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**Interpersonal Cognitive Distortions:  
What is the Role of Childhood Trauma  
and Attachment?**

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## Interpersonal Cognitive Distortions: What is the Role of Childhood Trauma and Attachment?

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### Abstract

The aim of this study is to investigate the mediating role of attachment styles in the relationship between childhood trauma and cognitive distortion. The sample comprised 358 (44.7 % males) university students. Participants completed the Childhood Trauma Questionnaire, the Three-Dimensional Attachment Style Scale, and the Interpersonal Cognitive Distortions Scale. According to the results, other variables, except for physical neglect, did not differ in terms of gender. According to other results of the research, childhood trauma and anxious attachment predicted interpersonal cognitive distortions. In addition, anxious attachment mediated the relationship between childhood trauma and interpersonal cognitive distortions. These findings provide evidence that childhood trauma, mediated by anxious attachment, might contribute to interpersonal cognitive distortions in adulthood. However, secure and avoidant attachment had no statistically meaningful direct impact on interpersonal cognitive distortions. Findings were discussed in line with the relevant literature and some suggestions were presented to the researchers in the context of planning treatment, including assessment of prognosis and treatment needs.

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### Introduction

Some childhood traumas are based on experiences of preadolescence abuse and neglect (Ballard et al., 2015). The majority of individuals with psychological disorders caused by trauma experience abuse before they were in adolescence (Black et al., 2012). Childhood trauma may cause some psychiatric disorders such as depression (Gladstone et al., 2004), post-traumatic stress disorder (PTSD) (Perry et al., 1995), and obsessive-compulsive disorder (Carpenter & Chung, 2011; Lonchner et al., 2002), but it also affects health problems in daily life such as addiction, risky sexual behavior and obesity (Hillis et al., 2001). Moreover, childhood trauma was examined with both adult attachment styles (Kong et al., 2018; Purnell, 2010) and interpersonal cognitive distortions such as unrealistic relationship expectation in interpersonal relationships, current perceptions of hopelessness and helplessness, and avoidance of intimacy (Briere & Elliott, 1994; Browne & Winkelman, 2007; Owens & Chard, 2001; Strickland, 2008).

It is quite prevalent to experience cognitive distortions after traumatic events (Daniels et al., 2011). Cognitive distortions are defined as systematic errors that lead to misunderstandings (Beck & Weishaar, 2008). Interpersonal cognitive distortions, on the other hand, are assessed as rigid, exaggerated, illogical, and perfectionist thoughts in the relational process (DiGiuseppe & Zee, 1986). Trauma in early life can impair regulation of emotions, coping with stressful stimuli, development of the capacity to maintain interpersonal relationships, and triggers psychobiological alterations that affect emotions and cognition (Schore, 2001). Therefore, it can be said that childhood trauma has profound impact on cognitive functions (Berthelot et al., 2015; Perry et al., 1995). In other words, childhood trauma distorts the victims' cognition (Briere, 1996). In this process, childhood traumas can cause distortion of cognition by distorting assumptions about both the future/the environment and themselves/others. Accordingly, it is known that interpersonal cognitive distortions associated with internal attribution (self-criticizing and self-blaming), perceptions of hopelessness and helplessness, and worry about danger are related to childhood trauma (Briere, 1996).

In addition to interpersonal cognitive distortions having a tendency to recur with high periodicity and persist for a long time, they are very difficult to control (Weismore & Esposito-Smythers, 2010). Therefore, victims of childhood trauma experience lifelong difficulties related to addiction and cognitive distortions in their relationships (Lawson & Quinn, 2013). Victims experience more interpersonal problems due to these lifelong difficulties (Huh et al., 2014). Briere and Elliott (1994) also suggest that childhood abuse is a significant risk factor for various problems, and this abuse affects a number of broad categories such as interpersonal cognitive distortions and interpersonal difficulties. In this context, childhood traumas can cause interpersonal cognitive

distortions in interpersonal relationships. When the literature is examined, there are many studies examining both direct and indirect effects of childhood trauma on interpersonal cognitive distortions. Studies examining direct effects found that childhood trauma is related to interpersonal problems owing to cognitive distortions (Huh et al., 2014; Williams et al., 2012). In studies examining indirect effects, it seems that interpersonal cognitive distortions play a mediating role in the relationship between childhood traumas and non-suicidal self-injury (Weismore & Esposito-Smythers, 2010) and the relationship between psychological distress and PTSD on individuals with childhood trauma experiences (Fang & Chung, 2019). According to another study examining the indirect effects, both cognitive distortions and attachment have a mediating role in the relationship between childhood trauma and psychological adjustment (Browne & Winkelman, 2007). Other studies with mediation by attachment examined the relationship between adult dissociation and childhood trauma (Kong et al., 2018) and between childhood trauma and obsessive-compulsive disorder (Carpenter & Chung, 2011). It is known that individuals with childhood trauma experience more insecure attachment in young adulthood, and different attachment styles can involve varying cognitive distortions (Purnell, 2010). Considering whether young adults have secured or insecure attachment, this study deals with the mediating role of attachment styles between childhood trauma and interpersonal cognitive distortions.

Attachment affects perception of the outside world and the relationships. Thus, it creates dynamic mental representations of others and self (Kong et al., 2018). As attachment mechanisms are also encountered in later stages of life, secure or insecure attachment styles are also observed in adults. Insecure attachment styles in adults can be classified as avoidance and anxiety dimensions (Mikulincer & Shaver, 2008). Attachment avoidance means a degraded tolerance for interpersonal intimacy and importance given to autonomy. Attachment anxiety is characterized by a remarkable need for interpersonal intimacy and worry related to self-worth (Kong et al., 2018). In the literature, trauma in itself does not lead to insecure attachment. In the other word, childhood traumas may be one of the effective factors in their experience of insecure attachment. Children who encounter a traumatic situation will have secure attachment styles in the future when they think that they are protected against dangers by their caregivers (Purnell, 2010). In addition, trauma experienced in situations where the object bond to the caregiver is weak affects attachment disorders in the later stages of life (Schore, 2001).

Childhood trauma and insecure attachment may later cause dysfunctional cognitions (Spangler & Grossmann, 1999). Furthermore, since it is known that insecure attachment has an effect on the individual's negative self-evaluation, constant blaming, and repeating this process (Bockers et al., 2014), individuals with this attachment style tend to create interpersonal cognitive distortions by evaluating themselves negatively. In the study conducted by Browne and Winkelman (2007), childhood trauma affected attachment and interpersonal cognitive distortions were the only variable predicting trauma symptoms in later life for adults who reported experiencing childhood trauma. Accordingly, we suggest that attachment styles may describe how childhood trauma causes interpersonal cognitive distortions in young adults. In addition, we think that the gender factor may also have an impact on this process.

It is seen that there are different results in terms of gender in attachment, childhood traumas and interpersonal cognitive distortions. Among these, in the literature, there are different results in terms of gender regarding childhood traumas, and in some studies males (Charak & Koot, 2014; Choo et al., 2011; Jirapramukpitak et al., 2005; Zeren et al., 2012) and in some other studies women (James et al., 2016; Murty et al., 2003) are exposed to more abuse and neglect during childhood. In some studies, it has been determined that childhood traumas do not differ in terms of genders (Godinet et al., 2014; Grilo & Masheb, 2001). When the types of childhood traumas are examined in the relevant literature, it was seen that childhood traumatic experiences, physical neglect, physical abuse, emotional abuse, and sexual abuse can be experienced by both women (Meyerson et al., 2002; Stoltenborgh et al., 2011; Tang, 2002) and men (Güneri Yöyen, 2017; Kalkan & Özbek, 2011; Sofuoğlu et al., 2014; Thompson et al., 2004). Although it is seen in some studies mentioned above that men or women experience higher levels of childhood neglect and abuse, it is known that men report such negative experiences more and silence themselves less (Power et al., 2016).

In the literature, it is known that interpersonal cognitive distortions have different results in terms of genders. For example, while women experience higher scores on irrational beliefs, approval and addiction subscales, men have a higher tendency to blame (Ganong & Coleman, 1992). However, it is noteworthy in studies that generally men have more interpersonal cognitive distortion (Al-Salameh, 2011; Avcı Çayır & Kalkan, 2018; Çam & Şahin Çelik, 2018). In addition, there are also studies revealing that there is no significant difference between interpersonal cognitive distortion scores according to gender (Çoban & Karaman, 2013; Demir & Kaya, 2016). When the attachment literature was examined in terms of genders, it was seen that there were also different results. For example, in some studies men (Barry et al., 2015; Del Giudice, 2011; Weber et al., 2022; Wongpakaran et al., 2012) scored higher, while women (Li et al., 2019) scored higher in some other studies.

Similarly, there are studies showing that both men (Wongpakaran et al., 2012) and women (Del Giudice, 2011; Li et al., 2019; Weber et al., 2022) have higher scores in the anxiety dimension. On the other hand, it was determined that there were no differences between men and women in their secure or fearful ratings (Bartholomew & Horowitz, 1991), anxiety dimension (Barry et al., 2015; Shu et al., 2017), avoidance dimension (Shu et al., 2017). Similarly, no gender differences were found in the dismissive and preoccupied attachment dimensions (Bakermans Kranenburg & van IJzendoorn, 2009). In this context, it is noteworthy that the variables in question show different results in terms of gender. Therefore, in the current study, which will examine whether attachment has a mediated role in the relationship between childhood trauma and interpersonal cognitive distortion, the role of gender has been a matter of curiosity.

Basically, cognitive theory states that people's emotions and behaviors are affected by the way they interpret events. According to this theory, the factor that determines the emotions of individuals is not the event itself, but the meaning ascribed to the event in one's own thought system (Beck, 1995). The interpersonal schema that emerges in the early period, as a representation of the interaction between the self and others, guides the later relationships. Due to these schemas, the individual often has difficulty adapting to new situations and creates repetitive cycles in interpersonal relationships. These cycles, on the other hand, cause repetitive, maladaptive and dysfunctional behaviors to emerge continuously (Safran & Segal, 1996). Based on these considerations, schemas are formed on the basis of the individual's relationship with the attachment figure in the early period. Psychologically healthy people tend to have interpersonal schemas without risk the interpersonal relationship. In some cases, the individual may constantly react in a maladaptive way due to dysfunctional expectations of others' interpersonal behavior (Young et al., 2003). As a result, according to both attachment theorists (Bartholomew & Horowitz, 1991) and those adopting the cognitive approach (Beck, 1995), the experiences of individuals in the early period affect the interpersonal relationships in the later stages of their lives. In addition, gender theorists emphasize that men and women are different in relational processes and intimate relationships, and they argue that this process is dynamic (Fivush, 2002). Studies have generally shown that attachment style has an effect on interpersonal cognitive distortions (Gamble & Roberts, 2005; Rogers et al., 2019; Stackert & Bursik, 2003) and that attachment plays a mediating role between childhood traumas and cognitions (Carpenter & Chung, 2011). While prior works have examined childhood traumas and cognitions (Carpenter & Chung, 2011; Huh et al., 2014; Williams et al., 2012), no studies have tested the mediating role of attachment between childhood trauma and interpersonal cognitive distortions and examined these variables in terms of gender. The current study addresses this gap in the literature. Based on the literature, there are three research questions in the study.

1. Do childhood trauma, interpersonal cognitive distortions and attachment differ according to gender?
2. Is there a relationship between childhood trauma and interpersonal cognitive distortions?
3. Does attachment play a mediating role in the relationship between childhood trauma and interpersonal cognitive distortions?

## Method

### Study Design

For the purpose of the study, the parallel mediation model regarding the mediating roles of attachment styles in the relationship between childhood maltreatment and interpersonal cognitive distortions were tested (Figure 1).

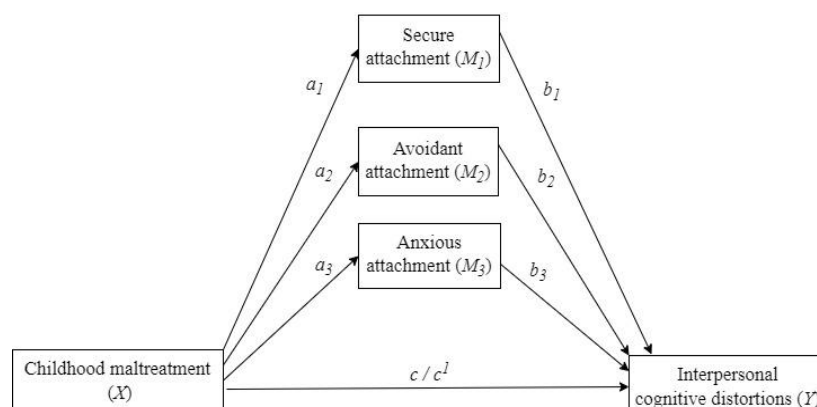


Figure 1. Mediating effect of attachment styles

## Participants

The convenience sampling method was used to choose the students to participate in the study. Convenience sampling is a type of sampling used in situations where random or non-random sampling is difficult. The group in this sample has the feature of being easily accessible (Fraenkel et al., 2012). In this study, there were 358 (44.7 % males) students at university with an average age ( $Mean = 20.27$ ,  $SD = 1.50$ ). Of the participants, 85 (23.70 %) people received psychological support before or ongoing, 273 (76.30 %) people did not receive psychological support. In addition, 36 (10.10 %) of the participants stated that they used a psychiatric drug before and 322 (89.90 %) of them stated that they did not use any psychiatric medication.

## Procedure and Ethical Approval

This study was conducted in accordance with the 1975 Helsinki Declaration. After the required permission and ethics committee approval were completed, the researchers announced via a brochure that a scientific study was carried out in the places where the students were concentrated and that volunteer participants were sought. The brochure included information about who did the study, whom it would be carried out, between which dates it continued, and how to access the research. Then, in the prepared form, it was accepted to participate in the study voluntarily by ticking a box of informed consent. The information was presented in Turkish. In addition, the study was conducted face-to-face in the campus of the university. In other words, the forms were applied to the students who wanted to participate in the study voluntarily, both in the office environment and in the campus areas, by means of paper and pencil. Then, the students participating in the study signed the consent form.

## Measures

### *Sociodemographic Data Form*

This form developed by the researchers recorded individuals' age, gender, whether they had a traumatic experience with any person, whether they received any psychological help, and whether they took any medication therapies. Since it is assumed that the university where the participants are located is not heterogeneous in terms of ethnicity, questions regarding ethnicity or race were not asked to the participants.

### *Childhood Trauma Questionnaire (CTQ)*

CTQ is a self-report scale designed by Bernstein and Fink (1998) to evaluate experiences of abuse and neglect. It is a 5-point grading type scale consisting of 25 items in total. Each item on the CTQ is scored via a 5-point Likert scale (1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = very often true). There are 5 dimensions in the scale: emotional abuse (i.e., "I thought that my parents wished I had never been born"), physical abuse (i.e., "I believe I was physically abused"), physical neglect (i.e., "I didn't have enough to eat"), emotional neglect (i.e., "I felt loved (R)."), and sexual abuse (i.e., "I believe that I was sexually abused"). Total scores for each scale range from 5 to 25, with higher scores indicating greater severity of abuse. Child maltreatment severity was calculating by summing all categories of maltreatment (e.g., Ernst et al., 2022; Powers et al., 2021; Rek et al., 2022). The Turkish adaptation of the scale was carried out by Şar et al. (2012) on a clinical and non-clinical sample group. As a result of the adaptation study, it was determined that the scale was validated with a Turkish sample. As a result of the reliability analysis of the scale, Cronbach's alpha was 0.93 (Şar et al., 2012). In this study, the Cronbach's alpha was 0.72.

### *Three-Dimensional Attachment Style Scale (TDASS)*

The 18-item self-report measure of TDASS is scored via a 5-point Likert scale (1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = very often true). The scale consists of three factors: secure attachment, avoidant attachment, and anxious attachment (Erzen, 2016). Avoidant attachment style determines attitudes in which the individual rejects the value of others by keeping self-worth high. For example, 'The people around me are not as valuable as me'. In the secure attachment style, individuals consider both themselves and the others as valuable assets. For example, 'I can understand the sadness of others'. The third dimension, anxious attachment, consists of a combination of fearful preoccupied attachment styles. In other words, it includes the attitudes of both wanting to be together with the individuals in front of them by assessing themselves as worthless and

avoiding being together with them due to the harm that may come from them. For example, 'I stay away from people because they can make me suffer'. High scores obtained from each factor mean that the relevant attachment style is highly displayed, lower scores indicate less display of that style. As a result of the reliability analysis of the scale, the Cronbach alpha values were found to be 0.69 for the secure attachment, 0.80 for the avoidant attachment and 0.71 for the anxious attachment (Erzen, 2016). In this study, the Cronbach alpha values were 0.62, 0.64, and 0.63.

#### *Interpersonal Cognitive Distortions Scale (ICDS)*

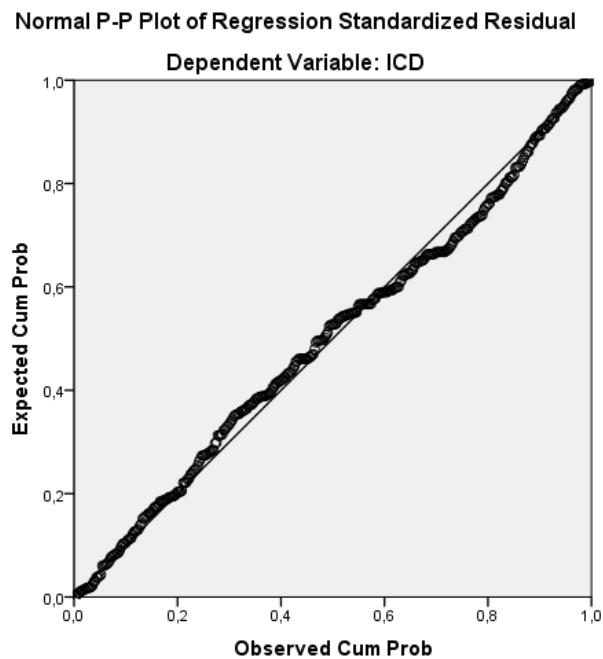
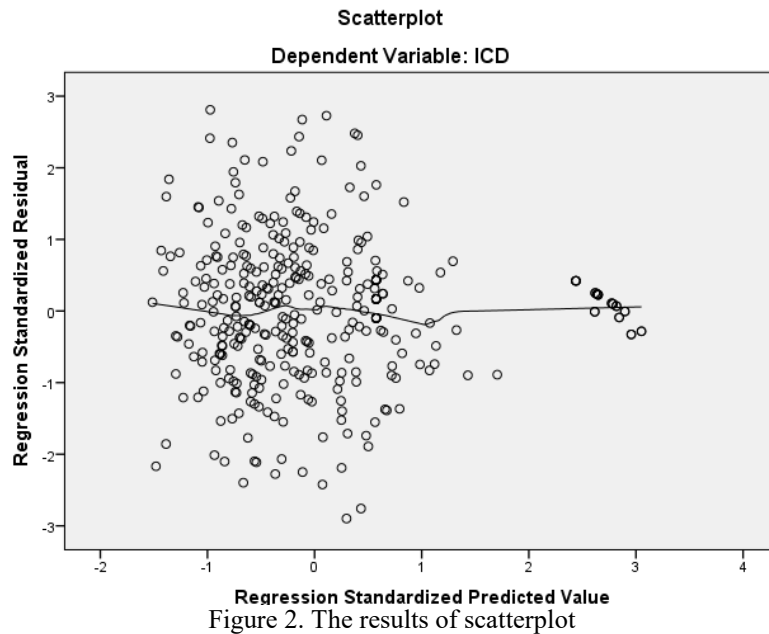
ICDS was developed by Hamamcı and Büyüköztürk (2004) to assess the cognitive distortions that individuals have in their interpersonal relationships. The ICDS was developed as 19 items rated on a 5-point Likert scale (1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = very often true). There are three sub-scales: interpersonal rejection, unrealistic relationship expectation and interpersonal misperception. The sample item is 'There are no real friends in this life' for the interpersonal rejection sub-dimension, the item 'I always want somebody to be around me' for the unrealistic relationship expectation sub-dimension, and the item 'I feel what they think even if people do not show it' for the interpersonal misperception sub-dimension. As a result of the sum of the three dimensions of the scale, the total score of interpersonal cognitive distortions is obtained. The high total scores indicate that interpersonal cognitive distortions are high. The reliability of the scale was estimated by performing a test-retest correlation (0.74) and Cronbach alpha was 0.67 (Hamamcı & Büyüköztürk, 2004). In the present study, Cronbach alpha was 0.74.

#### **Analysis of Data**

First, the data set was checked in terms of data entered using frequency, minimum and maximum values. Afterward, the variables examined in the study were tested whether they showed a difference in terms of gender. As seen in Table 1, the variables showed a normal distribution. At this point, the independent samples t-test, which is one of the parametric tests, was employed to test the variables whether they showed differences in terms of gender. Mediation analyses were performed on SPSS Version 23 (IBM Corp., 2015) and the PROCESS macro (model 4) for SPSS (Hayes, 2013), which employs a regression-based approach to mediation. We tested various assumptions of this test before starting the regression-based mediation test. In the literature, these assumptions are expressed as linearity, homoscedasticity, normality of estimation error, and independence of observation (Hayes, 2013).

A loess curve was added to the scatter plot to test linearity and homoscedasticity assumptions. It is a way of installing a non-parametric curve between variables to show the relationship between them (Jacoby, 2000). As can be seen in Figure 2, the regression appears fairly linear since the Loess curve centres close to zero along the entire X axis. As seen in Figure 2, it was determined that the data did not form a clear pattern in the scatter plot. In other words, the data spread evenly along the X-axis. This shows that the homoscedasticity assumption was met. Also, the assumption of the normality of estimation error was examined with the Q-Q plot with the residuals (Figure 3). Our data were found to have a good fit with the diagonal line, which showed normality. In addition, the skewness and kurtosis values were examined for normality. Because of having the skewness and kurtosis values between  $\pm 3$  and  $\pm 10$  for normality (Kline, 2016), the data showed normal distribution. The analysis results should not be influenced in cases of minor violations of this assumption, except that the study has a small sample size (Hayes, 2013). Finally, the independence of observations was tested. The error related to each data point (i.e., one case) should not have a connection with the error of other cases (Hayes, 2013). This particularly applies to studies that use cluster sampling procedures or dyadic data research (Hayes, 2013), in which cases may be interrelated as they share some characteristics or context. In the case of nonindependence of observations, a smaller or larger standard error of the regression coefficients can be seen (Hayes, 2013). Whether data meets the independence assumption can be determined provided that the data collection method is known. As we recruited our subjects from a pool of undergraduate students at the same university, we are not expecting to have underlying common characteristics that might compromise the independence of our estimation error.

Correlation analysis was used to determine the relationships between variables. Then, the mediating role of attachment styles between childhood trauma and interpersonal cognitive distortions related to relationships was tested with the PROCESS macro for SPSS. In testing the significance of mediation analysis, the sample size was tested with the reconstructed bootstrap method as 10000 at 95% confidence interval. Thus, more reliable results were obtained by performing analyses on larger data sets produced by resampling (MacKinnon et al., 2004).



## Results

### Gender Differences

The independent samples t-test was used to test whether the variables examined in the study showed a difference in terms of gender. According to the t-test results, there was a significant difference between males and females in terms of physical neglect [ $t(356) = -2.267$ ;  $p = 0.024$ ]. Accordingly, the examination of Table 1 shows that male participants ( $Mean = 7.485$ ;  $SD = 2.241$ ) reported a higher mean score than female participants ( $Mean = 6.878$ ;  $SD = 2.591$ ) in terms of exposure to physical neglect. On the other hand, it was found that emotional neglect [ $t(356) = -0.828$ ;  $p = 0.404$ ], emotional abuse [ $t(356) = 0.224$ ;  $p = 0.823$ ], physical abuse [ $t(356) = 0.125$ ;  $p = 0.900$ ], sexual abuse [ $t(356) = 1.649$ ;  $p = 0.100$ ], total childhood maltreatment [ $t(356) = -0.496$ ;  $p = 0.620$ ], interpersonal cognitive distortions [ $t(356) = -0.693$ ;  $p = 0.489$ ], avoidant attachment [ $t(356) = -1.152$ ;  $p = 0.129$ ], secure attachment [ $t(356) = -1.412$ ;  $p = 0.159$ ], and anxious attachment [ $t(356) = -0.024$ ;  $p = 0.981$ ] did not differ in terms of gender.

**Correlational Statistics**

The correlation values in the study and the descriptive statistical values of the variables are presented in Table 1.

Table 1. Mean scores and zero-order correlations

	1	2	3	4	5	6	7	8	9	10
1. Emotional abuse (CTQ)	0.558#									
2. Physical abuse (CTQ)	0.499#	0.457#								
3. Sexual abuse (CTQ)	0.271#	0.285#	0.347#							
4. Emotional neglect (CTQ)	0.669#	0.466#	0.402#	0.381#						
5. Physical neglect (CTQ)	0.825#	0.695#	0.695#	0.648#	0.816#					
6. Total childhood maltreatment (CTQ)	-0.554#	-0.570#	-0.429#	-0.272#	-0.511#	-0.620#				
7. Secure attachment (TDASS)	0.592#	0.421#	0.360#	0.215#	0.532#	0.578#	-0.322#			
8. Avoidant attachment (TDASS)	0.586#	0.442#	0.434#	0.225#	0.485#	0.585#	-0.370#	0.817#		
9. Anxious attachment (TDASS)	0.577#	0.491#	0.420#	0.323#	0.491#	0.620#	-0.392#	0.551#	0.595#	
10. Interpersonal cognitive distortions (ICDS)	7.096	5.651	6.010	7.873	6.878	33.510	15.838	18.414	19.994	55.368
<i>Female Mean</i>	2.943	1.519	1.895	2.602	2.591	9.089	3.234	5.340	4.660	11.389
<i>Female SD</i>	1.434	2.667	1.607	0.788	1.459	1.573	-1.281	0.804	0.654	0.351
<i>Skewness</i>	0.829	8.199	1.071	0.274	0.913	1.581	1.197	-0.243	-0.352	-0.603
<i>Kurtosis</i>	7.031	5.631	5.693	8.106	7.487	33.950	16.281	19.243	20.006	56.125
<i>Male Mean</i>	2.422	1.519	1.686	2.688	2.441	7.326	2.557	4.845	4.115	8.676
<i>Male SD</i>	1.216	3.018	2.614	0.999	0.766	1.539	-1.501	0.246	0.447	-0.075
<i>Skewness</i>	0.843	10.668	6.102	0.594	-0.471	3.013	3.105	-0.755	-0.452	0.104
<i>Kurtosis</i>	7.067	5.642	5.868	7.977	7.150	33.706	16.036	18.784	20.000	55.706
<i>Total Mean</i>	2.719	1.517	1.809	2.639	2.540	8.339	2.955	5.134	4.419	10.259
<i>Total SD</i>	5.000	5.000	5.000	5.000	5.000	25.000	8.00	7.00	11.00	29.00
<i>Minimum</i>	15.00	15.00	13.00	17.00	14.00	60.000	22.00	34.00	30.00	77.00
<i>Maximum</i>	1.39	2.81	1.98	0.89	1.13	1.564	-1.40	0.57	0.58	0.22
<i>Skewness</i>	0.97	9.15	2.67	0.43	0.15	2.058	1.93	-0.52	-0.36	-0.33
<i>Kurtosis</i>										

Note: # p < .001



Parallel Mediation Results

Results of regression analyses, examining direct and mediation effects and controlling for gender, are presented in Table 2.

Table 2. Direct and indirect effects

IV: Childhood maltreatment		DV: Interpersonal cognitive distortions			
Gender (control variable)	B	SE	$\beta$	t	p
Childhood maltreatment to secure attachment (path a <sub>1</sub> )	-0.443	0.812	-0.021	-0.545	0.585
Childhood maltreatment to avoidant attachment (path a <sub>2</sub> )	-0.220	0.014	-0.622	-15.031	<.001
Childhood maltreatment to anxious attachment (path a <sub>3</sub> )	0.354	0.026	0.576	13.336	<.001
Secure attachment to interpersonal cognitive distortions (path b <sub>1</sub> )	0.310	0.022	0.585	13.591	<.001
Avoidant attachment to interpersonal cognitive distortions (path b <sub>2</sub> )	-0.054	0.173	-0.015	-0.312	0.754
Anxious attachment to interpersonal cognitive distortions (path b <sub>3</sub> )	0.140	0.139	0.070	1.005	0.315
Total effect of childhood maltreatment (path c)	0.701	0.162	0.302	4.316	<.001
Direct effect of childhood maltreatment (path c')	0.762	0.051	0.619	14.888	<.001
	0.483	0.071	0.392	6.734	<.001
$F(5, 352)=62.161, R^2=0.468, p < .001$					
Bootstrap results for indirect effects					
	Effect	SE	Lower CI	Upper CI	
Childhood maltreatment to interpersonal cognitive distortions via secure attachment	0.012	0.036	-0.062	0.082	
Childhood maltreatment to interpersonal cognitive distortions via avoidant attachment	0.049	0.055	-0.062	0.155	
Childhood maltreatment to interpersonal cognitive distortions via anxious attachment	0.217	0.063	<b>0.100</b>	<b>0.346</b>	

Notes: Statistical significance indicated in bold. Gender: 1 for females, 0 for males. CI = 95% percentile bootstrap confidence interval. Bootstrapping process was confirmed with 10,000 bootstrap samples.

A significant indirect effect was found for childhood maltreatment, in that the relationship between childhood maltreatment and interpersonal cognitive distortions was mediated by anxious attachment. The completely standardized indirect effect of childhood maltreatment was estimated as  $(ab) = 0.176$ ,  $SE = 0.051$ , 95% CI [0.084, 0.282], indicating that a one standard deviation increase in severity of childhood maltreatment would yield a 0.176 standard deviation increase in interpersonal cognitive distortions severity through the mediating effect of anxious attachment. On the other hand, it was found that secure attachment and avoidant attachment did not have a mediating role in the relationship between childhood maltreatment and interpersonal cognitive distortions. In line with the purpose of the study, the parallel mediation results regarding the mediating roles of attachment styles in the relationship between childhood maltreatment and interpersonal cognitive distortions are shown in Figure 4.

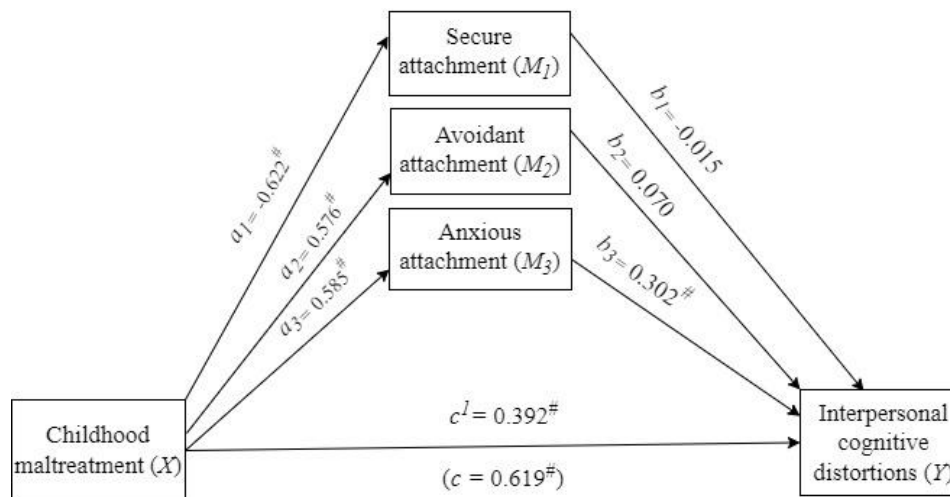


Figure 4. Results of parallel mediation

Note:  $c^I$  is direct effect of childhood maltreatment on interpersonal cognitive distortions,  $c$  is total effect of childhood maltreatment on interpersonal cognitive distortions,  $\# p < .001$ .

## Discussion

### Gender Differences

The primary aim of the study was to examine whether childhood traumas, interpersonal cognitive distortions, and attachment styles differed in terms of gender. As a result of the research, it was found that the levels of emotional neglect, emotional abuse, physical abuse, sexual abuse and total childhood maltreatment did not differ according to gender and that the dimension of physical neglect differed in favour of men. A review of the literature indicated that there were studies showing that boys were physically abused more than girls (Malgaz Güçlü & Acemioğlu, 2020; Metin et al., 2021; Sofuoğlu et al., 2014; Thompson et al., 2004). However, there were also studies that showed results different from those of the current research. In these studies, it was revealed that girls were exposed to more abuse and neglect in their childhood (Çöpür et al., 2012; James et al., 2016; Murty et al., 2003; Sofuoğlu & Nalbantçılar, 2018; Topal et al., 2018; Zoroğlu et al., 2001). On the other hand, there were some studies indicating that there were no differences between males and females in terms of physical abuse (Bostancı et al., 2006; Çeçen-Eroğul & Türk, 2013; Güneri Yöyen, 2017; Kalkan & Özbek, 2011; Meyerson et al., 2002; Stoltenborgh et al., 2013). In addition, some studies showed that boys in general were exposed to more abuse and neglect during childhood (Charak & Koot, 2014; Choo et al., 2011; Jirapramukpitak et al., 2005; Zeren et al., 2012) and that they experienced more physical neglect and sexual abuse than female students (Güneri Yöyen, 2017). Some other studies showed that males were more likely to report emotional abuse and sexual abuse (Çeçen-Eroğul & Türk, 2013; Kalkan & Özbek, 2011) and more emotional neglect than females (Power et al., 2016). On the other hand, interpersonal cognitive distortions did not differ in terms of gender in this study. When the literature was examined, it was seen that there were studies with similar results (Çoban & Karaman, 2013; Demir & Kaya, 2016). In addition to studies showing that females had higher irrational beliefs (Ganong & Coleman, 1992; Şahan & Eraslan Çapan, 2017), there were studies indicating that male students had higher irrational beliefs (Al-Salameh, 2011; Avcı Çayır & Kalkan, 2018; Çam & Şahin Çelik, 2018).

In addition, it was determined that there was no difference between genders in terms of avoidant attachment, secure attachment, and anxious attachment. When the literature was examined, it was seen that there were studies showing similar results (Bakermans-Kranenburg, & van IJzendoorn, 2009; Barry et al., 2015; Bartholomew & Horowitz, 1991; Shu et al., 2017). In addition to these studies, there were other studies with results that were not consistent with the results of the present study. These studies showed that males had higher scores on the avoidance dimension than females (Barry et al., 2015; Del Giudice, 2011; Li et al., 2019; Weber et al., 2022; Wongpakaran et al., 2012) or females had higher scores on the avoidance dimension (Li et al., 2019), males scored significantly lower than women on the anxiety dimension of attachment (Del Giudice, 2011; Li et al., 2019; Weber et al., 2022), or that males scored higher than females on the same dimension (Wongpakaran et al., 2012).

### **Parallel Mediation**

This study was performed with the purpose of examining the mediating role of avoidant attachment, secure attachment, and anxious attachment on the relationship between childhood trauma and interpersonal cognitive distortion. It was found that the anxious adult attachment style partially explains the interpersonal cognitive distortions in adults with a history of childhood trauma, but the avoidant adult attachment style and secure attachment style do not explain the relationship between childhood traumas and interpersonal cognitive distortions in these adults.

Findings regarding the first hypothesis of the study showed that individuals with high levels of childhood trauma have more interpersonal cognitive distortion. This finding is similar to many studies. Perry et al. (1995) suggested that childhood trauma has a profound effect on behavioral, emotional, physical, social and cognitive functions. In the study conducted by Briere (1996), cognitive distortion regarding internal attribution, perceptions of hopelessness and helplessness, and worry about danger were seen to be associated with childhood trauma. Purnell (2010) also reported that individuals with trauma have more cognitive problems. In this context, it can be said that childhood trauma impairs cognition (Briere, 1996). As a result, this finding in the current study is in parallel with many studies in the literature (Briere & Elliott, 1994; Daniels et al., 2011; Huh et al., 2014; Lawson & Quinn, 2013).

The mediation hypothesis of the study was that childhood traumatic experiences of adult individuals would have indirect effects on their interpersonal cognitive distortion levels through attachment styles. Research findings revealed that adults with childhood traumatic experiences have less secure attachment styles, on the other hand, they have more anxious and avoidant attachment styles. On the other hand, it was determined that adult individuals who had a traumatic experience in childhood had more anxious attachment style, and at the same time, their interpersonal cognitive distortion levels increased indirectly. Contrary to this situation, it was determined that the individuals had more avoidant attachment style, but there was no increase in the interpersonal cognitive distortion levels indirectly. Similarly, it was determined that adult individuals with childhood traumatic experiences had less secure attachment styles, but there was no increase in the levels of interpersonal cognitive distortions indirectly. As a result, anxious attachment mediates the relationship between childhood trauma and interpersonal cognitive distortion. It was found that individuals with high levels of childhood trauma experience higher levels of anxious attachment, resulting in higher interpersonal cognitive distortions. According to Purnell (2010), this is the result of past traumas keeping the individual vigilant to danger by weakening attachment and then developing an insecure attachment style and experiencing cognitive distortion and arousal in this process. The result obtained from the current study is similar to many studies. In the study conducted by Kong et al. (2018), path analysis of trauma subtypes found that anxious attachment mediated the relationship between childhood emotional abuse, physical abuse, and physical neglect and adult dissociation. Considering that it is possible to have thoughts about relationships in the process of adult dissociation, it can be said that this study is similar to the current study. Moreover, the current study is similar to the study by Carpenter and Chung (2011), which found that insecure attachment plays a mediating role in the relationship between childhood trauma and obsessive-compulsive disorder. Considering that obsessive-compulsive disorder also has false cognitions, the related study partially supports the current study because it was observed that anxious attachment was a mediator in the current study while avoidant attachment mediated in the study by Carpenter and Chung (2011). Although both are types of insecure attachment, it can be said that this study partially differs from the current study. In another study, the effects of attachment styles and personality organization on emotional functioning were examined in those who experienced childhood trauma, and it was determined that childhood traumas increase anxious attachment and indirectly experience more feelings of sadness and care (Fuchshuber et al., 2019).

Similarly, anxious attachment is reported to be mediator of the effect of childhood trauma on relational domains, identity integration, and self-control (Cohen et al., 2017). In addition, according to Tasca et al. (2011), individuals with childhood trauma and anxious attachment style should focus on protecting self-integrity in identity development to obtain the desired results from treatment. When the identity literature is examined, it is known that there is a sense of continuity with past life in an integrated identity, negative emotions such as regret and despair are accepted (Marcia, 2014), and there is integrity between beliefs, values and thoughts (Adams & Marshall, 1996).

In addition to these findings, there are studies showing that as the anxious attachment levels of individual's increase, dysfunctional attitudes (Andersson & Perris, 2000) and interpersonal problems (Stepp et al., 2008) also increase. The results of a similar study showed that anxious attachment positively predicted unrealistic relationship expectation and mind reading sub-dimension of interpersonal cognitive distortions (Deveci Şirin, 2017). In addition, it has also been found that anxious attachment leads to an increase of cognitive distortions (Rogers et al., 2019). On the other hand, trauma itself does not determine attachment style and can only be considered a factor when trauma is an integral part of the pattern of interaction with the primary caregiver. Therefore, it can be said that individuals who have experienced childhood trauma may act with more insecure attachment to other people in adulthood, and thus they may have more interpersonal cognitive distortion.

Furthermore, the current study findings indicate that avoidant attachment and secure attachment do not mediate the relationship between childhood trauma and interpersonal cognitive distortion. In other words, individuals with high levels of childhood trauma have higher levels of avoidant attachment and lower secure attachment; however, it was observed that there was no change in the interpersonal cognitive distortion of these individuals. In parallel with the literature, childhood trauma increases avoidant attachment (Browne & Winkelmann, 2007; Carpenter & Chung, 2011). In addition, it is suggested that childhood trauma reduces secure attachment (Erozkan, 2016). These studies support the current study about the direct effect of childhood trauma; on the other hand, they differ in relation to the indirect effect findings.

In the current study, there may be some reasons why only anxious attachment is mediated. This study was primarily conducted on individuals exposed to interpersonal trauma. The study also focuses not on cognitive distortions in general, but on a more specific case of cognitive distortions in interpersonal relationships. However, the original three-dimensional attachment styles scale (Erzen, 2016) was developed on a normal sample aged between 12 and 25 years (history of traumatic experience was not questioned). Current study, on the other hand, shows slightly different characteristics than the normal sample. In general, it was determined that insecure attachment levels of current study were higher than the study of the conducted by Erzen (2016). For this reason, it is thought that the reason for such a difference may be sample differences. In addition, since extremely rigid, exaggerated, irrational and perfectionist thoughts in social relations affect how the individual will behave in intimate relationships, such thoughts are called interpersonal cognitive distortions (DiGiuseppe & Zee, 1986). Individuals with avoidant attachment tend to be uncomfortable with intimacy and dependency. They have pessimistic beliefs about others and relationships. They tend to ignore the importance of intimacy and interdependence in intimate relationships and instead assert their independence and self-confidence (Locke, 2008). In contrast, individuals with anxious attachment worry about rejection and abandonment, along with a negative self-image and excessive need for approval from others. At the same time, the thoughts, feelings, and actions of anxiously attached individuals tend to focus on their partners (Berry et al., 2006; Collins, 1996; Hazan & Shaver, 1987). Because of these conflicting perceptions, anxious individuals question their values, worry about losing their partner, and display behaviors such as being alert to signs that their partner may be moving away from them (Cassidy & Berlin, 1994). Based on the above statements, it can be explained that avoidant attachment style does not mediate the relationship between childhood traumas and interpersonal cognitive distortions.

Another reason why anxious attachment mediated the relationship between childhood traumas and interpersonal cognitive distortions, and that other attachment styles were not mediated in the study, may be that items assessing interpersonal cognitive distortions had more consistency with items assessing anxious attachment than items assessing other attachment styles. All these situations may explain that anxious attachment has a mediating role in the relationship between childhood traumas and interpersonal cognitive distortions and that other attachment styles are not mediated. So, the present study's differing results may be due to various reasons. These may be the measurement tool used, the difference in the sample, and the focus of this study on cognitive distortions in interpersonal relationships. The findings of the study indicate that we need to further investigate the relationship between secure attachment and avoidant attachment styles and interpersonal cognitive distortions in individuals with childhood trauma.

## **Limitations and Recommendations**

There are several limitations to the current study. Firstly, findings were collected from university students rather than from a clinical setting. Evaluation of childhood trauma is important in clinical practice for determining risk of suicide and planning the treatment. According to Kongerslev et al. (2019), such recognition can be helpful for individuals when planning treatment, including assessment of prognosis, treatment needs, and suicide risk. Secondly, the current study is cross-sectional. Future research can examine the relationship between childhood trauma and interpersonal cognitive distortions mediated by attachment styles that may change over time. In addition, attachment may be the starting point in future studies, followed by childhood traumas and cognitive distortions. Young adults were included in the study. Research can also be conducted with individuals in middle age to examine the mediating effect of adult attachment style. As another limitation, a self-report questionnaire was used to assess adult attachment styles in the current study. It will be an important contribution to expand the current study, which is quantitative research, by developing mixed methods in order to determine the depth and breadth of the subject in future studies. Thus, the opportunity to refer to the narratives of individuals will be provided. Since attachment styles in adulthood are open to change, talking about the unresolved trauma of the individual can ensure their transition to a secure attachment style by developing strategies to cope with close relationships in the future.

## **Conclusion**

Understanding the relationship between childhood trauma and interpersonal cognitive distortion and examining the role of attachment in this relationship is considered important in determining risk factors. The findings of this study show that anxious attachment had a meaningful mediating role in the relationship between childhood trauma and interpersonal cognitive distortion.

## **Declarations and Ethics Statements**

### **Compliance with Ethical Standards**

The authors have no potential conflicts of interest to disclose. This study was conducted in accordance with the 1975 Helsinki Declaration. Firstly, ethics committee permission was obtained from Ataturk University Institute of Social Sciences.

### **Scientific Ethics Declaration**

The authors declare that the scientific ethical and legal responsibility of this article published in JESEH journal belongs to the authors.

### **Availability of data and material (data transparency):**

The data that support the findings of this study are openly available in [open science framework] at <http://doi.org/10.17605/OSF.IO/E5U67>.

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