of less than 2 is an indicator of good fit, and a value of less than 5 is acceptable. CFI, GFI, IFI values above .90 indicate a good fit. S-RMR and RMSEA values being less than .05 are indicative of good fit, while values being less than .08 are acceptable.<sup>35,36</sup>

### RESULTS

Of the total 293 participants in the sample, 223 people (76.1%) were women and 70 people (23.9%) were men. The survey included 53 people (18.1%) in the 18-24 age range, 111 people (37.9%) in the 25-30 age range, 43 people (14.7%) in the 31-35 age range, 32 people (10.9%) in the 36-40 age range and 54 people (18.4%) over the age 40. In terms of education level, 9 (3.1%) of the participants were primary school graduates, 27 (9.2%) were high school graduates, 187 (63.8%) were university graduates, 59 (20.1%) were masters graduates and 11 (3.8%) were doctoral graduates. In terms of marital status 127 (43.3%) of the participants are married, 159 (54.3%) are single and 7 (2.4%) are living together. 34 (11.6%) of the participants stated that they had low financial status, 144 (49.1%) had medium financial status, 94 (32.1%) had upper middle status, 20 (6.8%) had high financial status and 1 had very high financial status. (0.3%).

There is a significant difference between gender according to aggression [ $t(291)=-3.315$ ;  $p<0.01$ ], emotional eating [ $t(145.33)=3.365$ ;  $p<0.01$ ], and eating attitude [ $t(291)=2.613$ ;  $p<0.01$ ]. Accordingly, men's aggression ( $\bar{x}=2.74$ ) average score was found to be significantly higher than women's aggression ( $\bar{x}=2.46$ ) average score. Women's eating attitude ( $\bar{x}=5.9$ ) and women's emotional eating ( $\bar{x}=2.49$ ) mean scores were found to be significantly higher than men's eating attitude ( $\bar{x}=4.6$ ) and men's emotional eating ( $\bar{x}=2.15$ ) mean scores.

According to the Turkish emotional eating scale, a test score of 75 or above indicates emotional eating. In the study, 174 (59.4%) of the participants had emotional eating behavior. According to the EAT-26 Eating Attitudes Test, a test score of 20 points or above indicates that people may have unhealthy eating attitudes. In the study, it was found that 88 (30%) of the participants may have had unhealthy eating attitudes.

Pearson product moment correlation analysis results for the variables are shown in Table. When the goodness of fit values of the structural model used to test the mediation hypothesis of the research was examined, it was seen that the model provided the necessary values for the goodness of fit indices ( $\chi^2=39.18$ ,  $df= 12$ ,  $\chi^2/ df= 3.2$ ,  $RMSEA= .08$ ,  $NFI= .93$ ,  $CFI= .95$ ,  $GFI= .97$ ).

When the model is examined, it is seen that all factor loadings are between -0.04 and 0.44 as shown in Figure. Indirect effect values were calculated via LISREL. According to the tested structural equation model, the indirect effect of hostility on emotional eating, bulimia/eating preoccupation variable ( $\beta =.19$ ,  $t=9.41$ ,  $p<.05$ ), dieting variable ( $\beta =.4$ ,  $t=3.51$ ,  $p<.05$ ), and oral control variable ( $\beta =.4$ ,  $t=2.63$ ,  $p<.05$ ) was found to be statistically significant. Accordingly, emotional eating mediates the relationship between hostility and all eating attitudes. Emotional eating explains 19% of the variance in the relationship between hostility and bulimia/preoccupation with eating, emotional eating explains 4% of the variance in the relationship between hostility and dieting, and emotional eating explains 4% of the variance in the relationship between hostility and oral control.

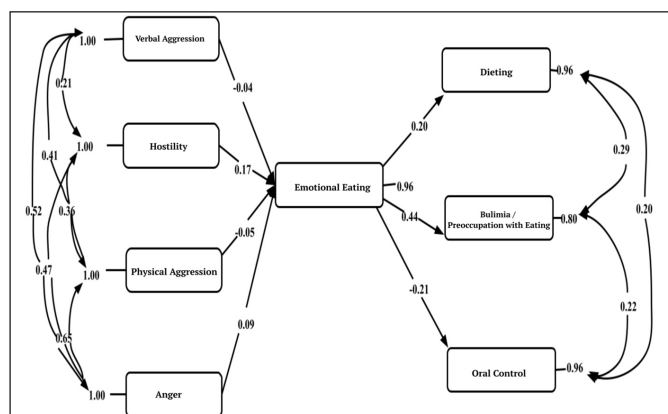


Figure. Standardized solution of structural equation model.

## DISCUSSION

In this study, the mediational effect of emotional eating on the relationship between different types of aggression and eating attitudes was examined. According to the research findings, it was found that emotional eating mediated the relationship between the hostility sub-dimension of aggression, which includes the belief that other individuals' intentions are negative and they are likely to cause harm, and all eating attitudes such as bulimia/ preoccupation with eating, dieting, and oral control. According to personality profiles of patients with bulimia and obesity, they are described as hostile and angry but unable to express these feelings directly.<sup>37</sup> It is suggested that hostile cognitions trigger anger, and thereby physical and verbal aggression may occur.<sup>2</sup> So, hostility may be the core structure within different types of aggression, and predict all distorted eating attitudes via emotional eating.

Since emotional eating inherently involves preoccupation with eating, in our study, preoccupation with eating/ bulimia has been shown to explain approximately five times more variance in disordered eating attitudes than dieting and oral control. In addition, emotional eating has been found to be important on the path to eating attitudes that include hostility and restrictive behaviors such as dieting and oral control. Carmody et al.<sup>17</sup> found that research participants with high levels of food restriction, hunger, and diet helplessness also had higher hostility scores and weight fluctuation. This research reveals that people turn to emotional eating in order to cope with thoughts of hostility, and this may cause distortions in their eating attitudes. However, dieting was found to be weakly associated with hostility; even general distress levels were controlled. One explanation for this weak association may be based on restricted eating after emotional eating occurs.<sup>17</sup> On the other hand, diet may also play an important role in the control of aggression.

**Table.** Correlation table presenting the mean, standard deviation of observed variables, and the relationships between variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. AGG	2.5	.64	1													
2. EA	0.5	.35	.12*	1												
3. EE	2.8	.83	.14*	.18**	1											
4. PA	2.0	.78	.82**	.01	.05	1										
5. VA	2.8	.76	.64**	.07	.04	.41**	1									
6. ANG	2.5	.90	.86**	.10	.11*	.65**	.51**	1								
7. HOS	2.2	.67	.69**	.32**	.18**	.35**	.31**	.47**	1							
8. BUL	0.2	.39	.17**	.57**	.43**	.08	.04	.16**	.22**	1						
9. DIE	2.4	.51	.11	.89**	.20**	.02	.08	.01	.27**	.36**	1					
10. OCO	0.5	.46	.02	.55**	-.20**	-.06	.08	-.03	.17**	.14*	.21**	1				
11. ET	2.3	1.00	.14*	.20**	.96**	.05	.04	.12*	.17**	.41**	.21**	-.17**	1			
12. ENE	2.2	1.05	.12*	.21**	.95**	.03	.06	.08	.17**	.37**	.24**	-.16**	.91**	1		
13. ESC	2.5	.70	.08	-.06	.59**	.06	-.02	.09	.05	.32**	-.03	-.33**	.45**	.43**	1	
14. EFS	2.9	.93	.11*	.12*	.65**	.03	.00	.10	.16**	.33**	-.09	-.07	.59**	.52**	.33**	1

Notes: N=293 \*\*p< 0.01, \*p< 0.05; AGG: Aggressiveness; EA: Eating Attitudes; EE: Emotional Eating; PA: Physical Aggression; VA: Verbal Aggression; ANG: Anger; HOS: Hostility; BUL: Bulimia / Preoccupation with Eating; DIE: Dieting; OCO: Oral Control; ET: Eating under Tension; ENE: Eating to Cope with Negative Emotions; ESC: Eating for Self Control; EFS: Eating in the face of stimuli



Therefore, our study model seems to capture the path in which emotional eating behavior reveal.

Research on the treatment of eating disorders has revealed that anger and hostility can hinder the psychologist or psychiatrist's guidance during the treatment process, and especially hostility can be a reason for discontinuing treatment. In addition, it has been reported that hostility, anger, and aggression in eating disorders can lead to self-harming behavior and suicide.<sup>1</sup> It is important to consider in clinical practices the role of emotional eating, which we can think of as coping with these negative internal stimuli, in the relationship between disordered eating attitudes and thoughts related to hostility.

It is emphasized that eating disorders have increased over the years,<sup>38</sup> and that one of the main factors causing the increasing obesity and overweight rates in the United States is emotional eating. In Turkey, even though the point prevalence of eating disorders was 1.55%,<sup>5</sup> there is no evidence that shows rates of emotional eating or any fluctuation over years. Research on emotional eating and its causes may be useful in preventing obesity and planning health interventions.<sup>39</sup> On the other hand, in a study conducted in the Netherlands, as a result of case observations at the Lentis Mental Health Center, anger and aggression problems were considered underlying causes of eating disorders, and the psychomotor therapy method was applied in order for the clients to gain awareness of their anger and aggression problems and to cope with them. It was concluded that after therapy, improvement in eating disorders was better in the therapy group than in the control group.<sup>40</sup> As revealed in this research, it may be recommended that intervention methods of the psychomotor therapy method, which remove emotional eating and enable coping with these negative emotions more functionally, be added to the protocol and disseminated. It is recommended that both thoughts related to hostility, which are assumed to trigger anger<sup>2</sup> and characteristics of emotional eating behavior should be addressed in different preventive studies and intervention programs.

The research has several limitations. The fact that the majority of the participants were female reduces the generalizability of the research. Secondly, the data obtained based on self-report may have been affected by the social desirability of the participants. Another important limitation is body mass index values, psychiatric history, metabolic disorders, and medication use, which may accompanied by disordered eating attitudes, were not measured and controlled in the study. Finally, the fact that the data was collected during the COVID-19 pandemic period suggests that it may have been affected by the disordered eating attitudes that increased during that period.

## CONCLUSION

To conclude, it is important to address hostility and emotional eating behavior when disordered eating attitudes are aimed to enhanced. Both preventive studies and intervention programs may be developed by clinical psychologists to address hostile cognitions, before emotional eating occurs and disordered eating attitudes, especially bulimia / preoccupation with eating thereafter. Future studies should be addressed with specific patient group in which disordered eating attitudes occur. Collaborative work should be done among health sciences professions to improve disordered eating attitudes.

## ETHICAL DECLARATIONS

**Ethics Committee Approval:** The study was carried out with the permission of İstanbul Arel University Ethics Committee (Date: 26.02.2020, Decision No: 2020-15).

**Informed Consent:** The informed consent form were delivered to the participants via Google Forms and they responded with click-through.

**Referee Evaluation Process:** Externally peer reviewed.

**Conflict of Interest Statement:** The authors have no conflicts of interest to declare.

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**Author Contributions:** All the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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