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Research Paper

Early maladaptive schemas and misophonia: Incremental contributions beyond personality traits and general psychopathology

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ABSTRACT

Misophonia is a sound sensitivity disorder characterized by heightened emotional, physiological, and behavioral reactions to specific auditory stimuli. Although prior research has linked misophonia to maladaptive personality traits and internalizing symptoms, the role of early maladaptive schemas (EMSs) remains underexplored. The present study examined the associations between misophonia severity, EMSs, personality trait domains, and psychological symptoms, and tested whether EMSs accounted for incremental variance beyond these factors. A total of 144 adults (72 with misophonia and 72 matched controls) completed self-report measures of misophonia, EMSs, personality traits, depression, and anxiety. Misophonia severity was positively associated with most EMSs, as well as with negative affectivity, detachment, psychoticism, and symptoms of depression and anxiety. Individuals with misophonia reported significantly higher levels across all EMSs, personality domains, and psychological symptoms compared to controls. Regression analyses indicated that several EMSs predicted misophonia severity, with Entitlement and Emotional Inhibition emerging as the strongest independent predictors. In a hierarchical regression model, EMSs accounted for additional variance beyond personality traits and psychological symptoms. In the final model, Entitlement and Negative Affectivity remained significant predictors. These findings support a hierarchical framework in which personality trait domains reflect a broad dispositional vulnerability, whereas EMSs represent more specific cognitive-emotional processes that may shape the appraisal and perceived meaning of trigger sounds. Targeting EMSs may enhance psychological interventions by addressing maladaptive appraisals and emotional regulation difficulties underlying misophonic responses.

1. Introduction

Misophonia is a condition characterized by a reduced tolerance for specific auditory stimuli, commonly referred to as "trigger" sounds. The term was originally introduced by Jastreboff and Jastreboff (2001) and has since been further conceptualized in a more recent consensus definition (Swedo et al., 2022). Individuals with misophonia typically experience intense emotional and physiological reactions when exposed to particular sounds, often repetitive human-generated oral or nasal noises (e.g., chewing, sniffing, or throat clearing). However, triggering stimuli may also include animal-produced or environmental sounds (e.g., pen clicking or clock ticking). Responses to trigger stimuli involve strong affective reactions (e.g., anger, disgust or anxiety), heightened physiological arousal (e.g., increased heart rate or muscle tension), and behavioral responses such as avoidance, escape, or confrontation toward the individual producing the sound. Importantly, the severity of misophonic reactions appears to be influenced by the subjective meaning attributed to the trigger, the situational context, the perceived controllability of the stimulus, and the relationship with the individual producing the sound (Swedo et al., 2022). Although research on misophonia has grown in recent years, the condition remains relatively underrecognized and is not yet formally classified as a distinct diagnostic

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disorder in major psychiatric nosologies such as the DSM-5 and ICD-11 (American Psychiatric Association, 2013a; World Health Organization, 2019). Nevertheless, increasing evidence suggests that misophonia can lead to significant distress and functional impairment (Brout et al., 2018).

As outlined in a recent systematic review (Rodrigues and Aazh, 2025), misophonia has been associated with various psychopathological disorders, such as mood disorders, anxiety disorders, obsessive-compulsive disorder (OCD), eating disorders, neurodevelopmental disorders and personality disorders (Cassiello-Robbins et al., 2021; Erfanian et al., 2019; Jager et al., 2020; Rosenthal et al., 2022; Schröder et al., 2013). In line with a growing transdiagnostic perspective, increasing attention has been devoted to identifying stable psychological vulnerabilities underlying misophonia. Although research remains limited, studies have reported significant associations between misophonic symptoms and personality traits such as neuroticism, conscientiousness, threat anticipation, perfectionism, and intolerance of ambiguity (Colak et al., 2021; Daniels et al., 2020; McKay et al., 2018), as reviewed by Koroglu and Durat (2024). However, trait-based approaches may primarily describe general dispositional tendencies and may not fully capture the specific cognitive-affective processes through which individuals interpret and respond to trigger stimuli. In this regard, some authors have suggested that misophonia may involve specific patterns of cognitive appraisal (Natalini et al., 2020, 2024). Trigger sounds are often perceived as intentional, and the individuals producing them are viewed as disrespectful or prevaricating (Gregory and Foster, 2023; Gregory et al., 2024; Natalini et al., 2024; Woolley et al., 2026). At the same time, these externalizing appraisals frequently co-occur with negative self-related cognitions, with individuals reporting feelings of inadequacy, vulnerability, or inferiority (Gregory and Foster, 2023; Natalini et al., 2024; Woolley et al., 2026). Similar attributional patterns are central features of the so-called early maladaptive schemas (EMSs; Young et al., 2003). EMSs are pervasive and dysfunctional cognitive-emotional patterns that originate in childhood when basic psychological needs - such as secure attachment to others, autonomy, competence and identity, freedom to express needs and emotions, spontaneity and play, realistic limits and self-control - are insufficiently met. These schemas shape beliefs about the self, others and the world, thereby influencing emotional responses and interpersonal functioning (Young et al., 2003). The five domains and their corresponding schemas are presented and described in Table 1.

A large body of research has shown that specific EMS profiles are associated with a variety of psychological disorders, including mood disorders (Bishop et al., 2022), anxiety disorders (Tariq et al., 2021), obsessive–compulsive disorder (Dostal and Pilkington, 2023) and personality disorders (Barazandeh et al., 2016; Panagiotopoulos et al., 2023). Given the frequent comorbidity between misophonia and these conditions (Cassiello-Robbins et al., 2021; Erfanian et al., 2019; Jager et al., 2020; Rosenthal et al., 2022; Schröder et al., 2013; Siepsiak et al., 2020), EMSs may represent shared vulnerability factors underlying both misophonic symptoms and broader psychopathological manifestations. However, research directly investigating the association between misophonia and EMSs remains extremely limited, with only one empirical study conducted on non-clinical individuals (Stalias-Mantzikos et al., 2023) and one case series (Natalini et al., 2020). Preliminary findings suggest that specific schemas may be associated with emotional distress and behavioral responses to misophonic triggers. Stalias-Mantzikos et al. (2023) reported that social isolation predicted general distress in response to misophonic triggers, while insufficient self-control predicted both aggressive and non-aggressive behavioral reactions. In the same study, other schemas showed differential associations with aggressive and non-aggressive responses (e.g., vulnerability to harm or illness, unrelenting standards, dependence/incompetence, and low entitlement). Similarly, Natalini et al. (2020), in a small clinical case series of patients with misophonia and comorbid personality disorders, observed elevated levels of several schemas, particularly unrelenting standards/hypercriticalness, along with other maladaptive patterns, including enmeshment, subjugation, self-sacrifice, approval-seeking, and punitiveness.These findings provide preliminary support for the role of EMSs in misophonia, but remain limited and require further investigation.

Table 1
The five schema domains and the associated EMSs (Young et al., 2003).

Domain	EMSs
1. Disconnection and Rejection	• *Abandonment/Instability* - The expectation that significant others will be unavailable or unreliable. • *Mistrust/Abuse* - The expectation that others will intentionally hurt, humiliate, manipulate, or take advantage of the individual. • *Emotional Deprivation* - The belief that one's need for emotional support, protection, and nurturance will not be met by others. • *Defectiveness/Shame* - The belief that one is inferior, unlovable, or unworthy of acceptance. • *Social Isolation/Alienation* -The sense of being different from others, not belonging, or being excluded from the broader social world.
2. Impaired Autonomy and Performance	• *Dependence/Incompetence* - The belief that one is unable to manage everyday responsibilities without assistance from others. • *Vulnerability to Harm or Illness* - An exaggerated fear of imminent catastrophe or illness. • *Enmeshment/Undeveloped Self* - Excessive emotional involvement with significant others, associated with difficulties in developing a sense of self. • *Failure* - The belief that one is incompetent and destined to fail.
3. Impaired Limits	• *Entitlement/Grandiosity* - The belief that one is superior and entitled to special rights, or exceptions to ordinary rules. • *Insufficient Self-Control/Self-discipline* - A marked difficulty in tolerating frustration, regulating impulses, and sustaining self-discipline.
4. Other-Directedness	• *Subjugation* - The excessive surrender of one's own needs or emotions to avoid conflict, rejection, or abandonment. • *Self-Sacrifice* - The excessive focus on meeting others' needs at one's own expense, often driven by guilt or an exaggerated sense of responsibility. • *Approval-Seeking/Recognition-Seeking* - An overreliance on external validation and approval for self-worth.
5. Overvigilance and Inhibition	• *Negativity/Pessimism* - A pervasive focus on the negative aspects of life, accompanied by the expectation that things are likely to go wrong. • *Emotional Inhibition* - The tendency to suppress emotional expression to avoid disapproval, shame, or loss of control. • *Unrelenting Standards/Hypercriticism* - The belief that one must meet excessively high internalized standards, resulting in perfectionism and persistent self-criticism. • *Punitiveness* - The belief that oneself and others deserve harsh criticism or punishment for mistakes, imperfections, or failures.

Overall, the studies cited above have typically examined personality traits and EMSs separately, limiting our understanding of how these factors may jointly contribute to misophonia. Importantly, it remains unknown whether EMSs account for variance in misophonia severity beyond dispositional traits and general psychopathology. To the best of our knowledge, no study has yet applied a combined approach in this field of research. Such an approach could help clarify the relative contribution of broad personality traits and specific cognitive-emotional schemas in shaping individuals' responses to trigger sounds, thereby providing a clearer understanding of underlying vulnerability factors and informing targeted interventions.

Based on these considerations, the present study aims to further our understanding of misophonia by examining the associations between misophonia severity, EMSs, personality trait dimensions, and

psychological symptoms. Specifically, the study aims to:

1. Examine the associations between misophonia severity, EMSs, personality trait domains, and psychological symptoms;
2. Compare individuals with and without misophonia on EMSs, personality trait domains, and psychological symptoms;
3. Determine which EMSs independently predict misophonia severity and whether these effects remain significant when controlling for anxiety, depression, and personality trait domains.

2. Method

2.1. Participants and procedure

A total of 200 participants were recruited for the study, including 100 individuals with suspected misophonia and 100 control participants, aged 18 to 65 years and matched on key sociodemographic characteristics. An a priori power analysis using Daniel Soper's online calculator indicated that, assuming a medium effect size (Cohen's d = 0.50), a significance level of α = .05, and a desired statistical power of .80, a minimum of 64 participants per group was required. Participants with misophonia were recruited through online support groups dedicated to misophonia on social media platforms, particularly Instagram and Facebook, via study advertisements containing an invitation to participate and a link to complete the questionnaires. Inclusion in the misophonia group required that participants self-identified as having the condition and demonstrated elevated symptom severity and functional impairment, as assessed by the Duke Misophonia Questionnaire (DMQ; Rosenthal et al., 2021). Specifically, participants were included if their scores fell within the moderate or high clinical risk ranges on both the DMQ Symptom scale (DMSS≥43) and the DMQ Impairment scale (DMQ Impairment≥12), indicating marked sound intolerance and significant impairment in daily functioning. The control group was recruited using similar procedures, advertising the study through social media channels unrelated to misophonia. Inclusion in the control group was determined through a group-matching procedure aimed at obtaining a sociodemographic distribution comparable to that of the misophonia group in terms of age, gender, and education level. During recruitment, participant characteristics were continuously monitored, and targeted recruitment advertisements were employed for underrepresented demographic categories (e.g., specific age ranges or gender groups) to approximate the demographic composition of the misophonia group. Additionally, control participants scoring within the moderate or high clinical risk ranges on the DMQ were excluded, to avoid including individuals with reduced sound tolerance. Moreover, participants were excluded from both groups if they were taking psychotropic medication at the time of the study, had experienced hearing loss, or failed one or more of the three attention-check items (e.g., "Please select 'Often' if you are paying attention"). In the misophonia group, 2 participants were excluded due to hearing loss, 7 for failing one or more attention checks, 9 for current psychotropic medication use, and 10 for not meeting the established DMQ cut-off criteria. In the control group, 5 participants were excluded for failing one or more attention checks, 6 for psychotropic medication use, 6 for exceeding the DMQ clinical cut-off, and 11 to maintain demographic comparability between groups. Of the 200 participants initially recruited, data from 144 participants (72 per group) were included in the final analyses. All participants completed the same set of questionnaires in a single online session, presented in a fixed order. The procedure was identical for both the misophonia and control groups, and no counterbalancing of questionnaire order was applied. Due to the characteristics of the online survey platform, information on total completion time was not recorded. Participants did not receive any monetary or other form of compensation for their participation. This study was approved by the Ethics Committee of [*blinded for review*] on December 04, 2025. Participants provided written consent before taking part in the study.

2.2. Instruments

Participants were administered the following self-report questionnaires.

The Duke Misophonia Questionnaire (DMQ; Rosenthal et al., 2021) is an 86-item self-report measure assessing misophonic experiences across multiple dimensions. In the present study, participants completed only two scales derived from the DMQ, the Duke Misophonia Symptoms scale (DMSS) and the DMQ Impairment scale, in their Italian version obtained through a forward-backward translation and cultural adaptation process following the International Test Commission (ITC) Guidelines for Translating and Adapting Tests (2017). The DMSS assesses core emotional (e.g., "*I felt angry*"), physiological (e.g., "*I became rigid or stiff*"), and cognitive reactions (e.g., "*Everything is awful*") to misophonic triggers. The Impairment scale measures the extent to which misophonic symptoms interfere with daily functioning (e.g., "*My ability to be with other people*", "*My performance at work or school*"). Items are rated on a 5-point Likert scale (0 = "never/not at all" to 4 = "always/extremely"), with higher scores indicating greater symptom severity. In the original validation study, marginal reliability was excellent for the DMSS (ρ_{xx} = 0.93) and good for the Impairment scale (ρ_{xx} = 0.80; Rosenthal et al., 2021). In the present sample, Cronbach's α coefficients were .97 for the DMSS and .94 for the Impairment scale, indicating excellent internal consistency.

The Young Schema Questionnaire Short Form-3 (YSQ-S3; Young and Brown, 2005) is a 90-item self-report measure assessing 18 early maladaptive schemas (EMSs), based on the theory proposed by Young et al. (2003). Items are rated on a 6-point Likert scale (1 = "completely false for me" to 6 = "describes me perfectly"), with higher scores indicating a greater presence of maladaptive schemas. Example items include statements such as "*I feel that people will take advantage of me*" and "*I do not feel capable of getting by on my own in everyday life*" The Italian version of the YSQ-S3 has demonstrated good psychometric properties, with McDonald's ω coefficients for the 18 EMSs ranging from .70 (Enmeshment) to .89 (Failure) (Aloi et al., 2020). In the present sample, Cronbach's α coefficients for the 18 schemas ranged from .70 (Enmeshment) to .90 (Failure), indicating acceptable to excellent internal consistency.

The Personality Inventory for DSM-5 Brief Form (PID-5-BF; American Psychiatric Association, 2013b) is a 25-item self-report measure assessing the five trait domains of the Alternative Model of Personality Disorders (AMPD) included in DSM-5 Section III (APA, 2013a): Negative Affectivity (e.g., "*I get emotional easily, often for very little reason*"), Detachment (e.g., "*I often feel like nothing I do really matters*"), Antagonism (e.g., "*It's no big deal if I hurt other people's feelings*"), Disinhibition (e.g., "*I feel like I act totally on impulse*"), and Psychoticism (e.g., "*My thoughts often don't make sense to others*"). Each domain is assessed with five items rated on a 4-point Likert scale (0 = "very false or often false" to 3 = "very true or often true"), with higher scores indicating greater trait pathology. The Italian version of the PID-5-BF has demonstrated adequate psychometric properties, with Cronbach's α coefficients exceeding .70 for all domains (Fossati et al., 2021). In the present sample, Cronbach's α values ranged from .72 (Detachment) to .78 (Psychoticism), indicating acceptable internal consistency. However, the Disinhibition domain showed a lower reliability coefficient (α = .64) and should therefore be interpreted with caution.

The Beck depression inventory-II (BDI-II; Beck et al., 1996) is a self-report measure consisting of 21 sets of statements assessing depressive symptoms. For each set, respondents are asked to select the statement that best describes how they have felt over the past two weeks. Each item is scored on a scale from 0 to 3, with higher scores indicating more severe depressive symptomatology. The Italian version of the BDI-II has shown good internal consistency (Cronbach's α = .80; Sica and Ghisi, 2007). In the present sample, Cronbach's α was .92, indicating excellent internal consistency.

The Abbreviated State-Trait Anxiety Inventory (STAI-Y short; Spielberger et al., 1983) is a self-report measure consisting of two 8-item

subscales: the STAI-S-8, assessing state anxiety (i.e., temporary feelings of anxiety; e.g., "*I feel tense*"), and the STAI-T-8, assessing trait anxiety (i.e., a general tendency to experience anxiety; e.g., "*I feel overwhelmed by difficulties I cannot overcome*"). Items are rated on a 4-point Likert scale (1 = "almost never/not at all" to 4 = "almost always/very much"), with higher scores indicating higher levels of anxiety after reversing the scores of the eight negatively worded items (e.g., "*I'm very calm*"). The Italian version has shown excellent internal consistency, with Cronbach's α coefficients of 0.89 for the STAI-S-8 and 0.87 for STAI-T-8 (Valente et al., 2025). In the present sample, Cronbach's α coefficients were .92 for the STAI-S-8 and .91 for the STAI-T-8, indicating excellent internal consistency.

2.3. Statistical analysis

Statistical analyses were conducted using Jamovi (version 2.6.26.0; The Jamovi project, 2025). Preliminary descriptive statistics were examined for all study variables. Given non-normality in several variables, non-parametric procedures were used when appropriate. Spearman's rank-order correlations were computed to examine the associations between misophonia severity, early maladaptive schemas (EMSs), personality trait domains, depressive symptoms, and anxiety symptoms. Misophonia was assessed using the Duke Misophonia Questionnaire (DMQ). Group differences between participants with and without misophonia were examined using Mann–Whitney U tests. Effect sizes were calculated and reported for each comparison. To reduce the risk of type I error due to multiple testing, p-values for the Mann-Whitney U tests were adjusted using the Benjamini-Hochberg false discovery rate (FDR) procedure. To investigate which early maladaptive schemas were independently associated with misophonia severity, a multiple linear regression analysis was conducted. Based on preliminary exploratory analyses, Entitlement, Social Isolation, Emotional Inhibition, and Pessimism were entered simultaneously as predictors. Collinearity diagnostics (variance inflation factor [VIF] and tolerance values were examined to assess multicollinearity among predictors. Finally, a hierarchical multiple regression analysis was conducted to examine whether EMSs predicted misophonia severity beyond depressive symptoms, anxiety, and personality trait domains. In the first step, depression (BDI), state and trait anxiety (STAI-S and STAI-T), and personality domains (Negative Affectivity, Detachment, and Psychoticism) were entered. In the second step, Entitlement, Social Isolation, Emotional Inhibition, and Pessimism were added. The change in explained variance (ΔR^2) was used to assess the incremental contribution of EMSs.

3. Results

3.1. Participants characteristics

The sociodemographic characteristics of the misophonic and control samples are reported in Table 2. The two groups did not significantly differ in age, with comparable mean values (misophonic sample: M = 39.43, SD = 10.5; control sample: M = 39.00, SD = 11.9; p = .636). Similarly, no significant differences were found in sex or gender identity distribution, with females comprising 80.6 % of both groups (p = 1.000). Furthermore, no significant group differences emerged in marital status (p = .991) or education level (p = .293), indicating that the samples were well matched on these variables. However, a significant difference was found in sexual orientation (p = .035), with the misophonic sample showing a greater variability, including a higher proportion of bisexual participants (6.9 %) compared to the control group (0 %).

Table 2
Sociodemographic characteristics of the samples.

	Misophonic sample (N = 72)	Control sample (N = 72)	p-value[1]
Age (mean, SD)	39.43 (10.5) Range = 19–63	39 (11.9) Range = 18–62	0.636
Sex (*n*, %)			1.000
Male	14 (19.4)	14 (19.4)	
Female	58 (80.6)	58 (80.6)	
Gender Identity (*n*, %)			1.000
Male	13 (18.1)	14 (19.4)	
Female	58 (80.6)	58 (80.6)	
Transgender male	0 (0)	0 (0)	
Transgender female	0 (0)	0 (0)	
Genderqueer	0 (0)	0 (0)	
Additional gender category	1 (1.4)	0 (0)	
Choose not to disclose	0 (0)	0 (0)	
Sexual Orientation (*n*, %)			0.035
Heterosexual	65 (90.3)	71 (98.6)	
Homosexual	2 (2.8)	1 (1.4)	
Bisexual	5 (6.9)	0 (0)	
Something else	0 (0)	0 (0)	
Choose not to disclose	0 (0)	0 (0)	
Marital status (*n*, %)			0.991
Single	31 (43.1)	33 (45.8)	
Married	23 (31.9)	23 (31.9)	
Separated	1 (1.4)	1(1.4)	
Divorced	2 (2.8)	1 (1.4)	
Living with partner	15 (20.8)	14 (19.4)	
Education (*n*, %)			0.293
None	0 (0)	1(1.4)	
Middle school	0 (0)	1 (1.4)	
High School graduate	21 (29.2)	18 (25)	
Bachelor's degree	12 (16.7)	8 (11.1)	
Master's degree	19 (26.4)	14 (19.4)	
Doctoral degree	20 (27.8)	30 (41.7)	

[1] Mann–Whitney U test for continuous variables; Fisher's exact test or Chi-squared test for categorical variables, as appropriate.

3.2. Associations between misophonia, schemas, personality and symptoms

Spearman correlation analyses showed that misophonia was positively associated with most EMSs. In particular, the strongest associations with the DMQ Composite Symptoms scale (DMSS) emerged for Entitlement (rho = .49), Social Isolation (rho = .49), Insufficient Self-control (rho = .46), and Emotional Inhibition (rho = .46). Significant positive associations were also observed for remaining EMSs, except for Dependence, Enmeshment, and Recognition-seeking (Table 3).

Table 3
Correlations between early maladaptive schemas and DMSS total score.

EMSs	DMSS
Emotional deprivation	0.37***
Abandonment	0.37***
Mistrust	0.41***
Social isolation	0.49***
Defectiveness	0.35***
Failure to achieve	0.34***
Dependence	0.25
Vulnerability	0.43***
Enmeshment	0.22
Subjugation	0.35***
Self-sacrifice	0.31***
Emotional inhibition	0.44***
Unrelenting standards	0.33***
Entitlement	0.49***
Insufficient self-control	0.46***
Recognition-seeking	0.29
Pessimism	0.42***
Self-punitiveness	0.34***

*** p<.001.

With regard to personality traits, misophonia was significantly and positively associated with Negative Affectivity (rho = .47), Detachment (rho = .36), and Psychoticism (rho = .31), whereas Antagonism and Disinhibition were not significantly associated with misophonia (Table 4).

Misophonia was also significantly and positively associated with depressive symptoms and anxiety, with correlations of .46 for the BDI, .45 for the STAI-S, and .46 for the STAI-T (Table 5).

3.3. Group differences between participants with and without misophonia

Participants with misophonia scored significantly higher than controls on all EMSs included in the analyses. The largest effects were observed for Social Isolation, Emotional Inhibition, Entitlement, and Pessimism (Figs. 1–4). Effect sizes were generally in the moderate-to-large range (Table 6). Results remained significant after FDR correction for multiple comparisons.

Participants with misophonia also reported significantly higher levels of maladaptive personality trait domains, including Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism (Table 7). In addition, they showed significantly higher depressive symptoms and both state and trait anxiety than controls (Table 8). Results remained significant after FDR correction for multiple comparisons.

3.4. Early maladaptive schemas as predictors of misophonia severity

A multiple linear regression analysis was conducted including Entitlement, Social Isolation, Emotional Inhibition, and Pessimism simultaneously. The overall model was significant, $F(4, 139) = 21.10$, $p < .001$, and explained 37 % of the variance in misophonia severity ($R^2 = .37$, adjusted $R^2 = .35$). Collinearity diagnostics indicate no evidence of problematic multicollinearity among the predictors (VIFs = 1.45–2.20; tolerance = 0.45–0.69). Within this model, Entitlement was a significant independent predictor ($\beta = .29$, $p < .001$), followed by Emotional Inhibition ($\beta = .21$, $p = .02$). Pessimism showed a marginal association with misophonia severity ($\beta = .15$, $p = .08$), whereas Social Isolation was not a significant independent predictor ($\beta = .10$, $p = .30$) (Table 9).

3.5. Incremental contribution of schemas beyond symptoms and personality

A hierarchical multiple regression analysis was conducted to examine whether early maladaptive schemas predicted misophonia severity beyond depressive symptoms, anxiety, and personality trait domains. The first model, including depression, anxiety, and personality trait domains, was significant, $F(6, 137) = 12.33$, $p < .001$, explaining 35 % of the variance ($R^2 = .35$). The addition of the selected EMSs in the second step significantly improved the model, $\Delta R^2 = .07$, $F(4, 133) = 4.42$, $p = .002$, indicating that schemas explained an additional 7 % of variance in misophonia severity (Table 10). In the final model, Entitlement emerged as a significant predictor ($\beta = .26$, $p = .003$), while Emotional Inhibition showed a marginal effect ($\beta = .17$, $p = .07$). Negative Affectivity was also a significant predictor ($\beta = .22$, $p = .03$), whereas all other variables were not significant (Table 11).

Table 4
Correlations between misophonia and personality trait domains.

Personality trait domains	DMSS
Negative affectivity	0.47***
Detachment	0.36***
Antagonism	0.27
Disinhibition	0.27
Psychoticism	0.31***

*** p<.001.

Table 5
Correlations between misophonia and depression and anxiety symptoms.

Symptoms	DMSS
BDI	0.46***
STAI-Y-S	0.45***
STAI-Y-T	0.46***

*** p<.001.

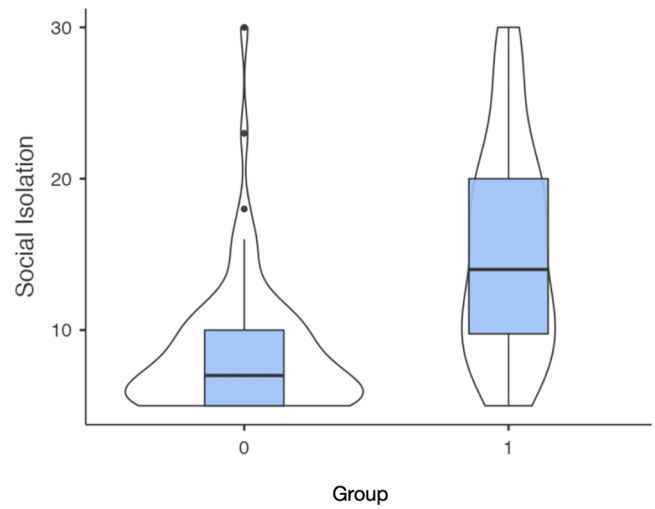

Fig. 1. Group differences in Social Isolation schema between participants with misophonia and healthy controls.
Note: 0 = controls, 1 = cases.

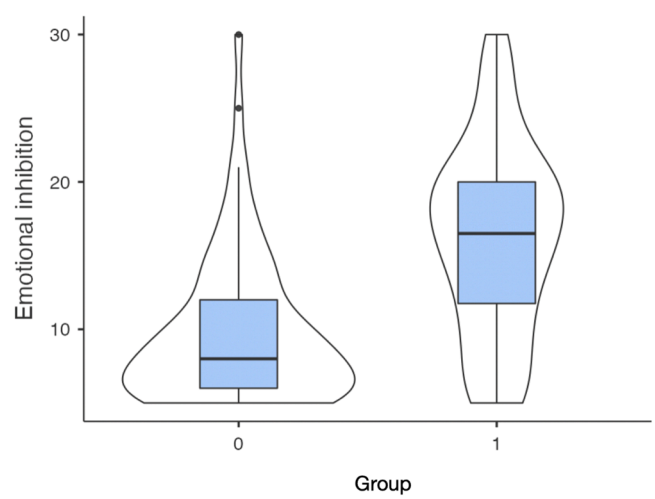

Fig. 2. Group differences in Emotional Inhibition schema between participants with misophonia and healthy controls.
Note: 0 = controls, 1 = cases.

4. Discussion

The present study aimed to investigate the associations between misophonia severity, early maladaptive schemas (EMSs), personality trait domains, and psychological symptoms, as well as to determine their unique contribution to misophonic symptomatology. Overall, the findings support a multifactorial model in which both broad dispositional traits and more specific cognitive-emotional patterns contribute to the

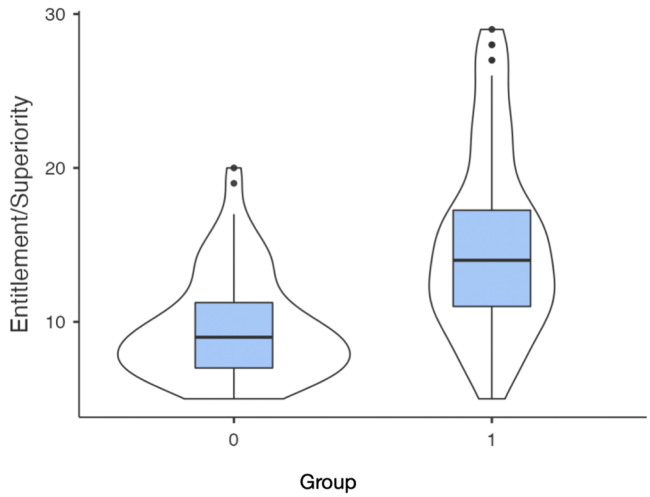

Fig. 3. Group differences in Entitlement schema between participants with misophonia and healthy controls.
Note: 0 = controls, 1 = cases.

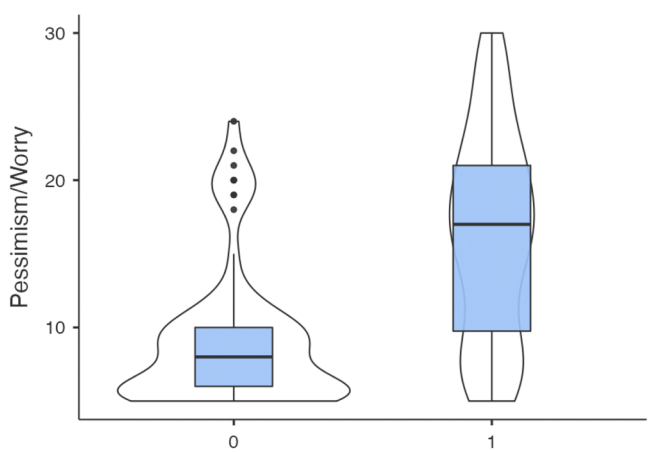

Fig. 4. Group differences in Pessimism schema between participants with misophonia and healthy controls.
Note: 0 = controls, 1 = cases.

severity of misophonia. Consistent with previous literature, misophonia was positively associated with a wide range of EMSs (Stalias-Mantzikos et al., 2023), maladaptive personality dimensions (Colak et al., 2021; Daniels et al., 2020; McKay et al., 2018), and internalizing symptoms (Cassiello-Robbins et al., 2021; Rosenthal et al., 2022; Siepsiak et al., 2020) at the correlational level. However, a more differentiated pattern emerged in multivariate analyses. While several EMSs showed moderate-to-strong associations with misophonia severity, only a subset, particularly Entitlement and Emotional Inhibition, retained independent predictive power. Similarly, among personality trait domains, only Negative Affectivity remained significantly associated with misophonia severity in the final model, whereas depressive and anxiety symptoms did not contribute uniquely once other variables were accounted for. These findings suggest that, while high levels of Negative Affectivity - conceptualized as a disposition to experience aversive emotional states (Fossati et al., 2021) - may increase susceptibility to misophonic reactions, it is the presence of specific schema-driven cognitive-emotional patterns that more directly influences how trigger sounds are interpreted and experienced. Consistent with this interpretation, EMSs explained additional variance in misophonia severity beyond personality trait domains and psychological symptoms, highlighting their role as distinct and clinically meaningful vulnerability factors.

Table 6
Group differences in early maladaptive schemas between participants with misophonia and healthy controls.

EMSs	Mann-Whitney U	df	p	Effect size	Mean (SD) Controls	Mean (SD) Cases
Emotional deprivation	1207	142	<.001	0.53	8.04 (4.23)	13.80 (7.18)
Abandonment	1177	142	<.001	0.54	8.24 (3.96)	13.60 (6.17)
Mistrust	1251	142	<.001	0.51	8.68 (4.05)	14.50 (6.67)
Social isolation	966	142	<.001	0.62	8.51 (4.39)	15.20 (6.85)
Defectiveness	1258	142	<.001	0.51	6.90 (3.93)	11.10 (5.97)
Failure to achieve	1468	142	<.001	0.43	8.25 (5.23)	12.20 (6.57)
Dependence	1885	142	0.004	0.27	7.04 (3.46)	8.64 (4.52)
Vulnerability	1278	142	<.001	0.50	8.28 (4.19)	13.50 (6.43)
Enmeshment	1965	142	0.01	0.24	7.61 (2.81)	9.74 (5.00)
Subjugation	1454	142	<.001	0.43	8.58 (3.55)	12.30 (5.46)
Self-sacrifice	1728	142	<.001	0.33	14.60 (4.68)	17.80 (5.82)
Emotional inhibition	1130	142	<.001	0.56	9.78 (5.09)	16.10 (6.44)
Unrelenting standards	1333	142	<.001	0.48	13.20 (4.77)	17.80 (5.36)
Entitlement	1079	142	<.001	0.58	9.63 (3.41)	15.10 (5.91)
Insufficient self-control	1244	142	<.001	0.52	9.53 (4.53)	14.50 (5.80)
Recognition seeking	1595	142	<.001	0.38	10.80 (5.30)	15.10 (6.86)
Pessimism	1108	142	<.001	0.57	9.22 (4.84)	16.30 (7.02)
Self-punitiveness	1382	142	<.001	0.46	9.35 (4.73)	13.50 (5.44)

Table 7
Group differences in personality trait domains between participants with misophonia and healthy controls.

Personality trait domains	Mann-Whitney U	df	p	Effect size
Negative affectivity	978	142	<.001	0.62
Detachment	1296	142	<.001	0.50
Antagonism	1712	142	<.001	0.34
Disinhibition	1903	142	0.006	0.26
Psychoticism	1631	142	<.001	0.37

Table 8
Group differences in anxiety and depression symptom scores between participants with misophonia and healthy controls.

Symptoms	Mann-Whitney U	df	p	Effect size
BDI	1156	142	<.001	0.55
STAI-Y-S	1087	142	<.001	0.58
STAI-Y-T	900	142	<.001	0.65

Among the schemas examined, Entitlement emerged as the strongest and most consistent independent predictor of misophonia severity. This schema reflects expectations that one's needs and standards should be respected by others, along with a reduced tolerance for behaviors perceived as inappropriate or inconsiderate. Within the context of misophonia, this cognitive pattern may increase the likelihood that trigger sounds produced by others are interpreted as violations of social

Table 9
Multiple linear regression analysis.

R^2	Adjusted R^2	F	gdl1	gdl2	p		
0.37	0.35	21.1	4	139	<.001		
Predictor	Estimate	SE	t	p	Standardized	VIF	Tolerance
Entitlement	1.48	0.40	3.67	<.001	0.29	1.45	0.69
Social isolation	0.43	0.41	1.04	0.30	0.10	2.20	0.45
Emotional inhibition	0.89	0.39	2.28	0.02	0.21	1.94	0.51
Pessimism	0.61	0.36	1.72	0.08	0.15	1.84	0.54

Table 10
Hierarchical linear regression predicting DMSS total scores (comparison between models).

Model	R^2	ΔR^2	F	p	ΔF	p for ΔF
1	0.35	-	12.33	<.001		
2	0.42	0.07	9.90	<.001	4.42	.002

Table 11
Hierarchical linear regression predicting DMSS total scores (final model).

Predictor	B	SE	p	β
BDI	−0.18	0.31	0.56	−0.06
STAI-S	0.92	0.59	0.12	0.18
STAI-T	0.11	0.75	0.87	0.02
Negative affectivity	1.65	0.77	0.03	0.22
Detachment	0.02	0.84	0.97	0.002
Psychoticism	−0.74	0.76	0.33	−0.08
Entitlement	1.31	0.43	0.003	0.26
Social isolation	0.32	0.43	0.45	0.07
Emotional inhibition	0.74	0.42	0.07	0.17
Pessimism	0.05	0.44	0.89	0.01

norms or as disrespectful behaviors. In turn, this appraisal may heighten both emotional distress and overall internal reactivity to triggers, including physiological arousal and maladaptive cognitive reactions, such as intrusive thoughts, urges to escape, and aggressive ideation toward the source of the sound. This interpretation aligns with previous findings suggesting that individuals with misophonia often consider trigger sounds as intentional with others perceived as disrespectful, inconsiderate, or even deliberately provocative (Gregory and Foster, 2023; Natalini et al., 2024; Woolley et al., 2026). At the same time, the present findings extend those reported by Stalias-Mantzikos et al. (2023), who found that lower levels of Entitlement were associated with more non-aggressive coping responses to misophonic triggers. Rather than reflecting a discrepancy, these results may capture different aspects of misophonic responses. Specifically, Stalias-Mantzikos et al. (2023) employed the New York Misophonia Scale (NYMS; Barahmand et al., 2023), which primarily assesses general emotional distress and observable behavioral reactions to trigger sounds. In contrast, the present study used the DMQ Composite Symptoms scale, which captures a broader range of internal responses, including affective, physiological, and cognitive components, such as perceived inability to tolerate the sound, urgency to escape, and aggressive or confrontational thoughts. Within this framework, Entitlement may play a pervasive role by amplifying internal reactivity across multiple domains. However, as the present study did not assess observable behavioral responses, it remains unclear whether heightened internal reactivity translates into more aggressive coping strategies. In this context, it is not surprising that Stalias-Mantzikos et al. (2023) found lower levels of Entitlement to be associated with more compliant and non-aggressive coping responses, as individuals with low entitlement may be more inclined to tolerate discomfort and inhibit aggressive impulses in order to adhere to social norms. Overall, Entitlement appears to shape internal reactivity while potentially influencing behavioral regulation.

Emotional Inhibition also emerged as a significant independent predictor of misophonia severity. This schema reflects a tendency to suppress emotional expression and to exert excessive control over internal states. Individuals high in Emotional Inhibition may experience intense affective and physiological responses to trigger sounds but lack adaptive strategies for processing or expressing these reactions. As a result, emotional arousal may remain internalized and prolonged, contributing to heightened distress. Although this schema was not identified as a significant predictor in Stalias-Mantzikos et al. (2023), the discrepancy may again be attributable to differences in measurement. Emotional Inhibition may primarily influence internal reactivity rather than observable behavioral responses, which were the primary focus of that study.

Regarding Social Isolation, the present findings partially replicate previous research showing a strong association between this schema and misophonia (Stalias-Mantzikos et al., 2023). However, although Social Isolation was significantly correlated with misophonia severity, it did not emerge as an independent predictor in multivariate analyses. This pattern suggests that its effects may overlap with or be mediated by other schemas, such as Entitlement or Emotional Inhibition. Alternatively, Social Isolation may represent a downstream consequence of repeated misophonic experiences, as individuals progressively withdraw from social contexts to avoid exposure to triggering sounds.

Taken together, these findings can be interpreted within a hierarchical framework in which Negative Affectivity represents a broad dispositional vulnerability to experience negative emotional states, while EMSs provide a more specific level of explanation by shaping the cognitive appraisal and emotional meaning of trigger stimuli. In this context, schemas may act as filters through which sensory input is interpreted, influencing both the attribution of intent to others and the individual's emotional and behavioral responses. This perspective aligns with transdiagnostic models emphasizing the role of shared cognitive-emotional mechanisms across different forms of psychopathology (Aldao et al., 2010; Cludius et al., 2020).

From a clinical standpoint, the results highlight the potential relevance of targeting EMSs in the treatment of misophonia. Interventions such as Schema Therapy or Metacognitive Interpersonal Therapy may be particularly well suited to address these underlying cognitive-emotional patterns. For example, interventions targeting Entitlement may focus on modifying rigid expectations regarding others' behavior and promoting more flexible interpersonal interpretations, whereas interventions targeting Emotional Inhibition may aim to enhance emotional awareness, expression, and regulation. Addressing these schemas may reduce the intensity of emotional responses to trigger sounds and improve overall functioning.

In conclusion, these findings underscore the role of EMSs as specific cognitive-emotional vulnerability factors in misophonia, beyond broader dispositional traits and general psychological symptoms. Importantly, they provide initial evidence for the incremental contribution of EMSs to misophonia severity. Future studies with larger samples could explore the latent structure of early maladaptive schemas in misophonia using dimension reduction approaches, such as principal component analysis or factor analysis, to determine whether broader schema dimensions account for misophonia severity.

5. Limitations and future directions

Several limitations of the present study should be acknowledged. First, the study design does not allow for causal inferences regarding the relationships among misophonia, EMSs, personality trait domains, and psychological symptoms. Second, the use of self-report measures and the identification of misophonia based on self-report criteria rather than formal clinical diagnosis, may have introduced response biases and limit the generalizability of the findings. In addition, the recruitment of participants through online communities may have resulted in a sample characterized by higher symptom severity and reduced representativeness. Moreover, because participants with misophonia were recruited through online support groups whereas controls were recruited through general social media channels, a potential selection bias related to help-seeking behaviors or personality characteristics cannot be excluded. Although the sample size was sufficient for the planned analyses, it may have limited the detection of smaller effects and the stability of more complex multivariate models. Finally, the predominance of female participants and group differences in sexual orientation may further limit generalizability. Future research would benefit from longitudinal designs, multimethod assessments, and clinically diagnosed samples. Recruitment strategies involving control groups drawn from other health or support-related online communities may also help control for potential recruitment-related biases and clarify the mechanisms underlying misophonia.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the authors used ChatGPT 5.3 (OpenAI, 2026) to enhance the clarity and readability of the text. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

CRediT authorship contribution statement

Michela Fazi: Writing – original draft, Resources, Project administration, Investigation, Data curation, Conceptualization. **Francesco Mancini:** Writing – review & editing, Supervision, Conceptualization. **Allison Uvelli:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis. **Sofia Mattioli:** Writing – original draft, Resources, Investigation, Data curation. **Chiara Tonasso:** Writing – original draft, Resources, Investigation, Data curation. **Lucia Fiumalbi:** Writing – original draft, Resources, Investigation, Data curation. **Giuseppe Romano:** Writing – review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare no competing interests.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.heares.2026.109756.

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