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Title: Journal of obsessive-compulsive and related disorders.

ArticleTitle: Misophonia: A psychological model and proposed treatment

ArticleAuthor: Cowan

Vol: 32 Date: Jan 2022 Pages: 100691-

OCLC - 990385299; ISSN - 22113649; LCN - 2012263062;

Publisher: Amsterdam : Elsevier

Source: LibKeyNomad

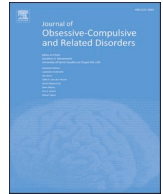
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Misophonia: A psychological model and proposed treatment

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ARTICLE INFO

Keywords:

Misophonia
Sound sensitivity
Acceptance-based psychotherapy
Obsessive-compulsive personality disorder (OCPD)
Perfectionism
Rigidity

ABSTRACT

Misophonia is a condition characterized by strong reactions to specific sounds which are usually emitted by other people. The condition can be debilitating due to the distress and avoidance that it involves, at times resulting in significant occupational and relational dysfunction. The aim of this paper is to offer a theoretical account that can explain the phenomenology of misophonia that has been reported in the literature. To this end, we argue that misophonia emerges out of a rigid character style in combination with contextual factors and classical and operant conditioning processes. Based on this model, we also offer a treatment approach called experiential acceptance and stimulus engagement (EASE). It consists of three main components: ending toxic hope, reduction of avoidance, and stimulus engagement.

Misophonia is a condition characterized by the experience of intense negative emotions in reaction to specific sounds (Jastreboff & Jastreboff, 2002). The emotional response is often described as strong feelings of anger or annoyance towards the source of the sound, which is typically another person. The most common sound triggers are made by the mouth and include chewing, crunching, lip-smacking, and sipping. Further, other triggers include repetitive sounds such as foot tapping and pen clicking (Edelstein et al., 2013). While anger is the most commonly reported reaction, irritability, annoyance, anxiety, and disgust may also be experienced (Rouw & Erfanian, 2018). Many sufferers report experiencing violent urges towards the source of the sound, although rarely do any act on their urges (Schröder et al., 2013). Many also report a strong physiological response, including the body tensing up and other reflexive behaviors (Dozier et al., 2017; Schwartz et al., 2011). Individuals experiencing misophonia describe not only distress upon hearing these sounds but also a state of anxious apprehension and hypervigilance for future occurrences of the sound (Edelstein et al., 2013). Moreover, these individuals report avoiding places where they will likely encounter unwanted sounds, such as the family dinner table, leading in many cases to reduced quality of life and functional impairment (Schröder et al., 2013). Indeed, some patients distance themselves from the people they are closest to, resulting in social isolation (Schwartz et al., 2011). Patients report often engaging in coping

behaviors involving blocking out sounds using headphones and other devices, although these methods are often found to be impractical (Frank & McKay, 2019). The significant distress and social and occupational dysfunction associated with misophonia make it a public health concern. As yet, however, misophonia has not been categorized as a discrete disorder for diagnostic purposes, although some have argued that it should receive this status based on the reduced functioning associated with it (Schröder et al., 2013).

The prevalence rate for misophonia is not yet known despite several calls for additional epidemiological research (Cavanna & Seri, 2015; Dozier et al., 2017; Taylor, 2017). In a study which surveyed 483 undergraduate students, 22.8% reported that they were “often” or “always” sensitive to specific sounds (Wu et al., 2014). In a different undergraduate sample ($N = 336$), 49.1% reported significant symptoms of misophonia, with 37% reporting mild symptoms, 12% reporting moderate symptoms, and only 0.03% reporting severe symptoms (Naylor et al., 2020). Jastreboff and Jastreboff (2014) estimated that 3.2% of the population suffers from the condition, which would make it more common than OCD and related disorders. Misophonia was first recognized and treated within the context of tinnitus treatment, as high comorbidity rates have been observed between the two conditions (Jastreboff & Jastreboff, 2002). Misophonia has been reported to be comorbid with other conditions, as well, such as obsessive-compulsive

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personality disorder (OCPD), post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), and mood disorders (Schroder et al., 2013). The average age of onset has been consistently reported to be in childhood or adolescence, with symptoms often worsening over time (Edelstein et al., 2013; Rouw & Erfanian, 2018).

Currently, the etiology of misophonia remains unclear with no comprehensive theoretical framework available to explain the various symptoms associated with the condition. Jastreboff and Jastreboff (2002) have offered a neurophysiological model to explain the condition, which is discussed explored later in this paper. While understanding neurophysiological contributors to misophonia symptoms is important, the growing body of research suggests that there are salient psychological variables at play in this condition, which may hold the keys to the development of a comprehensive treatment. The aim of this paper is to highlight some of these psychological processes through a critical review of important findings that have emerged in misophonia research. Through examination of these factors, the paper will offer a psychological framework for understanding the development and maintenance of misophonia symptoms. Finally, a treatment approach that follows from this psychological model will be outlined. To achieve these aims, the paper is divided into three sections. The first section will critically review prominent features of misophonia, which we believe offer direction for the development of a psychological model. These findings consist of contextual variables often associated with misophonia and visual triggers for the misophonia response. In the second section, we will suggest a theoretical model for misophonia that incorporates these factors, as well as findings that personality-related variables (e.g., rigidity, rule-governed behavior) may play a substantial role in development of the condition. Lastly, in the third section, a treatment approach will be proposed. Within the treatment section, we will also discuss some of the potential obstacles to misophonia treatment and ways to effectively address them.

1. Misophonia: important findings and questions

One intriguing phenomenon consistently reported by the majority of patients diagnosed with misophonia is the adverse reaction to sounds which emanate from *specific* individuals. Edelstein et al. (2013) found that 82% of their clinical sample ($N = 11$) reported that the sound triggers were localized around certain individuals, often family members. This phenomenon is also reported in almost all of the misophonia case studies (Bernstein et al., 2013; Johnson et al., 2013; McGuire et al., 2015; Neal & Cavanna, 2013). Why, we might ask, would someone be triggered only by one person making the specific sound and not another? Further, even with individuals that experience the same reaction in response to many people (e.g. family, friends, and strangers), the strength of the response is not the same across all individuals. That an individual develops such a unique reaction to the behavior of specific individuals suggests that there is, at least in part, a context-specific reaction and not a general neurological deficit that results with heightened sensitivity to specific sounds. Further, individuals with misophonia report they experience no differences in response to sounds that the general population find aversive (Kumar et al., 2017) indicating that the response is not a general sensitivity to all sounds, and denoting a possible contextual explanation.

A second finding of importance is that a significant portion of patients with misophonia are not only triggered by sounds, but also experience a similar reaction to visual stimuli (Dozier, 2015; Edelstein et al., 2013; Johnson et al., 2013; Schroder et al., 2013). These include repetitive movements, such as shaking of the leg or other body parts. The fact that patients with misophonia report that they experience anger in reaction to both auditory and visual triggers leads to questions about the importance of the perceptual source relative to how the individual reacts to any stimulus – auditory or visual – in a situation. This is significant as a substantial portion of the literature on misophonia has viewed the problem as an audiological condition. Indeed, misophonia was first

identified by audiologists and assumed to be primarily a hearing-related concern. Yet the phenomenology of the condition appears to be broader than hearing alone. That many individuals who experience anger in the context of specific sounds also experience it from visual cues suggests that it is something in the interpersonal context that makes these perceptions so deeply bothersome. Any adequate conceptual model of misophonia will need to account for this finding.

In summary, there are two findings associated with misophonia which seem to be vital in further understanding the condition. First, most patients presenting with misophonia report that they respond to sounds from specific people, often family members (Edelstein et al., 2013). Second, these individuals report similarly intense negative reactions to both auditory and visual stimuli (Edelstein et al., 2013). Our aim in the next section is to develop a psychological model for misophonia which will address these two points.

2. A psychological model of misophonia

While there is currently no comprehensive psychological model for misophonia, existing explanations of the phenomenon do include psychological variables. Some have pointed out that Jastreboff and Jastreboff's (2002) neural mechanism model of misophonia is supported by classical conditioning, given that it postulates that patients with misophonia have an enhanced connection between their limbic system, autonomic nervous system, and auditory system (Palumbo et al., 2018). Accordingly, anger would be the unconditioned response and the sound triggers acting as the conditioned stimulus (Palumbo et al., 2018). Operant conditioning is also present as exhibited by the avoidance of the sounds, which negatively reinforces the association between the negative affect and the sound triggers (Palumbo et al., 2018). Moreover, avoidant behaviors and the use of anger expression as stimulus control are also negatively reinforced to the extent that they reduce exposure to the aversive sound trigger.

While we agree that classical conditioning is important to understanding misophonia, we would argue that this specific conceptualization does not fully explain the learning from a Pavlovian perspective. We agree that sound triggers serve as the conditioned stimulus and that the anger serves as both the unconditioned and conditioned responses. What needs to be clarified, however, is what constitutes the unconditioned stimulus in this model. That is, what is the variable which originally elicited the anger response which came to be associated with the sound trigger? What makes one person initially respond with anger that would establish the conditions for Pavlovian learning? We believe that the unconditioned stimulus in this case pertains to both the relational context and the psychological profile of patient – specifically, the patient's personality, cognitions and emotions, and experiential avoidance.

2.1. Personality traits

Psychological factors that can contribute to responding to a neutral sound with intense negative emotions include features of the patient's character (i.e., the style of interpersonal behavior). One potential personality trait, which could potentially be related to the development of misophonia, are traits of rigidity, inflexibility, and a strong need for control. This is indicated by the high rates of traits of obsessive-compulsive personality disorder (OCPD) and perfectionism found to be associated with misophonia. Prior to reviewing these findings, it is may be useful to offer some background on OCPD and perfectionism. The former is described in the *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013)* as a “pervasive pattern of preoccupation with orderliness, perfectionism, and mental and interpersonal control, at the expense of flexibility, openness and efficiency as indicated by four (or more)” traits (p. 678). The *DSM-5* lists eight traits associated with OCPD: (a) excessive preoccupation with details, (b) task-interfering perfectionism, (c)

excessive devotion to work resulting in diminished leisure and friendship activities, (d) inflexibility about moral and ethical standards, (e) hoarding behavior, (f) shows difficulty in task delegation, (g) miserliness, and (h) exhibits rigidity and stubbornness. A subset of individuals with OCPD are typically seen as rigid and overly controlling as they are excessively concerned about doing things the “right” way (Pinto, 2016). They tend to experience significant interpersonal difficulties as a result of setting impossibly high standards that can lead to reactions of anger and hostility when not met (Pollack, 1987). Relatedly, perfectionism is often considered a multidimensional construct characterized by a strong aversion of making mistakes, high personal standards, perception of high parental expectations and parental criticism, doubting quality of one’s actions, and a strong preference for order (Frost et al., 1990).

As indicated above, rigidity and associated traits have been found to be highly prevalent among individuals with misophonia. For example, Schröder et al. (2013) found that 52% of their misophonia clinical sample ($N = 42$) met full criteria for OCPD. This was the highest comorbidity rate found in their study, followed by a 7% comorbidity with mood disorders. The authors suggested that a potential hypothesis for the etiology of misophonia is that the pattern of behavior found in OCPD predisposes misophonia. Further they suggested that “a morally strict person may have difficulties coping with impolite eating sounds, eventually resulting in avoidance.” In a subsequent study with a significantly larger misophonia clinical sample ($N = 575$), 26% reported traits of OCPD (Jager et al., 2020). Most notably, they also found that 97% of their sample reported symptoms of clinical perfectionism. Edelstein et al. (2013) found 18% of their sample reporting traits of obsessive-compulsive personality. Rouw and Erfanian (2018), however, found an 8% comorbidity rate. The large disparity between the findings are likely due to differences in methodology between the studies. Specifically, Schröder et al. (2013) and Jager et al. (2020) conducted full structured interviews, whereas Rouw and Erfanian (2018) asked the participants to indicate if they had a diagnosis from a list of disorders, one of which was OCPD. From our clinical observations, individuals meeting criteria for OCPD may not be aware that they demonstrate these characteristics. Indeed, personality conditions typically require a degree of insight to realize that their challenges are related to their personality. That said, 8% still is a notable comorbidity rate despite these methodological limitations and is consistent with other findings. Further, across all of these studies misophonia had significantly higher comorbidity rate with OCPD traits relative to any other diagnosis.

Rigidity and inflexibility was also reported in all published misophonia case studies that we are aware of. In a study of three patients with misophonia, all three patients were found to meet full criteria for OCPD (Natalini et al., 2019). Consistently, all three presented with schemas of “unrelenting standards/hypocriticalness.” In another study, a 14-year-old female being treated for misophonia was described by her parents “as a high achiever with a history of perfectionistic tendencies” who “showed signs of scrupulosity at a young age, with excessive concern for following rules and not hurting her friends’ feelings” (Muller et al., 2018). In a study which reported on two cases, one of the patients was a 29-year-old married female who was described by her husband as “meticulous, huffy,” and “prescriptive” (Hocaoglu, 2018). The authors added that this patient was reported to have a “rigorous, prescriptive, and punctual personality since her adolescence.” Further, on the Minnesota Multiplex Personality Inventory (MMPI), which they administered, they found she “could have a perfectionistic attitude.” The second patient’s MMPI also yielded this finding. Lastly, Kluckow et al. (2014) explored the relationship between eating disorders and misophonia in three patients. In screening for personality factors, they found that all three patients reported features of OCPD.

Rigidity in misophonia was also indicated in a study which perhaps took the closest look at the relationship between personality and misophonia (Cassello-Robins et al., 2021). Using both the SCID-I and SCID-II, they found in their clinical sample ($N = 49$) that full criteria for OCPD was met by 10.2%, 12.2% for borderline personality disorder

(BPD), and 8.2% for avoidant personality disorder (APD). Natalini et al. (2019) also found in her case study of three patients, at least one met criteria for BPD and one for APD. Both BPD and APD exhibit an avoidant and inflexible disposition; while the underlying reasons for avoiding may be different in these conditions (e.g. interpersonal rejection and/or abandonment) an inflexible disposition is generally present.

2.2. Rigidity-related cognitions and emotions in misophonia

Findings suggesting a relationship between misophonia and rigidity are consistent with research related to the cognitions and emotions of misophonia patients. For example, McKay et al. (2018) found that the cognitions associated with misophonia are an inflated sense of responsibility, perfectionism, and intolerance for uncertainty. Individuals with rigidity often engage in perfectionistic behaviors and hold exceedingly high standards for themselves (Pinto, 2016), which can generate an inflated sense of personal responsibility. Holding high and rigid standards is also consistent with the finding that the majority of patients with misophonia described the trigger sounds as invasive, intrusive, insulting, violating, offensive, disgusting, and rude (Edelstein et al., 2013), suggesting that they held an expectation or judgement that people *should not* make these sounds and that this expectation was violated. Intolerance of uncertainty has also been found to be significantly associated with rigidity (Gallagher et al., 2003), and is highly consistent with the environmental and situational control that individuals with rigidity seek to exercise.

The emotions associated with misophonia are also consistent with the rigid personality profile. As indicated above, common misophonic reactions to sounds are anger, annoyance, disgust, and irritability (Edelstein et al., 2013; Jastreboff & Jastreboff, 2002). Increased anger and irritability are often experienced by individuals with OCPD characteristic features (Pollack, 1987). Their high standards and rigid expectations for themselves and their environment may lead to anger when unwanted or unanticipated events or experiences occur. Consistent with this, findings indicates that when experiencing lower levels of anger, patients are less likely to experience misophonic reactions to their typical triggering sources (Natalini et al., 2019). For example, one reported absence of a misophonic reactions from his typical triggering source because he felt guilty about something he did towards that person. Another example involved a female patient who did not experience the reaction when she felt her husband was affectionate towards her.

2.3. Experiential avoidance in rigidity

Another variable that is likely to play an important role in the development of misophonia is experiential avoidance (EA). A transdiagnostic construct, EA is defined as an unwillingness to be in contact with unpleasant, uncomfortable, aversive private experiences, including bodily sensations, memories, and feelings, as well as engagement in behaviors and actions to evade these unwanted experiences and the events which elicit them (Hayes et al., 1996). EA is associated with a range of psychopathology, particularly mood and anxiety disorders (Chawla & Ostafin, 2007). The basic premise of EA is that it is not the experiencing of the unpleasant stimulus which is problematic but rather how one *relates* to the experience. Within the context of misophonia this appears relevant as individuals often attempt to avoid and rid themselves of the aversive experience associated with the sound triggers.

EA is believed to play a role in the functional impairment associated with several conditions. For example, in obsessive-compulsive disorder (OCD), which typically involves intrusive thoughts that create anxiety and are followed by compulsions which function to neutralize the anxiety. Unwanted cognitions of this kind are reported to be experienced by 90%–99% of the general population (Freeston et al., 1991; Rachman & de Silva, 1978). However, only a small segment of the population (approximately 2.5%) develops symptoms of OCD, in which affected individuals respond to intrusive thoughts with ritualistic behavior to

reduce distress (APA, 2013). Models in the OCD literature suggest that compulsions result in part from an unaccepting disposition, and efforts to get rid of the intrusive thoughts lead to further distress (Eifert & Forsyth, 2005). It could be argued that patients with misophonia share the same disposition towards the sounds as those with OCD. Since the sounds are unwanted, avoided, and “pushed away,” they are more likely to be salient and distressing. This paradoxical condition is similar to the *white bear phenomenon*, or the ironic process theory of mental control, which describes the process by which attempts at thought suppression increase the frequency of the unwanted thoughts (Wegner et al., 1987). The presence of this phenomenon in association with misophonia has yet to be explored empirically, however, it does appear to play a role as it does with OCD (Abramowitz et al., 2001), as well as chronic pain (Burns et al., 2008) and tinnitus (Hesser et al., 2013). An EA-based conceptualization of misophonia was suggested by Schneider and Arch (2017) and was utilized to successfully treat a misophonia patient using an acceptance-based protocol they developed.

2.4. Theoretical model for misophonia

We will now turn to our proposed psychological model for misophonia. Prior to doing so, it may serve useful to provide a vignette of a misophonia case:

Emily, a 14-year-old high school freshman, was referred by her mother for experiencing an extreme aversion to a range of sounds including chewing, slurping, yawning, sniffing. When triggered she would experience a strong feeling of anger—at times even rage—towards the person making the sounds. These sounds were particularly triggering when a family member would emit them, with her mother and sister eliciting the strongest reactions. Emily would primarily cope by asking the triggering individual to stop making the triggering sound, leaving the room, or generally avoiding situations where the trigger might occur. The situation created tension in the household as Emily consistently asked people to stop producing the trigger sounds, which often led to arguments and verbal altercations. Emily also reported that she tended to worry about the triggers and how she would deal with situations where she would likely encounter them.

Emily was described by her mother as someone who has a tough time with change, especially changing social environments. Starting high school had been a difficult transition from middle school. She excelled in school, but tended to experience significant stress before exams and “berated” herself if she did not get a grade as high as she was expecting. Socially she tended to be people pleasing, but also had a tough time dealing with friends that did not act in accordance with her expectations. She had recently cut off a close friend whom she felt “should have been more thoughtful” when she wore t-shirt depicting a popular singer that she “can’t stand.” Emily’s father was reported to run the house like a “tight ship” and did not easily overlook mistakes or mishaps, often exhibiting frustration towards family members that violated his expected rules such as not taking food outside eating areas or failing to be punctual with time.

Emily stated that she was willing to try therapy when she realized that the triggers were “spreading” to other people outside of her family. This awareness led her to consider that her responses may not stem merely from the behavior of her family members and to acknowledge that she might play a part in the problem.

As indicated in the aforementioned literature review, rigidity appears to be associated with misophonia. In this vignette as well, Emily appears to be presenting with some symptoms of rigidity such as her expectation that her friend should follow a rule to not wear a shirt that is not agreeable to her, strict expectations of her own academic success, and difficulty with changes to her routine. Based on the possibility that rigidity and EA play an active role in the development of misophonia, the following can be proposed as a psychological model of misophonia. As suggested by Schroder et al. (2013), the presence of rigidity predisposes the development of misophonia. Rigidity leads to the rejection

of specific sound, which results in an emotional reaction of anger. This reaction serves as the initial pairing between the sound triggers and negative emotional reactivity.

Rigidity can also explain why individuals with misophonia experience a negative reaction to the behavior of *specific* individuals. It is not the sound itself that elicits their reactions but the *person* emitting the sound. Importantly, we believe that there are predisposing events that influence the negative reaction to this specific person. Being irritated or annoyed at a parent, for example, can lead one to be less tolerant of things which would otherwise not be noticed. It is entirely possible to imagine a child with perfectionistic traits who is disappointed or annoyed at one of her parents, and she became more judgmental and less tolerant of unpleasant sounds emitted by this parent. For example, in Emily’s case, she has been feeling frustrated towards her mother because she has not supported her decision to cut off her friend, she felt betrayed by her mother leaving her feeling anger towards her. Unlike someone who is more flexible, Emily relying on rigid, perfectionistic, and control-oriented strategies may not habituate to the sound, instead viewing the sound as *wrong* and not “permitting” the sound to be there.

With rigidity leading to greater awareness of the sound, the individual finds him or herself hearing a sound that is *unwanted*. To avoid the unwanted sound, he or she can either physically leave the room or attempt to ignore the sound, as exemplified in Emily’s case. This avoidance paradoxically leaves one with even greater awareness of the sound, which can lead to further distress and anger. This situation, which has been described as being “trapped” (Edelstein et al., 2013), leaves the individual in an emotional upheaval capable of creating a strong association between the person making the sound and the negative emotions. It is at this point where classical conditioning becomes relevant, in the following manner: the unconditioned stimulus is the negative interpersonal interactions with a family member (such as Emily’s mother who did not support her) which, *in combination* with rigidity, leads to unconditioned response of anger. Specifically, a family member makes a neutral sound (such as chewing) which elicits a judgement that the sound is wrong (“*why is he/she chewing so loudly?*”), which leads to a response of anger. This affective response subsequently becomes paired with otherwise neutral sounds from that person, making those sounds a conditioned stimulus, which elicits anger as a conditioned response. Once this connection has been developed, it is also reinforced through operant conditioning since the individual avoids the situations in which the specific sounds are often emitted (e.g., meal times, such as in the case with Emily) or engages in anger expression (e.g., criticism) designed to punish (and thereby control) the other person’s behavior.

Evidence suggests that thinking about the sounds, which occurs during states of hypervigilance and worry, also reinforces the association (Joos et al., 2013). Further, generalization may occur in some instances, creating associations to similar situations and other sounds. Generalization could extend to other classes of stimuli, too. Visual stimuli, for example, can be viewed as unacceptable and lead to the same reaction hypothesized with misophonia. Though they may develop from a similar process, visual stimuli seem to be less often reported as the source of distress. This may be attributable to the fact that it is easier to avert one’s gaze and avoid looking at something than it is to avoid hearing a sound. Generalization, too, can explain how the misophonia reaction can be experienced outside of the close family context. That is, the trigger itself becomes associated with aversive sensations and feelings which can be elicited by ones broader context (e.g. school, work) which can then lead to further avoidance and dysfunction. Thus, the deleterious impact of misophonia can spill over beyond the confines of the original triggering context. However, the strongest reactions to triggers still appear to consistently be reported with those from closer interpersonal relationships. This may be related to the “personal” nature of triggers; it is more hurtful when someone who is expected to be caring such as a family relative or intimate partner, as compared to those who are less likely to be held to that expectation. Further, those outside the

family context are less likely to be aware of the triggering nature of their actions which can impact the subjective level of how painful the trigger is experienced.

In summary, our model postulates that an individual with a rigid disposition may resist accepting a sound made by a person with whom there is an interpersonal conflict and will view the sound as unacceptable leading to anger should the sound recur or persist. An unaccepting disposition towards the sounds, ironically, leads to a heightened awareness of the sound. Efforts to avoid (both physical and cognitive) may provide temporary relief but also yield a hypervigilant attention to the sound, thus leaving the individual even more acutely aware of the sound's presence, and less accepting of the sounds. The more awareness there is, the more distressing it is, and thus the more it is resisted. The result is a vicious cycle as the greater awareness of distress around the sound, the more rigid one can become about the sounds (Fig. 1). An association is developed between the sounds and the negative emotion of anger, which is then maintained by negative reinforcement, and subsequently can generalize to other sounds and triggering sources (including visual stimuli) due to generalization (Fig. 2).

It should be noted that there is growing body of evidence suggesting that anxiety may play a role in the etiology of misophonia. For example, Cassiello Robins et al. (2021) found that anxiety symptoms partially mediated the relationship between symptoms of personality disorders and symptoms of misophonia. These findings are consistent with our model as it is possible that the fear of getting triggered can generate a greater effort to attempt to control and avoid the trigger which can, in turn, worsen the symptoms of misophonia. Thus, from the perspective of this model, we believe the presence of anxiety is secondary to the initial development and maintenance of the misophonia. Specifically, once the aforementioned processes are in place, the individual experiences anxiety over getting trapped in triggering situation and not having any strategies to cope. A similar example is individuals with OCD who fear getting into a situation where their fear of contamination is triggered (such as an important meeting in a restaurant) and they won't have the ability to get away from the situation to conduct a time-consuming ritual. Besides for the actual problem (OCD) there is an additional fear (impaired access to relief). So too, with misophonia, besides for the actual problem (misophonia) there is a secondary anxiety (getting trapped with triggers). Importantly, these findings relating to anxiety will have practical implications for the treatment, as we will discuss further down.

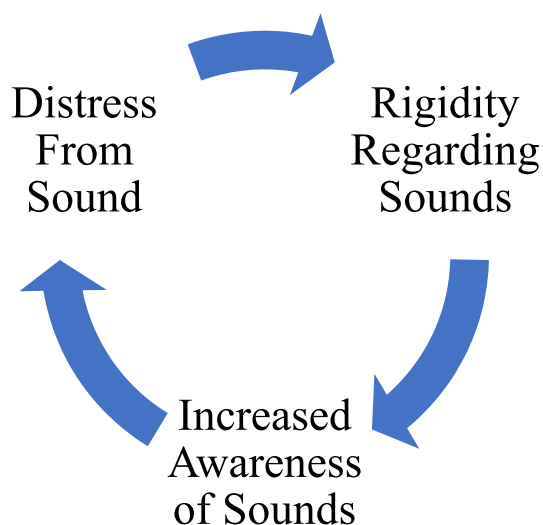


Fig. 1. Vicious cycle which contributes to the development and maintenance of misophonia.

2.5. Misophonia treatments

This conceptualization of misophonia is only relevant to the degree it can enhance the efficacy of treatment for the condition. There are several case studies that reported psychological interventions that were developed using existing therapeutic techniques, with many of them reporting reductions in misophonia symptoms (Bernstein et al., 2013; McGuire et al., 2015; Muller et al., 2018; Schneider & Arch, 2017). Almost half of 90 patients in an open trial showed significant reductions in misophonic symptoms (Schröder et al., 2017). Frank and McKay (2019) found evidence supporting the suitability for utilizing exposure strategies based on an inhibitory learning approach. The interventions in these studies primarily consisted of protocols that derived their components from cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), and dialectical behavior therapy (DBT). These components included cognitive restructuring (i.e., Bernstein et al., 2013; McGuire et al., 2015), exposure and response prevention (ERP; i.e., Frank & McKay, 2019; McGuire et al., 2015; Muller et al., 2018), counterconditioning (i.e., Dozier, 2015; Frank & McKay, 2019; Schröder et al., 2017), relaxation exercises (i.e., Schröder et al., 2017), acceptance and distress tolerance strategies (i.e., Schneider & Arch, 2017), and improving interpersonal communication skills (i.e., Bernstein et al., 2013; Muller et al., 2018). Overall, a large emphasis was placed on exposure to the sound, a treatment strategy that resembles ERP for OCD and anxiety. Indeed, some have argued that misophonia is an OCD spectrum condition (Schröder et al., 2013), suggesting that exposure-based approaches should be useful.

2.6. Treatment considerations

We believe that the structure of ERP is consistent with our proposed treatment for misophonia, though there are very significant differences between how exposures are applied to misophonia relative to OCD and its related conditions. The differences are related to the (1) interpersonal nature of misophonia and (2) the primary emotion associated with it which is consistently reported to be anger.

2.7. Interpersonal nature of misophonia

We believe that the interpersonal element present in misophonia alters the structure of the exposures in a qualitative way. In exposure-based interventions that target acceptance of something unwanted (e.g., emotion, outcome, sensation, memory), the reduction of symptoms typically follows when one ceases to resist an unwanted experience and develops a willingness to experience it, to accept it. Importantly, acceptance appears to occur when an individual realizes that their efforts to get rid of pain, anxiety or any unwanted experience is a *hopeless* endeavor, thus leaving one “cornered” with the choice of either accepting one’s experience, or further utilizing unhelpful coping strategies that are associated with dysfunction and suffering (Hayes et al., 2012). In order for acceptance to occur there must be qualitative shift in how one relates to the unwanted experiences. It requires a willingness and openness to experience the unwanted experience, and the willingness needs to be complete—it’s all or nothing (Hayes et al., 2012). If one is willing to experience the unwanted experience, acceptance can occur and symptoms often subside. For example, in OCD, intrusive thoughts are reduced when they are allowed to emerge without attempts to control or neutralize them (Craske et al., 2008). With chronic pain, too, the pain is less intrusive when attempts to get rid of the pain are ended and they are “allowed” to be there (Dahl et al., 2004).

If a goal of treating misophonia is for the patient to accept the existence of the triggering sounds and associated emotions, the path to acceptance appears different than OCD, chronic pain, and other forms of unwanted experiences. Misophonia has two core elements that make the acceptance process different: the misophonia response is perceived to be the result of (a) *someone else* making a sound who (b) *can choose to stop*

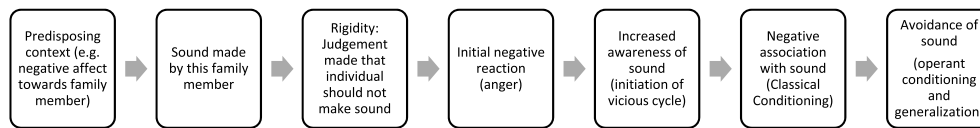


Fig. 2. Initial development of misophonia explained in terms of classical and operant conditioning.

the sound. Within this paradigm, the mere exposure and acceptance of the sounds will not be sufficient because it is not the sounds per se that are problematic but the *people* who are making them. Affected individuals can tell themselves that they are willing to accept the sounds, but in the back of their minds they may still be believing that the person making the sounds can (*and should*) stop. The fact that triggering sources can willingly end the sound poses as a challenge to acceptance. *People may be less likely to accept a situation of suffering if there is a perception that others (who are often perceived to be the cause of the suffering) are able to change their behavior and reduce the suffering.* Further, and importantly, this situation is compounded by the reality that the individual with misophonia has asked loved ones to refrain from the triggers only to find their request forgotten, ignored, or denied (as exemplified in Emily's case). Thus, misophonia patients may believe that the sounds are out of *their* control, but, importantly, they still consider the sounds to be in the volitional control of *others* (which is often *technically* true). This dichotomy can hinder the willingness to accept the sound because they may see "hope" in the disappearance of the triggering sounds by others withholding the producing of such sounds. This hope can reduce the willingness to experience the sounds and emotions, thus hindering the acceptance process. Hence, one of the aims of misophonia treatment is to help the patient accept the sounds as an unchangeable phenomenon in their life despite the reality that others can technically control the triggers from occurring. Additionally, this hope that others may refrain from the triggers may make the individual feel that they themselves may have some control over the trigger in situations where they do have some interpersonal influence over the source of the sound which can make this unhelpful form of hope even stronger.

2.8. Salience of anger in misophonia

A second difference between the application of ERP for OCD versus misophonia is related to the salience of anger in the misophonic response. In order to treat misophonia it is imperative to work towards understanding this emotion so it can be properly addressed. Anger is often described as an emotion which emerges in reaction to a perceived injustice or unfair treatment (Berkowitz, 1990). For example, when patients with misophonia perceive that making chewing sounds is invasive and disgusting (Edelstein et al., 2013), it elicits the emotion of anger as these perceptions suggest that the situation is wrong, unfair, and unjust. The emotion is sustained so long that the individual perceives the situation is wrong and should be changed. If in OCD the therapeutic process is focused in engendering a framework where the sufferer can learn to accept and be open to unwanted future outcomes, then here the work is different in that the focus is accepting an unwanted situation that is already present. The temporal element greatly shifts the focus in qualitative way, such what is being accepting is an unwanted reality that is very unlikely to change. When an individual "come to terms" with a reality and refrains from working to change it, anger subsides. How one comes accepts this reality will be the focus of the proposed therapy.

Taking into consideration anger and the interpersonal nature of the condition, we will now turn to suggest a treatment approach that flows from our psychological model for misophonia. In the following section we will offer a description and rationale of our treatment framework for misophonia which we have termed experiential acceptance and stimulus engagement (EASE).

3. A misophonia treatment framework: experiential acceptance and stimulus engagement

In this section we aim to outline a general framework for psychotherapy tailored for the treatment of misophonia. The goal here is to provide the parameters and basic core components for a treatment which we believe can be effective, and thus warrant future research. EASE is currently not meant to serve as a formal treatment protocol or manual.

The core goal of EASE for misophonia is to address the maintaining factors of the condition, which we have postulated to be rigidity and avoidance. As per our model, rigidity contributes to a resistant disposition toward the sounds, which leaves the individual with greater cued awareness of the sounds. This heightened awareness, in turn, generates even greater resistance to the sounds, thus contributing to a negative cycle. Cultivating flexibility and openness, which can thereby lead to acceptance, will be the ultimate aim of the treatment. In other words, the aim of the therapy is to address the conditions that give rise to rigidity in order to develop flexibility by using the following three components: (1) ending toxic hope, (2) eliminating avoidance and control strategies, and (3) engagement in situations with triggering stimuli. In addition to these components, the intervention begins with psychoeducation about misophonia, an outline of the treatment model, and a review of the rationale for the treatment. In the following sections we will describe each component of EASE.

3.1. Ending toxic hope

As discussed earlier, when someone perceives that they are the victim of an injustice, the associated emotion is anger. People generally do not readily permit and allow themselves to be the subject of an injustice and it follows that they will struggle to end the unjust conditions. However, if a person does not believe that the situation can be changed, despite that it is unjust, there will likely not be a struggle as the mere behaviors to change the situation are hopeless. Embedded within the rigidly held view that others should not make aversive sounds is the *hope* that the sounds and thus the distress will somehow end. The aim of this step is to end the hope that the sounds will end; one will likely not place hope in a possibility that has zero chances of occurring. Inversely, it is very likely that this hope is what fuels efforts to eliminate the triggers (e.g., punishing those who emit the sounds, avoiding meal-times). Moreover, akin to hoping for something that is outside the realm of likelihood (such as the spontaneous resurrection of a deceased pet), the mere hope itself is unhelpful, if not dysfunctional. This form of hope we label "toxic hope." We believe that toxic hope leaves a person feeling that they may have some power to end the triggers in their life, despite the enduring reality suggesting otherwise. It is then crucial to directly address this feeling by cultivating, willingly, a powerlessness in the face of the triggers. This disposition powerlessness is necessary for the qualitatively reducing other forms of control that in turn maintain misophonia. When the individual knows there are no options and feels powerless, he or she can accept the unavoidable reality of the triggers: there are no options left. When this happens, the reaction of anger should be less intense. Unavoidable experiences are less likely to be construed as injustices than events over which people can exercise control.

The idea of simply letting go and not trying to do something about the triggers can be viewed as somewhat perplexing and even

unacceptable in the sense that one is not protecting themselves from harm. In this regard, it useful to use a metaphor called “playing dead,” which describes how to survive being attacked by a grizzly bear. The practice involves simply lying on the floor and “playing dead.” While this is a very counterintuitive response, it also is the most functional one. Similarly, in misophonia, the goal is to resist the instinctual response to “do something” and instead “do nothing.” By choosing “non-doing” and expecting the trigger to stay the same, the individual can then learn to accept the presence of the trigger.

This step can be enhanced through usage of an imaginal technique we termed “the victorious surrender.” This latter point involves imaging oneself with a trigger and coming up with all the ways the individual will try to escape the situation. The therapist guides the individual to “give up” each one of those strategies until they are left with nothing. Also addressed is the mere feeling of “hope” that they can do something about the trigger sound. Specifically, patients are asked to imagine themselves as completely powerless. This allows the individual to see what it looks like to be powerless in the face of the trigger, which is ultimately the ideal therapeutic position to be in since having “surrendered” one need no longer focus on the sound, thus termed “victorious surrender.” In addition to learning about choosing to let go of forms of behavior that give one the illusion of control, this exercise is also helpful for identifying all the different forms of avoidance.

Another important element of this step is discussing the fact the view that *others* can technically stop making the triggering sounds, which can erroneously lead one to feel that there is hope in that possibility – a hope that can undermine willingness to let go of control strategies. This interpersonal nuance is very important to address and, indeed, may be one of the most challenging steps in the process of acceptance. To address this, it is important to shift the discussion away from the moral certitude regarding who is responsible for changing behavior (i.e., “who is right”) since this will likely lead to a futile discussion that will leave the patient defensive about rigidly held personal views. Importantly, it is useful to affirm the patient’s position that the sounds *feel* wrong. From the perspective of the misophonia sufferer, it feels like the world is perpetrating an ongoing injustice against him or her. The choice thus presents itself: trying to do something about the triggers (as informed by toxic hope and the control strategies) or stop doing something about and come to terms with the reality that he or she lives in a world where people *could* technically end the misery created by the sounds yet are unlikely to do so. *Acceptance emerges as a natural consequence when the individual stops struggling against their reality despite that fact that it feels unjust.* This is a choice that is available to the misophonia sufferer. In order to make this step easier for the patient, it is important for the therapist to be very validating of the difficult interpersonal feelings that arise in a situation where people—loved ones—continue create painful triggers despite many requests to stop.

3.2. Reduction of avoidance

Once the individual with misophonia is willing to stop trying to avoid the unwanted sounds, it is important to identify and address all the various forms of avoidance. We have identified three main categories of avoidance behaviors: physical avoidance, cognitive avoidance, and altering others’ behavior.

Physical avoidance. This includes physically removing oneself from the vicinity of sounds, such as leaving the dinner table and eating alone (Schroder et al., 2013), reducing the audiological perception of the sound by wearing sound-cancelling headphones, and utilizing white-noise to wash-out sounds (Schroder et al., 2013). Further, some have reported mimicking the triggering sounds with the goal to “cancel” out the sound (Edelstein et al., 2013).

Cognitive avoidance. This involves any attempt to utilize one’s cognitive capacities to reduce the perception of the sound. For example, attempting to shift the attention to a different sound or trying to ignore the sounds (Edelstein et al., 2013). Another form is trying to “reframe”

the sounds as something other than it is to make it less aversive. For example, imagining the crunching sound as someone grinding rocks instead of eating.

Avoidance by altering others’ behavior. This involves asking the individuals making the sounds to alter their behavior in an effort to reduce the sound, such as refraining from making the sound or having them leave the room (Edelstein et al., 2013). Others methods include non-verbal communication such as “glaring” at them.

3.3. Stimulus engagement

Once toxic hope and control strategies have been identified, the goal is to end utilization of avoidant strategies to allow for proactive engagement with the triggering stimuli, akin to exposures. This can be conducted in several way, both in and out of session. This will likely require creativity as each person with misophonia have their own unique triggers. In session the most accessible form of engagement with the stimulus through the imaginal medium. Other options include bringing “triggering” individuals into session and/or listening and watching to recordings of triggers. Additionally, a hierarchy may be used in planning these exercises as there are subjective differences between the levels of distress that triggers can elicit for each individual (Frank & McKay, 2019).

It should be noted that one potential obstacle to the engagements is the anxiety of letting go of control of their unhelpful coping strategies due to a variety of worries or fears. For example, a patient may avoid engaging with the triggering sounds as they are afraid they will never enjoy life again (“if I allow others to make sounds I will always be miserable.”) Another concern might be related to a fear of losing control and acting out on an aggressive impulse (“if I just let the sound occur, I might hurt someone out of rage.”). Whatever the fear may be, we would recommend an acceptance-based approach involving acceptance of the unwanted outcome as possible (akin to ERP) as opposed to a cognitive restructuring approach (e.g., examining the evidence). The aim here is for a “wraparound” acceptance of all unwanted experiences and possible outcomes.

3.4. Vignette: treatment with EASE

We will now present a vignette of applying EASE utilizing the aforementioned vignette of Emily.

Session 1. The first session was conducted with Emily and her mother. In addition to collecting standard intake information, the focus of this session was to collect data regarding Emily’s current forms of avoidance and coping. This information will be used towards eliminating avoidance.

Session 2. The second session focused on psychoeducation about the psychological model of misophonia and EASE. A particular emphasis was placed on the discussion of toxic hope, and used the “playing dead” metaphor to discuss the topic of letting go of control strategies and avoidance. Also practiced the “victorious surrender” exercise to help with making the experience of letting go more relatable and understandable.

Homework: Collaboratively identify areas to start reducing physical avoidance and engaging in triggering situations for a longer period of time than usual without engaging in any form of control, including cognitive and behavioral strategies to avoid experience. Emily chose to join the family for dinner for 5 min every day. Also, she agreed to practice twice a day the “victorious surrender” exercise to get used the philosophy of the therapy.

Session 3. The third session began with reviewing the week. Emily shared that she followed through on most days, but noted some days when she was stressed, it was “too much.” Emily shared that most days were “difficult” but “tolerable” and that at times she even stayed at the dinner table for longer than 5 min. Emily stated that she particularly struggled with triggers that occurred outside of mealtime because they

were “unexpected.” Based on this, Emily practiced engaging with the unexpected triggers utilizing an imaginal scene involving her sister slurping a drink behind her in the living room as she was reading a book and chose to not avoid the trigger, instead utilizing the “victorious surrender” approach to practice accepting the trigger.

Homework: Practice engaging triggers imaginably 3 times a day for 5 min. In collaboration with her therapist, Emily agreed to expand the time at dinner to 10 min every night and also to watch television with her family for 10 min each evening – all while not engaging in any avoidant strategies.

Session 4–12. These sessions review homework and engage in troubleshooting for any issues that might arise. Each session includes exercises practicing engagement with triggers without resorting in any form of avoidance or toxic hope.

Homework: After each session, homework assignments continued to emphasize practice of stimulus engagement, with Emily gradually increasing the amount of time spent in family situations without using avoidant strategies.

3.5. Limitations and future research

There are several limitations to the model and therapy formulations presented in this paper. Firstly, this paper is based on theory and has not yet been subject to empirical testing. Another limitation is that our model heavily relies on the research measuring personality traits and disorders, which generally have proven difficult to measure with reliability. We believe that future research should examine efficacy of our proposed treatment called EASE. Specifically, we believe the following hypothesis should be examined: (1) EASE will lead to a significant reduction of symptoms of awareness of triggering sounds, (2) EASE will lead to decreased level of distress when sounds are heard, and (3) EASE will lead to increased levels of functioning.

4. Conclusion

Misophonia is a debilitating condition which has recently gained attention that, to our knowledge, lacks a comprehensive psychological model. To this end, this paper sought to develop one grounded in the current published research. Based on the consistent findings that a majority of individuals with misophonia report traits of rigidity, we developed an etiological model explaining its symptoms. This model suggested that traits of rigidity combined with classical conditioning, operant conditioning, and generalization, play a role in the development and maintenance of misophonic symptoms. Flowing from the model, we concluded with a proposed treatment, EASE, an acceptance-based protocol that consists of ending toxic hope, reducing avoidance, and stimulus engagement.

Declarations of interests

None.

Author statement

We declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere.

Declaration of competing interest

☑ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Abramowitz, J. S., Tolin, D. F., & Street, G. P. (2001). Paradoxical effects of thought suppression: A meta-analysis of controlled studies. *Clinical Psychology Review*, 21(5), 683–703. [https://doi.org/10.1016/s0272-7358\(00\)00057-x](https://doi.org/10.1016/s0272-7358(00)00057-x)
- American Psychiatric Association. (2013). In *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Publishing.
- Berkowitz, L. (1990). On the formation and regulation of anger and aggression: A cognitive-neoassociationistic analysis. *American Psychologist*, 45(4), 494.
- Bernstein, R. E., Angell, K. L., & Dehle, C. M. (2013). A brief course of cognitive behavioural therapy for the treatment of misophonia: A case example. *The Cognitive Behaviour Therapist*, 6, 10. <https://doi.org/10.1017/s1754470x13000172>
- Burns, J. W., Quartana, P., Gilliam, W., Gray, E., Matsuura, J., Nappi, C., & Lofland, K. (2008). Effects of anger suppression on pain severity and pain behaviors among chronic pain patients: Evaluation of an ironic process model. *Health Psychology*, 27(5), 645. <https://doi.org/10.1037/a0013044>
- Cassello-Robbins, C., Anand, D., McMahon, K., Brout, J., Kelley, L., & Rosenthal, M. Z. (2021). A preliminary investigation of the association between misophonia and symptoms of psychopathology and personality disorders. *Frontiers in Psychology*, 11, 3842. <https://doi.org/10.3389/fpsyg.2020.519681>
- Cavanna, A. E., & Seri, S. (2015). Misophonia: Current perspectives. *Neuropsychiatric Disease and Treatment*, 11, 2117. <https://doi.org/10.2147/ndt.s81438>
- Chawla, N., & Ostafin, B. (2007). Experiential avoidance as a functional dimensional approach to psychopathology: An empirical review. *Journal of Clinical Psychology*, 63(9), 871–890. <https://doi.org/10.1002/jclp.20400>
- Craske, M. G., Kircanski, K., Zelikowsky, M., Mystkowski, J., Chowdhury, N., & Baker, A. (2008). Optimizing inhibitory learning during exposure therapy. *Behaviour Research and Therapy*, 46(1), 5–27. <https://doi.org/10.1016/j.brat.2007.10.003>
- Dahl, J., Wilson, K. G., & Nilsson, A. (2004). Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial. *Behavior Therapy*, 35(4), 785–801. [https://doi.org/10.1016/S0005-7894\(04\)80020-0](https://doi.org/10.1016/S0005-7894(04)80020-0)
- Dozier, T. H. (2015). Counterconditioning treatment for misophonia. *Clinical Case Studies*, 14(5), 374–387. <https://doi.org/10.1177/1534650114566924>
- Dozier, T. H., Lopez, M., & Pearson, C. (2017). Proposed diagnostic criteria for misophonia: A multisensory conditioned aversive reflex disorder. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.01975>
- Edelstein, M., Brang, D., Rouw, R., & Ramachandran, V. S. (2013). Misophonia: Physiological investigations and case descriptions. *Frontiers in Human Neuroscience*, 7, 296. <https://doi.org/10.3389/fnhum.2013.00296>
- Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance and commitment therapy for anxiety disorders: A practitioner's treatment guide to using mindfulness, acceptance, and values-based behavior change*. Oakland, CA: New Harbinger.
- Frank, B., & McKay, D. (2019). The suitability of an inhibitory learning approach in exposure when habituation fails: A clinical application to misophonia. *Cognitive and Behavioral Practice*, 26(1), 130–142. <https://doi.org/10.1016/j.cbpra.2018.04.003>
- Freeston, M. H., Ladouceur, R., Thibodeau, N., & Gagnon, F. (1991). Cognitive intrusions in a non-clinical population. I. Response style, subjective experience, and appraisal. *Behaviour Research and Therapy*, 29(6), 585–597. [https://doi.org/10.1016/0005-7967\(91\)90008-q](https://doi.org/10.1016/0005-7967(91)90008-q)
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14(5), 449–468.
- Gallagher, N. G., South, S. C., & Oltmanns, T. F. (2003). Attentional coping style in obsessive-compulsive personality disorder: A test of the intolerance of uncertainty hypothesis. *Personality and Individual Differences*, 34(1), 41–57. [https://doi.org/10.1016/S0191-8869\(02\)00025-9](https://doi.org/10.1016/S0191-8869(02)00025-9)
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (2012). *Acceptance and commitment therapy: An experiential approach to behavior change* (New York).
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64(6), 1152. <https://doi.org/10.1037/0022-006X.64.6.1152>
- Hesser, H., Molander, P., Jungermann, M., & Andersson, G. (2013). Costs of suppressing emotional sound and counter-effects of a mindfulness induction: An experimental analog of tinnitus impact. *PLoS One*, 8(5), Article e64540.
- Hocaoglu, C. (2018). A little known topic misophonia: Two case reports. *The Journal of Psychiatry and Neurological Sciences*, 31, 89–96. <https://doi.org/10.5350/dajpn2018310109>
- Jager, I., de Koning, P., Bost, T., Denys, D., & Vulink, N. (2020). Misophonia: Phenomenology, comorbidity and demographics in a large sample. *PLoS One*, 15(4), Article e0231390. <https://doi.org/10.1371/journal.pone.0231390>
- Jastreboff, M. M., & Jastreboff, P. J. (2002). Decreased sound tolerance and tinnitus retraining therapy (TRT). *Australian and New Zealand Journal of Audiology*, 24(2), 74–84. <https://doi.org/10.1375/audi.24.2.74.31105>
- Jastreboff, P. J., & Jastreboff, M. M. (2014). Treatments for decreased sound tolerance (hyperacusis and misophonia). *Seminars in Hearing*, 35(2), 105–120. <https://doi.org/10.1055/s-0034-1372527>
- Johnson, P. L., Webber, T. A., Wu, M. S., Lewin, A. B., Murphy, T. K., & Storch, E. A. (2013). When selective audiovisual stimuli become unbearable: A case series on pediatric misophonia. *Neuropsychiatry*, 3(6), 569–575. <https://doi.org/10.2217/npv.13.70>
- Joos, E., Vansteenwegen, D., Vervliet, B., & Hermans, D. (2013). Repeated activation of a CS-US-contingency memory results in sustained conditioned responding. *Frontiers in Psychology*, 4, 305. <https://doi.org/10.3389/fpsyg.2013.00305>

- Kluckow, H., Telfer, J., & Abraham, S. (2014). Should we screen for misophonia in patients with eating disorders? A report of three cases. *International Journal of Eating Disorders*, 47(5), 558–561. <https://doi.org/10.1002/eat.22245>
- Kumar, S., Tansley-Hancock, O., Sedley, W., Winston, J. S., Callaghan, M. F., Allen, M., Cope, T. E., Gander, P. E., Bamiou, D.-E., & Griffiths, T. D. (2017). The brain basis for misophonia. *Current Biology*, 27(4), 527–533.
- McGuire, J. F., Wu, M. S., & Storch, E. A. (2015). Cognitive-behavioral therapy for 2 youths with misophonia. *Journal of Clinical Psychiatry*, 76(5), 573–574. <https://doi.org/10.4088/jcp.14cr09343>
- McKay, D., Kim, S. K., Mancusi, L., Storch, E. A., & Spankovich, C. (2018). Profile analysis of psychological symptoms associated with misophonia: A community sample. *Behavior Therapy*, 49(2), 286–294. <https://doi.org/10.1016/j.beth.2017.07.002>
- Muller, D., Khemlani-Patel, S., & Neziroglu, F. (2018). Cognitive-behavioral therapy for an adolescent female presenting with misophonia: A case example. *Clinical Case Studies*, 17(4), 249–258. <https://doi.org/10.1177/1534650118782650>
- Natalini, E., Dimaggio, G., Varakliotis, T., Fioretti, A., & Eibenstein, A. (2019). Misophonia, maladaptive schemas and personality disorders: A report of three cases. *Journal of Contemporary Psychotherapy*, 1–7. <https://doi.org/10.1007/s10879-019-09438-3>
- Naylor, J., Caimino, C., Scutt, P., Hoare, D. J., & Baguley, D. M. (2020). The prevalence and severity of misophonia in a UK undergraduate medical student population and validation of the amsterdam misophonia scale. *Psychiatric Quarterly*, 1–11. <https://doi.org/10.1007/s11126-020-09825-3>
- Neal, M., & Cavanna, A. E. (2013). Selective sound sensitivity syndrome (misophonia) in a patient with Tourette syndrome. *Journal of Neuropsychiatry and Clinical Neurosciences*, 25(1), E01. <https://doi.org/10.1176/appi.neuropsych.11100235>
- Palumbo, D. B., Alsaman, O., De Ridder, D., Song, J. J., & Vanneste, S. (2018). Misophonia and potential underlying mechanisms: A perspective. *Frontiers in Psychology*, 9, 953. <https://doi.org/10.3389/fpsyg.2018.00953>
- Pinto, A. (2016). Treatment of obsessive-compulsive personality disorder. In E. A. Storch, & A. B. Lewin (Eds.), *Clinical handbook of obsessive-compulsive and related disorders: A case-based approach to treating pediatric populations* (pp. 415–429). New York, NY: Springer.
- Pollak, J. (1987). Obsessive-compulsive personality: Theoretical and clinical perspectives and recent research findings. *Journal of Personality Disorders*, 1(3), 248–262. <https://doi.org/10.1521/pedi.1987.1.3.248>
- Rachman, S., & de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy*, 16(4), 233–248. [https://doi.org/10.1016/0005-7967\(78\)90022-0](https://doi.org/10.1016/0005-7967(78)90022-0)
- Rouw, R., & Erfanian, M. (2018). A large-scale study of misophonia. *Journal of Clinical Psychology*, 74(3), 453–479. <https://doi.org/10.1002/jclp.22500>
- Schneider, R. L., & Arch, J. J. (2017). Case study: A novel application of mindfulness- and acceptance-based components to treat misophonia. *Journal of Contextual Behavioral Science*, 6(2), 221–225. <https://doi.org/10.1016/j.jcbs.2017.04.003>
- Schröder, A., Vulink, N., & Denys, D. (2013). Misophonia: Diagnostic criteria for a new psychiatric disorder. *PLoS One*, 8(1), Article e54706. <https://doi.org/10.1371/journal.pone.0054706>
- Schröder, A. E., Vulink, N. C., van Loon, A. J., & Denys, D. A. (2017). Cognitive behavioral therapy is effective in misophonia: An open trial. *Journal of Affective Disorders*, 217, 289–294. <https://doi.org/10.1016/j.jad.2017.04.017>
- Schwartz, P., Leyendecker, J., & Conlon, M. (2011). Hyperacusis and misophonia: The lesser-known siblings of tinnitus. *Minnesota Medicine*, 94(11), 42–43.
- Taylor, S. (2017). Misophonia: A new mental disorder? *Medical Hypotheses*, 103, 109–117. <https://doi.org/10.1016/j.mehy.2017.05.003>
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, 53(1), 5. <https://doi.org/10.1037/0022-3514.53.1.5>
- Wu, M. S., Lewin, A. B., Murphy, T. K., & Storch, E. A. (2014). Misophonia: Incidence, phenomenology, and clinical correlates in an undergraduate student sample. *Journal of Clinical Psychology*, 70(10), 994–1007. <https://doi.org/10.1002/jclp.22098>