

Original Research

The Mediating Role of Emotion Regulation Difficulties in the Relationship Between Childhood Trauma and Misophonia: A Cross-Sectional Study of University Students

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Abstract

Background: Misophonia is a sound intolerance characterized by intense emotional and physiological responses to specific repetitive sounds, often impairing functioning. Childhood trauma (CT) may elevate the risk of misophonia through its impact on emotion regulation difficulties (ERDs). **Methods:** We conducted a cross-sectional study of university students ($N = 294$; mean age = 23.4 ± 5.0 ; 71.4% female). Participants completed the Childhood Trauma Questionnaire (CTQ), the Difficulties in Emotion Regulation Scale (DERS), and a misophonia Scale. Pearson correlations were calculated, and mediation analysis was performed to test DERS as a mediator between CTQ scores and misophonia. **Results:** CTQ, DERS, and misophonia were all positively correlated. CTQ showed a significant total effect on misophonia ($b = 0.31$, 95% confidence interval [CI]: 0.15, 0.46). When DERS was included in the model, the direct effect of CTQ on misophonia was not significant ($b = 0.08$, 95% CI: -0.06 , 0.23), while the indirect effect via DERS was significant ($b = 0.22$, 95% CI: 0.13, 0.34). **Conclusions:** Findings are consistent with a full mediation model, with DERS statistically accounting for the association between CTQ and misophonia. Trauma-related impairments in emotion regulation may represent key factors contributing to misophonia. Longitudinal studies are needed to establish temporal and causal pathways.

Keywords: emotion regulation difficulties; sensory processing; trauma; auditory sensitivity; sound intolerance

1. Introduction

Misophonia is a sound intolerance disorder characterized by intense discomfort and increased multifaceted (physiological, cognitive, behavioral) emotional responses to specific repetitive sounds made by others (e.g., chewing, nose-blowing, throat-clearing sounds) (Jager et al., 2020). These reactions can range from emotions such as anger, anxiety, disgust, and panic to physiological reactions such as increased heart rate, sweating, and chest tightness (Erfanian et al., 2019). Individuals' responses to sounds may vary depending on social situations, environmental, and relational factors. For example, a person may be less sensitive to the sounds of others chewing in a relaxed environment, but may react more intensely to these sounds in a stressful environment (Rosenthal et al., 2022). The chronic psychological distress caused by misophonia can seriously affect an individual's social, academic, and professional life, and thus lead to functional impairment (Rouw and Erfanian, 2018).

Misophonia typically begins in childhood or early adolescence, during a critical and sensitive period of brain

development (Brout et al., 2018). This suggests that developmental factors may play an important role in the etiology of the disorder. Current research strongly suggests that the underlying neurobiological mechanism of misophonia is not a primary auditory disorder but rather a disruption in sensory-emotional integration processes (Erfanian et al., 2019). In misophonia, this system mistakenly labels harmless sounds as threats, triggering an exaggerated alarm response (Neacsiu et al., 2022; Sherin and Nemeroff, 2011). In this context, childhood trauma has the potential to permanently reshape the brain's stress response systems, emotional regulation circuits, and sensory processing mechanisms, emerging as a significant risk factor in the development of misophonia (MacMillan et al., 2009).

Childhood trauma has a lasting and harmful effect on an individual's ability to manage emotions in a healthy way (Bilc et al., 2018). Trauma hyperactivates threat detection and salience networks such as the amygdala and insula, while impairing the development of "top-down" regulatory centers such as the prefrontal cortex. These neurobiological changes manifest psychologically as emotion regulation



difficulties, characterized by reduced capacity to tolerate, understand, and manage intense emotions. Numerous studies and meta-analyses have demonstrated a significant and positive association between childhood trauma (CT) and emotion regulation difficulties (ERD) in later life (Fan and Kang, 2025; Usta, 2018).

A comprehensive review focusing on the effects of early life stress and traumatic experiences on individuals' neurobiology, behavior, and health highlights the role of mediating and regulatory mechanisms in the long-term effects of these adverse experiences (Bush et al., 2026). Although a core feature of misophonia is emotional reactions such as intense anger and anxiety to trigger sounds, the extent to which individual differences in experiencing and regulating emotions contribute to misophonia symptoms has not been clearly established (Guetta et al., 2022). Recent network model studies have supported the critical role of emotional functioning, showing significant associations between misophonia and emotion regulation difficulties, affective instability, anger, and anxiety (Hanna et al., 2025). Furthermore, emotion dysregulation findings have been supported in a nationally representative sample, highlighting its robust association with misophonia symptoms (Dixon et al., 2024). Other studies have linked specific affective components, such as disgust and mental contamination, to the disorder, further solidifying the importance of emotion regulation in the misophonia framework (Barahmand et al., 2023).

In this study, we aimed to examine whether difficulties in emotion regulation mediate the relationship between childhood trauma and misophonia symptoms. Childhood traumatic experiences are known to have long-term effects on emotional processing and self-regulation capacities. Therefore, individuals who experienced early adversity may be more prone to dysregulated emotional responses when exposed to specific trigger sounds. By testing this mediation model, the present study sought to clarify one possible pathway linking early adverse experiences to the emotional reactivity that characterizes misophonia.

2. Materials and Methods

2.1 Study Procedure

This study utilized a cross-sectional design and was conducted among university students. Participants were recruited through institutional e-mail invitations distributed to approximately 2600 students. Informed consent was obtained electronically before participation. Data collection took place between April and August 2025 using an online survey platform. A total of 294 students completed the survey, resulting in a response rate of about 11.3%. No data from this sample have been used or published in any prior studies. Ethical committee approval was obtained from Sakarya University on April 12, 2025, no: 2025/204. According to the power analysis conducted based on Siepsiak's 2020 study (Siepsiak et al., 2020). Power for the in-

direct effect was planned using a bias-corrected bootstrap mediation framework rather than a mean-difference effect size. A Monte Carlo power analysis for indirect effects was conducted in R using the RMediation package (Tofighi and MacKinnon, 2011). The simulation employed plausible path coefficients for a (Childhood Trauma Questionnaire [CTQ] → Difficulties in Emotion Regulation Scale [DERS] subscales) and b (DERS subscales → Misophonia dimensions) based on prior small-to-medium effect sizes reported in the literature (Siepsiak et al., 2020). With $\alpha = 0.05$, power = 0.80, and 5000 bootstrap iterations, the required sample size was approximately $N = 160$. The final sample ($N = 294$) exceeded this threshold, ensuring sufficient power to detect the indirect effects.

2.2 Data Collection Tools

2.2.1 Sociodemographic and Clinical Data Form

This form, prepared by the researchers, was used to collect sociodemographic and clinical data such as age, gender, marital status, and history of previous psychiatric disorders from the participants.

2.2.2 Childhood Trauma Questionnaire (CTQ)

The Childhood Trauma Questionnaire is a 28-item self-report measure assessing emotional, physical, and sexual abuse as well as emotional and physical neglect during childhood (Bernstein et al., 1998). The Turkish adaptation demonstrated high internal consistency ($\alpha = 0.79$ – 0.94) and good test-retest reliability (Sar et al., 2012). Items are rated on a 5-point Likert scale (1 = Never true to 5 = Very often true); higher scores indicate greater childhood trauma exposure. A sample item is "When I was growing up, someone in my family hit me so hard that it left me with bruises or marks".

2.2.3 Difficulties in Emotion Regulation Scale (DERS)

The Difficulties in Emotion Regulation Scale is a 6-factor, 36-item scale that assesses individuals' typical problems in understanding, accepting, and managing their emotions (Gratz and Roemer, 2004). The Turkish version confirmed the six-factor structure with excellent reliability ($\alpha = 0.80$ – 0.94). Responses are rated on a 5-point Likert scale (1 = Almost never to 5 = Almost always), with higher scores reflecting greater emotion-regulation difficulties. A sample item is "When I'm upset, I have difficulty controlling my behaviors". Subscales are awareness, nonacceptance, clarity, strategies, impulses, and goals. The Turkish validity and reliability of the scale were examined by Ruganci and Gençöz (2010).

2.2.4 Misophonia Scale

The misophonia Scale assesses aversive emotional and behavioral reactions to specific trigger sounds such as chewing, breathing, or tapping (Wu et al., 2014). The scale consists of 17 items. The Turkish version developed by

Table 1. Sociodemographic and clinical data.

		Mean $\pm$ SD (%)	n
Age		23.4 $\pm$ 5.0	294
Gender	Male	28.6	84
	Female	71.4	210
Place of birth	Metropolitan Center	56.5	166
	District Center	33.7	99
	Town/Village	9.9	29
Family's financial situation	Low	9.5	28
	Medium	81.6	240
	High	8.8	26
Chronic disease		10.9	32
Smoking		33.0	97
Alcohol		19.7	58
Substance		1.0	3
History of psychiatric illness		12.9	38
Family history of psychiatric illness		15.6	46

Note: SD, Standard Deviation.

Deniz Sakarya and Çakmak (2022) showed high internal consistency ($\alpha \approx 0.90$) and satisfactory construct validity. Items are scored on a 5-point Likert scale (1 = Strongly disagree to 5 = Strongly agree); higher total scores denote more severe misophonia symptoms. A sample item is “Certain everyday sounds cause me to feel angry or anxious”.

2.3 Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY, USA) and R version 4.3.3. (R Foundation for Statistical Computing, Vienna, Austria) Descriptive statistics (means, standard deviations, frequencies, and percentages) were calculated for sociodemographic and clinical variables. Normality assumptions were evaluated using Kolmogorov–Smirnov tests, skewness-kurtosis values, and visual inspection of histograms. Pearson correlation analyses were conducted to examine bivariate associations between childhood trauma (CTQ total and subscale scores), emotion regulation difficulties (DERS total and subscales), and misophonia (total and subscale scores). To test the hypothesized mediating role of emotion regulation difficulties between childhood trauma and misophonia, a series of mediation models were estimated using the PROCESS macro v4.3 (Hayes, 2017) and cross-checked via a Monte Carlo simulation approach in R (Tofighi and MacKinnon, 2011). Each DERS subscale was examined as a potential mediator between specific CTQ subtypes (emotional, physical, sexual abuse; emotional, physical neglect) and misophonia outcomes (emotion, behavior, total). Indirect effects were evaluated with 5000 bias-corrected bootstrap samples, with 95% confidence intervals. Multiple mediation models were compared to identify the most influential emotion regula-

tion components. Bonferroni correction was applied to control type I error across multiple comparisons (adjusted $\alpha = 0.01$). Finally, a full-model path analysis was performed in IBM SPSS AMOS (Version 29.0; IBM Corp., Armonk, NY, USA). to visualize the structural relationships among CTQ subtypes, DERS dimensions, and misophonia domains.

Model fit was evaluated using multiple fit indices: χ^2/df , Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Acceptable thresholds were defined as $\chi^2/\text{df} < 3$, CFI and TLI ≥ 0.90 , RMSEA ≤ 0.08 , and SRMR ≤ 0.08 (Hu and Bentler, 1999).

3. Results

The data of 294 participants were analyzed in our study. The mean age of the participants was found to be 23.4 ± 5.0 . 28.6% of the participants were male ($n = 84$), and 71.4% were female ($n = 210$). When examining the participants' place of birth, 56.5% reported growing up in a metropolitan area ($n = 166$), 33.7% in a district center ($n = 99$), and 9.9% in a village/rural area ($n = 29$). 81.6% of participants reported their financial status as middle ($n = 240$), 9.5% as low ($n = 28$), and 8.8% as high ($n = 26$). The rate of participants with chronic diseases is 10.9% ($n = 32$), the rate of smokers is 33.0% ($n = 97$), the rate of alcohol users is 19.7% ($n = 58$), and the rate of substance users is 1.0% ($n = 3$). The proportion of participants with a history of psychiatric illness is 12.9% ($n = 38$), and the proportion of those with a family history of psychiatric illness is 15.6% ($n = 46$). Table 1 presents the sociodemographic characteristics of the participants.

Table 2. Correlations between misophonia, DERS, and CTQ scales.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Misophonia emotion	1															
Misophonia behavior	0.680	1														
Misophonia total	0.924	0.909	1													
Emotional neglect	0.025	-0.107	-0.042	1												
Physical neglect	0.066	0.205	0.145	-0.232	1											
Emotional abuse	0.135	0.327	0.247	-0.415	0.572	1										
Physical abuse	0.074	0.244	0.169	-0.244	0.581	0.632	1									
Sexual abuse	0.069	0.183	0.135	-0.174	0.556	0.519	0.544	1								
CTQ total	0.125	0.293	0.224	-0.085	0.760	0.809	0.829	0.776	1							
Nonacceptance	0.287	0.439	0.392	-0.194	0.299	0.428	0.285	0.237	0.362	1						
Goals	0.315	0.403	0.390	0.042	0.075	0.280	0.139	0.056	0.213	0.579	1					
Impulse	0.366	0.460	0.448	-0.145	0.255	0.413	0.355	0.186	0.369	0.745	0.620	1				
Awareness	0.102	0.080	0.100	0.377	-0.115	-0.113	-0.038	-0.036	0.008	-0.071	0.154	-0.005	1			
Strategies	0.341	0.447	0.427	-0.068	0.260	0.409	0.272	0.228	0.374	0.778	0.721	0.788	0.140	1		
Clarity	0.228	0.266	0.268	0.012	0.133	0.278	0.204	0.101	0.251	0.453	0.411	0.507	0.327	0.516	1	
DERS total	0.376	0.485	0.467	-0.009	0.219	0.394	0.283	0.187	0.366	0.821	0.794	0.847	0.323	0.917	0.680	1

Note: n = 294; CTQ, Childhood Trauma Questionnaire; DERS, Difficulties in Emotion Regulation Scale.

When correlation analyses were examined, positive and significant relationships were found between the Childhood Trauma Questionnaire total score and misophonia emotion ($r = 0.125$, $p = 0.032$), misophonia behavior ($r = 0.293$, $p < 0.001$), and misophonia total ($r = 0.224$, $p < 0.001$). Strong, positive, and significant correlations were observed between the total score of the DERS and misophonia emotion ($r = 0.376$, $p < 0.001$), misophonia behavior ($r = 0.485$, $p < 0.001$), and misophonia total ($r = 0.467$, $p < 0.001$). Table 2 presents the correlation analyses.

The findings from the full mediation path analysis indicated that the effect of childhood trauma on misophonia is largely exerted through the dimensions of DERS. The total indirect effects of Emotional Abuse ($\beta = 0.171$, $p = 0.001$), Physical Abuse ($\beta = 0.138$, $p = 0.001$), Physical Neglect ($\beta = 0.107$, $p = 0.001$), and Sexual Abuse ($\beta = 0.087$, $p = 0.002$) on MS-Behavior were all found to be statistically significant. Similarly, the total indirect effects of these trauma types on MS-Emotion and MS-Total were also significant.

When examining the specific indirect effects, the Impulse subscale emerged as the most consistent and potent mediator in the relationship between all significant trauma types and all three subscales of MS. For instance, the effect of Emotional Abuse on MS-Total ($\beta = 0.11$, $p = 0.002$), Physical Neglect on MS-Total ($\beta = 0.069$, $p = 0.002$), and Sexual Abuse on MS-Total ($\beta = 0.051$, $p = 0.002$) were strongly predicted via this mediator. Furthermore, the Goals subscale also showed a significant mediating role in the effects of Emotional Abuse and Physical Abuse on MS-Behavior. Although the total indirect effect of Emotional Neglect on misophonia was statistically non-significant, the Impulse subscale was still found to be a significant specific mediator in the relationship between Emotional Neglect and MS-Emotion ($\beta = -0.039$, $p = 0.012$) and MS-Total ($\beta = -$

0.039 , $p = 0.015$). Collectively, the findings support that emotional impulse control is a key mechanism linking a history of childhood trauma to misophonia (Table 3).

The full structural equation model (SEM) model demonstrated an acceptable fit to the data: $\chi^2/df = 2.41$, CFI = 0.93, TLI = 0.91, RMSEA = 0.069 [90% CI: 0.059–0.078], SRMR = 0.054. All standardized path coefficients are shown in Fig. 1.

Fig. 1 shows among the emotion regulation components, impulse control difficulties emerged as the strongest and most consistent mediator linking childhood trauma to misophonia outcomes. Specifically, emotional abuse ($\beta = 0.413$, $p < 0.001$), physical abuse ($\beta = 0.355$, $p < 0.001$), physical neglect ($\beta = 0.255$, $p < 0.001$), and sexual abuse ($\beta = 0.186$, $p = 0.001$) significantly predicted impulse difficulties, which in turn were positively associated with misophonia total ($\beta = 0.267$, $p = 0.004$), behavioral ($\beta = 0.228$, $p = 0.017$), and emotional ($\beta = 0.269$, $p = 0.006$) dimensions. Emotional neglect negatively predicted impulse control ($\beta = -0.145$, $p = 0.013$). Additional indirect effects were observed between emotional abuse and misophonia via the goals subscale ($\beta = 0.038$, $p = 0.048$), and between physical abuse and misophonia via the nonacceptance subscale ($\beta = 0.052$, $p = 0.048$). Overall, the model explained a substantial proportion of variance in misophonia outcomes, indicating that early traumatic experiences contribute to increased misophonic reactivity primarily through deficits in impulse control and related emotional regulation processes.

4. Discussion

This study is the first to examine the mediating role of ERD in the effect of CT on misophonia symptoms. Correlation analyses revealed positive and statistically significant relationships between the CTQ total score and the MS total

Table 3. Full mediation path analysis of CTQ, DERS subscales, and misophonia dimensions.

PV	MV	DV	Direct effect of PV on MV		Direct effect of MV on DV		Total indirect effect		Specific indirect effect	
			β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Emotional abuse	Awareness	MS-Behavior	-0.113	0.053	0.106	0.071	0.171	0.001	-0.012	0.108
Emotional abuse	Clarity	MS-Behavior	0.278	0.001	-0.052	0.422	0.171	0.001	-0.015	0.455
Emotional abuse	Goals	MS-Behavior	0.280	0.001	0.136	0.067	0.171	0.001	0.038	0.048
Emotional abuse	Impulse	MS-Behavior	0.413	0.001	0.217	0.017	0.171	0.001	0.090	0.032
Emotional abuse	Nonacceptance	MS-Behavior	0.428	0.001	0.164	0.067	0.171	0.001	0.070	0.082
Emotional abuse	Strategies	MS-Behavior	0.409	0.001	-0.002	0.988	0.171	0.001	-0.001	0.995
Emotional abuse	Awareness	MS-Emotion	-0.113	0.053	0.077	0.223	0.152	0.001	-0.009	0.278
Emotional abuse	Clarity	MS-Emotion	0.278	0.001	0.004	0.956	0.152	0.001	0.001	0.920
Emotional abuse	Goals	MS-Emotion	0.280	0.001	0.106	0.185	0.152	0.001	0.030	0.185
Emotional abuse	Impulse	MS-Emotion	0.413	0.001	0.269	0.006	0.152	0.001	0.111	0.002
Emotional abuse	Nonacceptance	MS-Emotion	0.428	0.001	-0.002	0.982	0.152	0.001	-0.001	0.990
Emotional abuse	Strategies	MS-Emotion	0.409	0.001	0.049	0.670	0.152	0.001	0.020	0.608
Emotional abuse	Awareness	MS-Total	-0.113	0.053	0.099	0.099	0.176	0.001	-0.011	0.140
Emotional abuse	Clarity	MS-Total	0.278	0.001	-0.025	0.708	0.176	0.001	-0.007	0.740
Emotional abuse	Goals	MS-Total	0.280	0.001	0.131	0.084	0.176	0.001	0.037	0.060
Emotional abuse	Impulse	MS-Total	0.413	0.001	0.267	0.004	0.176	0.001	0.110	0.002
Emotional abuse	Nonacceptance	MS-Total	0.428	0.001	0.084	0.358	0.176	0.001	0.036	0.368
Emotional abuse	Strategies	MS-Total	0.409	0.001	0.027	0.804	0.176	0.001	0.011	0.780
Emotional neglect	Awareness	MS-Behavior	0.377	0.001	0.112	0.072	-0.021	0.602	0.042	0.105
Emotional neglect	Clarity	MS-Behavior	0.012	0.831	-0.036	0.576	-0.021	0.602	0.000	0.960
Emotional neglect	Goals	MS-Behavior	0.042	0.477	0.144	0.056	-0.021	0.602	0.006	0.550
Emotional neglect	Impulse	MS-Behavior	-0.145	0.013	0.227	0.013	-0.021	0.602	-0.033	0.038
Emotional neglect	Nonacceptance	MS-Behavior	-0.194	0.001	0.174	0.055	-0.021	0.602	-0.034	0.065
Emotional neglect	Strategies	MS-Behavior	-0.068	0.243	0.026	0.806	-0.021	0.602	-0.002	0.838
Emotional neglect	Awareness	MS-Emotion	0.377	0.001	0.066	0.315	-0.014	0.725	0.025	0.340
Emotional neglect	Clarity	MS-Emotion	0.012	0.831	0.003	0.962	-0.014	0.725	0.000	0.965
Emotional neglect	Goals	MS-Emotion	0.042	0.477	0.100	0.214	-0.014	0.725	0.004	0.635
Emotional neglect	Impulse	MS-Emotion	-0.145	0.013	0.271	0.006	-0.014	0.725	-0.039	0.012
Emotional neglect	Nonacceptance	MS-Emotion	-0.194	0.001	0.002	0.987	-0.014	0.725	-0.001	0.965
Emotional neglect	Strategies	MS-Emotion	-0.068	0.243	0.046	0.685	-0.014	0.725	-0.003	0.690
Emotional neglect	Awareness	MS-Total	0.377	0.001	0.096	0.128	-0.018	0.638	0.036	0.158
Emotional neglect	Clarity	MS-Total	0.012	0.831	-0.017	0.797	-0.018	0.638	-0.001	0.980
Emotional neglect	Goals	MS-Total	0.042	0.477	0.132	0.085	-0.018	0.638	0.005	0.570
Emotional neglect	Impulse	MS-Total	-0.145	0.013	0.273	0.004	-0.018	0.638	-0.039	0.015
Emotional neglect	Nonacceptance	MS-Total	-0.194	0.001	0.091	0.321	-0.018	0.638	-0.018	0.340
Emotional neglect	Strategies	MS-Total	-0.068	0.243	0.040	0.713	-0.018	0.638	-0.003	0.750
Physical abuse	Awareness	MS-Behavior	-0.038	0.515	0.084	0.150	0.138	0.001	-0.003	0.562
Physical abuse	Clarity	MS-Behavior	0.204	0.001	-0.038	0.555	0.138	0.001	-0.008	0.595
Physical abuse	Goals	MS-Behavior	0.139	0.017	0.147	0.051	0.138	0.001	0.020	0.028
Physical abuse	Impulse	MS-Behavior	0.355	0.001	0.197	0.035	0.138	0.001	0.070	0.058
Physical abuse	Nonacceptance	MS-Behavior	0.285	0.001	0.182	0.043	0.138	0.001	0.052	0.048
Physical abuse	Strategies	MS-Behavior	0.272	0.001	0.023	0.827	0.138	0.001	0.006	0.818
Physical abuse	Awareness	MS-Emotion	-0.038	0.515	0.078	0.209	0.125	0.001	-0.003	0.580
Physical abuse	Clarity	MS-Emotion	0.204	0.001	0.004	0.949	0.125	0.001	0.001	0.910
Physical abuse	Goals	MS-Emotion	0.139	0.017	0.098	0.221	0.125	0.001	0.014	0.218
Physical abuse	Impulse	MS-Emotion	0.355	0.001	0.285	0.004	0.125	0.001	0.101	0.001
Physical abuse	Nonacceptance	MS-Emotion	0.285	0.001	-0.002	0.983	0.125	0.001	-0.001	0.998
Physical abuse	Strategies	MS-Emotion	0.272	0.001	0.048	0.675	0.125	0.001	0.013	0.620
Physical abuse	Awareness	MS-Total	-0.038	0.515	0.088	0.137	0.143	0.001	-0.003	0.558
Physical abuse	Clarity	MS-Total	0.204	0.001	-0.017	0.792	0.143	0.001	-0.004	0.812

Table 3. Continued.

PV	MV	DV	Direct effect of PV on MV		Direct effect of MV on DV		Total indirect effect		Specific indirect effect	
			β	<i>p</i>	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Physical abuse	Goals	MS-Total	0.139	0.017	0.132	0.084	0.143	0.001	0.018	0.050
Physical abuse	Impulse	MS-Total	0.355	0.001	0.265	0.006	0.143	0.001	0.094	0.008
Physical abuse	Nonacceptance	MS-Total	0.285	0.001	0.094	0.306	0.143	0.001	0.027	0.318
Physical abuse	Strategies	MS-Total	0.272	0.001	0.040	0.718	0.143	0.001	0.011	0.702
Physical neglect	Awareness	MS-Behavior	-0.115	0.049	0.091	0.120	0.107	0.001	-0.010	0.148
Physical neglect	Clarity	MS-Behavior	0.133	0.022	-0.035	0.587	0.107	0.001	-0.005	0.632
Physical neglect	Goals	MS-Behavior	0.075	0.200	0.153	0.044	0.107	0.001	0.011	0.072
Physical neglect	Impulse	MS-Behavior	0.255	0.001	0.228	0.013	0.107	0.001	0.058	0.025
Physical neglect	Nonacceptance	MS-Behavior	0.299	0.001	0.170	0.060	0.107	0.001	0.051	0.070
Physical neglect	Strategies	MS-Behavior	0.260	0.001	0.004	0.967	0.107	0.001	0.001	0.952
Physical neglect	Awareness	MS-Emotion	-0.115	0.049	0.079	0.210	0.079	0.018	-0.009	0.262
Physical neglect	Clarity	MS-Emotion	0.133	0.022	0.002	0.977	0.079	0.018	0.001	0.940
Physical neglect	Goals	MS-Emotion	0.075	0.200	0.103	0.202	0.079	0.018	0.008	0.228
Physical neglect	Impulse	MS-Emotion	0.255	0.001	0.268	0.006	0.079	0.018	0.069	0.001
Physical neglect	Nonacceptance	MS-Emotion	0.299	0.001	-0.003	0.979	0.079	0.018	-0.001	0.995
Physical neglect	Strategies	MS-Emotion	0.260	0.001	0.049	0.672	0.079	0.018	0.013	0.630
Physical neglect	Awareness	MS-Total	-0.115	0.049	0.092	0.122	0.101	0.002	-0.011	0.165
Physical neglect	Clarity	MS-Total	0.133	0.022	-0.017	0.794	0.101	0.002	-0.002	0.822
Physical neglect	Goals	MS-Total	0.075	0.200	0.138	0.073	0.101	0.002	0.010	0.095
Physical neglect	Impulse	MS-Total	0.255	0.001	0.272	0.004	0.101	0.002	0.069	0.002
Physical neglect	Nonacceptance	MS-Total	0.299	0.001	0.087	0.343	0.101	0.002	0.026	0.345
Physical neglect	Strategies	MS-Total	0.260	0.001	0.030	0.784	0.101	0.002	0.008	0.755
Sexual abuse	Awareness	MS-Behavior	-0.036	0.538	0.083	0.154	0.087	0.002	-0.003	0.460
Sexual abuse	Clarity	MS-Behavior	0.101	0.085	-0.032	0.627	0.087	0.002	-0.003	0.698
Sexual abuse	Goals	MS-Behavior	0.056	0.342	0.151	0.045	0.087	0.002	0.008	0.308
Sexual abuse	Impulse	MS-Behavior	0.186	0.001	0.236	0.010	0.087	0.002	0.044	0.020
Sexual abuse	Nonacceptance	MS-Behavior	0.237	0.001	0.173	0.055	0.087	0.002	0.041	0.075
Sexual abuse	Strategies	MS-Behavior	0.228	0.001	0.001	0.998	0.087	0.002	0.000	0.985
Sexual abuse	Awareness	MS-Emotion	-0.036	0.538	0.080	0.199	0.062	0.022	-0.003	0.535
Sexual abuse	Clarity	MS-Emotion	0.101	0.085	0.002	0.980	0.062	0.022	0.001	0.940
Sexual abuse	Goals	MS-Emotion	0.056	0.342	0.108	0.181	0.062	0.022	0.006	0.400
Sexual abuse	Impulse	MS-Emotion	0.186	0.001	0.268	0.006	0.062	0.022	0.050	0.001
Sexual abuse	Nonacceptance	MS-Emotion	0.237	0.001	-0.006	0.950	0.062	0.022	-0.001	0.972
Sexual abuse	Strategies	MS-Emotion	0.228	0.001	0.044	0.706	0.062	0.022	0.010	0.662
Sexual abuse	Awareness	MS-Total	-0.036	0.538	0.089	0.134	0.080	0.005	-0.003	0.450
Sexual abuse	Clarity	MS-Total	0.101	0.085	-0.016	0.815	0.080	0.005	-0.002	0.868
Sexual abuse	Goals	MS-Total	0.056	0.342	0.140	0.068	0.080	0.005	0.008	0.320
Sexual abuse	Impulse	MS-Total	0.186	0.001	0.275	0.003	0.080	0.005	0.051	0.002
Sexual abuse	Nonacceptance	MS-Total	0.237	0.001	0.087	0.343	0.080	0.005	0.021	0.368
Sexual abuse	Strategies	MS-Total	0.228	0.001	0.025	0.821	0.080	0.005	0.006	0.795

Note: DV, Dependent Variable; PV, Predictor Variable; MV, Mediator Variable; MS, Misophonia.

score, and between the DERS total score and the MS total score. Our most critical finding, consistent with our hypothesis, is that although the total effect of DERS on MS was statistically significant, the direct effect lost significance when DERS was included in the model. This result supports that the relationship between CT and misophonia is fully mediated by ERD. When the subscales of the mediation analyses were examined, it was revealed that this

key relationship was primarily mediated by difficulties in impulse control. The satisfactory model fit indices (CFI = 0.93, TLI = 0.91, RMSEA = 0.069, SRMR = 0.054) confirm that the structural model provides an adequate representation of the data. Interpretation of the full model therefore supports that the hypothesized mediation structure is statistically valid.

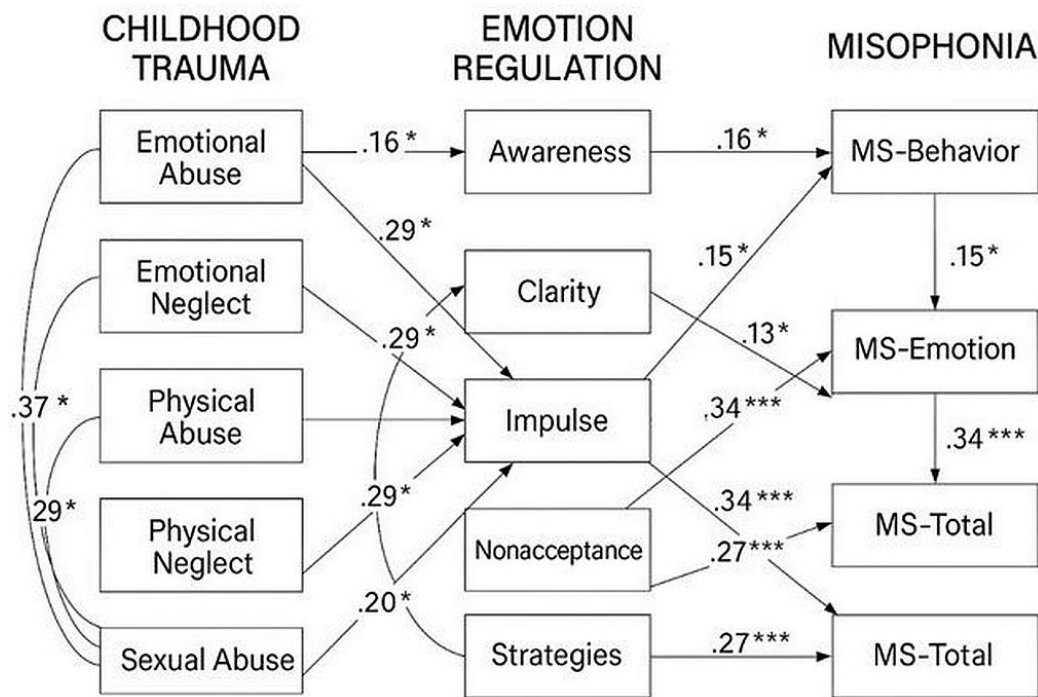


Fig. 1. Structural mediation model illustrating significant paths between childhood trauma, DERS subscales, and misophonia outcomes. * $p < 0.050$, *** $p < 0.001$.

A review of the literature reveals that misophonia frequently co-occurs with psychiatric disorders. A study conducted in 2020 included 575 participants diagnosed with misophonia and found that 28.2% of participants had at least one Axis I diagnosis and 41.4% had at least one Axis II diagnosis (Jager et al., 2020). In a study by Erfanian et al. (2019), the most common psychiatric comorbidity in misophonia patients was found to be Post-Traumatic Stress Disorder (PTSD) (15.38%), followed by Obsessive-Compulsive Disorder (OCD) (11.53%), Depressive Disorder (9.61%), and Anorexia Nervosa (9.61%). In a study by Rosenthal, the most common mental disorders in 202 participants with misophonia were anxiety disorders. After controlling for age and gender, it was shown that the severity of misophonia was significantly predicted by borderline personality disorder, obsessive-compulsive disorder, and panic disorder (Rosenthal et al., 2022). A more intriguing finding from a large-scale study involving 301 participants diagnosed with misophonia was that the only psychiatric disorder associated with misophonia was PTSD (Rouw and Erfanian, 2018). These results suggest that there may be common etiological factors or underlying mechanisms beyond a superficial association between trauma and misophonia.

When examining studies on the etiology of misophonia, a history of trauma emerges as an important factor, as discussed above. Although no study has directly addressed the relationship between childhood trauma and misophonia, neurobiological changes such as anterior cingulate cortex hyperactivation and abnormal functional connectivity in

emotion processing and regulation centers (amygdala, hippocampus, ventromedial prefrontal cortex) that play a role in the etiology of misophonia are very similar to changes resulting from trauma (Brout et al., 2018; Neacsu et al., 2022; Sherin and Nemeroff, 2011). When examining studies investigating neurobiological variables in childhood trauma, a wide inconsistency is observed in the results related to the Hypothalamic-Pituitary-Adrenal (HPA) axis. Some studies report hyperactivation of the HPA axis in response to stress (Ivanov et al., 2011), while others report hypoactivation (MacMillan et al., 2009). Despite these conflicting results, there is a robust literature linking HPA system dysregulation resulting from early adverse experiences to difficulties in emotion regulation and stress intolerance (Thomas et al., 2019; Usta, 2018). The excessive physiological and emotional responses to specific triggers observed in both misophonia and traumatic early life events suggest that a mechanism similar to HPA system dysfunction, which is well documented in relation to traumatic experiences, may also play a role in misophonia (Ferrer-Torres and Giménez-Llort, 2022).

The total effect of CT on misophonia is statistically significant ($b = 0.31$), confirming that traumatic experiences are generally associated with the severity of misophonia symptoms. However, when ERD is included in the model, the direct effect of CT on misophonia loses its statistical significance ($b = 0.08$, 95% CI $[-0.06, 0.23]$). This result suggests that the association between CT and misophonia is largely accounted for by the individual's reported difficulties in emotion regulation. The functional connection

between the amygdala and the ventromedial prefrontal cortex (vmPFC), which is responsible for regulating and controlling amygdala activity, was found to be weaker in individuals with misophonia (Neacsiu et al., 2022; Schröder et al., 2017). This finding reflects a classic model of emotion regulation difficulty. When the amygdala is activated by a trigger sound, it continues to fire at full capacity, while the “top-down” control or “braking system” represented by the vmPFC fails to engage. Even if the individual cognitively knows that they should “calm down”, the brain’s relevant neural circuitry is unable to effectively implement this command. This may provide a neurobiological explanation for why individuals with misophonia feel they have little control over their responses (Jastreboff and Jastreboff, 2023). Our path analysis results further developed this finding, revealing that among the DERS subscales, impulse control difficulties emerged as a specific mediator linking childhood trauma to misophonia symptoms.

It is important to note that some findings suggest a nuanced relationship; for instance, Guetta et al. (2024) report that misophonia is related to general stress but not directly to traumatic stress. Our finding that the CT-misophonia relationship operates entirely via ERD is consistent with this perspective, suggesting that the critical pathway is not a direct trauma response but rather the general emotion dysregulation that results from early adversity. This emphasizes the importance of ERD as a common intermediary mechanism.

Our study is the first to investigate the relationship between CT and misophonia, and our findings provide a strong theoretical basis for the relationship between misophonia and trauma through underlying common neurobiological mechanisms (such as amygdala hyperactivity, ventromedial prefrontal cortex hypoactivity, and HPA axis dysregulation).

The finding of full mediation by ERD in our study has strong theoretical implications. It supports the move toward cognitive models of misophonia, positing that the disorder is driven by the emotional processing impairments that result from early life stress, rather than being solely a primary auditory disorder. Furthermore, these results provide context for the social cognition perspective on misophonia, showing how difficulty in regulating one’s own internal emotional responses likely complicates the appraisal of sounds made by others. From a clinical perspective, the finding that impulse control difficulties are the key link strongly suggests that interventions should prioritize skills training to manage sudden, intense emotional and behavioral reactions. Dialectical Behavior Therapy, with its strong emphasis on distress tolerance and impulse control skills, may therefore be particularly well-suited for targeting the core mechanism underlying the trauma-misophonia association.

Our key result, that the relationship between childhood trauma and misophonia is fully mediated by difficul-

ties in emotion regulation, aligns strongly with the general literature suggesting that emotional factors mediate psychopathology. In this context, studies have examined the indirect effects of emotional competence on mental health. For example, a study by Jaureguizar et al. (2024) found that emotional intelligence reduces emotional symptoms (depression, anxiety, stress, and somatic complaints) through happiness, rather than directly. This finding suggests that emotional control skills reduce psychological distress through internal positive states, providing a theoretically complementary framework that works inversely (mirroring) to the role of ERD (lack of emotional control) in mediating negative outcomes (misophonia) in our study. Furthermore, the finding of Impulse Control Difficulties as the strongest mediator in our study is consistent with the mechanisms underlying aggressive and destructive behavior. Jaureguizar et al. (2024) demonstrated that low self-esteem and high hostility mediated the relationship between family social support and dating violence through their sequential mediating roles. Theoretical framework suggesting that unsuccessful emotion regulation strategies lead to aggressive acts reinforces the premise that the intense anger and behavioral reactions triggered by sounds in misophonia (MS-Behavior) reflect trauma-induced impulse control deficits.

Limitations

The cross-sectional design of the study prevents the establishment of causal relationships between variables. Although the findings suggest a relationship and mediation model, it is not possible to definitively state that CT causes ERD, which in turn causes misophonia. Future longitudinal studies may clarify the temporal and causal relationships between these variables. The research was conducted with university students. The average age and sociodemographic characteristics of this group limit the generalizability of the findings to broader and more diverse demographic groups (e.g., different age groups, educational levels, clinical populations). Additionally, our study was conducted with a general sample (university students) without a diagnosis of misophonia, which limits the generalizability of the findings to clinical populations diagnosed with misophonia. This study did not examine whether participants’ misophonia Scale scores exceeded clinical cutoff points. A study conducted with individuals diagnosed with misophonia may yield different results. The fact that the data was collected using self-report scales also constitutes a limitation. Participants may have had difficulty recalling past experiences such as early life events.

5. Conclusions

This study examined the role of emotion regulation difficulties in the effect of childhood trauma on misophonia symptoms in university students. The findings revealed that the relationship between CT and misophonia was con-

sistent with full mediation by emotion regulation difficulties. Childhood trauma are indirectly associated with intensified misophonia symptoms via difficulties in managing emotions. The direct effect of CT on misophonia lost its significance when ERD was included in the model. This strongly suggests that impairments in emotion regulation mechanisms are an important factor associated with misophonia symptoms.

Availability of Data and Materials

De-identified data and analysis code will be deposited in an institutional repository upon publication; additional materials are available from the corresponding author on reasonable request.

Author Contributions

ŞK, EE, FB, and OK conceived and designed the research study. ŞK, EE, FB, OK, MBU, and PG performed the research and participated in the investigation. MBU, PG, OK, and ŞK processed and analyzed the data. MBU, PG, OK, and ŞK drafted and wrote the manuscript. All authors contributed to critical editorial revisions and intellectual content of the manuscript. All authors read and approved the final manuscript. All authors agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki. The research protocol was approved by the Ethics Committee of Sakarya University (Ethic Approval Number: 2025/204), and all of the participants provided signed informed consent.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT-5 in order to check spelling and grammar. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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