Misophonia or Auditory Over-Responsivity

An Information Packet For
Medical Professionals, Researchers, and Interested Professionals

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What is Misophonia?

The term Misophonia, which literally means "hatred of sound," was first coined by Jastreboff and Jastreboff (2001). Jastreboff & Jastreboff (2001) coined the term misophonia as they distinguished these patients from those with hyperacusis. Hyperacusis patients aversely react to noises perceived as loud, whereas misophonics react to "repetitive or pattern based noises" regardless of decibel level (Jastreboff & Jastreboff, 2014).

According to the Jastreboff's both conditions are subsumed under "Decreased Sound Tolerance" and both conditions relate to "aberrant" associations between the auditory and the limbic system. However, in Misophonia, auditory triggers include slurping, lip smacking, breathing, and chewing versus perceived loud noises, as in hyperacusis. Because these patterned based noises are often associated with a person and/or not related to intensity, the Jastreboff's (2014) hypothesized that in Misophonia, these aversive responses were "learned" or "cognitively mediated." That is, in misophonia, there is a negative cognitive association that has been paired with auditory stimuli that goes beyond a "subconscious" association between the auditory cortex and limbic system (as in hyperacusis).

The learned versus inborn nature of the aversive reactivity still of debate. However, newer research (along with research in similar disorders) supports as the Jastreboff's suggested, that when a person with misophonia hears a sound that they interpret as noxious, autonomic arousal occurs and fight/flight is often activated.

To date, Misophonia has mostly garnered attention from researchers in audiology, Obsessive Compulsive and Related Disorders, Anxiety, and Synesthesia.
In audiology, research both addresses similarities and distinctions between Hyperacusis

and Misophonia. In psychology, commonalities between Obsessive Compulsive and Related Disorders and anxiety are currently being investigated. In neuroscience, models of misophonia as a form of synesthesia are proposed. Across this research is also discussion of "general sensory sensitivities," "sensory-defensiveness" and "multisensory processing" (e.g. Wu, Lewin, Murphy, & Storch, 2014).

In regard to Sensory-Defensiveness it is also important to note that there is a remarkable overlap in Misophonia symptoms and Sensory Over-Responsivity (SOR), a subtype of Sensory Processing Disorder (SPD). Notably, the research in SOR has been related mainly to children, although currently it addressing adults. While SOR research concerns a variety of sensory stimuli, it is important to note that within these groups were children known as mainly "auditory over-responsive."

There are numerous papers that separate out auditory over-responsive symptoms, as well as studies focused specifically on auditory gating (e.g. Gavin, W. J., Dotseth, A., Roush, K. K., Smith, C. A., Spain, H. D., & Davies, P. L., 2011). SPD/SOR research, even that which was specific to the auditory modality, did not differentiate between loud and repetitive sounds. This makes it difficult to extrapolate

from SOR to Misophonia. However, the overlap in behavioral symptoms in regard to "auditory over-responsivity" is remarkable.
The research in Misophonia is in its infancy. However, reviewing bodies of research across disciplines such as audiology, occupational therapy, neuroscience and psychology will add to the basis for an understanding of this condition, and can inform the next steps for research.
This is of great importance, as those who suffer with Misophonia report levels of impaired functioning ranging from moderate to severe across multiple life areas. Some sufferers even report withdrawal from numerous activities and social isolation as a result of the disorder.

What is The Over-Lap Between Misophonia and SPD SOR?

Misophonia may be related to SPD SOR. An impressive body of research supports that particular groups of young children misperceive auditory, visual, tactile, and other stimuli as highly aversive and dangerous. Notably, the research in Sensor Over Responsivity (SOR) has been related mainly to children, although currently it is beginning to address adults as well. While SOR research concerns a variety of sensory stimuli, it is important to note that within these groups were children known as mainly "auditory over-responsive."

As far back as 1999 studies of children considered SOR demonstrated autonomic arousal and decreased habituation. Using Electro Dermal Reactivity (EDR), children were presented with every day sensory stimuli and their responses were measured by galvanic skin responses. Many children with SOR exhibited increased amplitude, frequency, and reduced habituation to sensory stimulation (e.g. McIntosh, Miller, Shyu, & Hagerman, 1999; James, Miller, Schaff, Neilsen, & Schoen, 2011). In other words, children who were over-responsive to both auditory and other sensory stimuli demonstrated autonomic arousal (to the extent of "fight/flight"), as well as decreased habituation. Decreased habituation means that the part of the nervous system that puts the "brakes" on fight/flight do not work efficiently for these children. Occupational Therapy Sensory Integration Methods are utilized to "bring in the

parasympathetic nervous system and help put the brakes on "fight/flight". Occupational Therapists with the right training know how to help an over-responsive individual utilize exercises that will activate the parasympathetic nervous system, thus putting the brakes on fight/flight. This has always been one of the most important coping tools for "auditory over-responsive" children and adults and can be employed successfully for those with Misophonia as well.

Studies on auditory gating, in which individuals across many different health and psychiatric disorders, have noted that many individuals respond to repetitious stimuli (both loud and soft regarding amplitude) as though it were dangerous. This sets off autonomic arousal, often leading to the fight/flight response. Once in flight/flight individuals who have been noted to over-respond to both loud and soft sounds do not habituate. That is, the parasympathetic nervous system (which puts the brakes on fight/flight) does not operate efficiently. Thus, people with misophonia probably have both an exaggerated response to specific sounds as well as an inability to calm down.

Is There a Treatment?

WITH M. ZACHARY ROSENTHAL, PH.D. (DUKE UNIVERSITY)

There are no single specific behavioral or device-based treatments that have been rigorously tested scientifically and shown to efficaciously treat Misophonia. At this point, there only are early small scale uncontrolled and pilot studies that have not yielded definitive results. Accordingly, patients seeking services for Misophonia are encouraged to ask treatment providers to disclose (a) which interventions will be used to help treat Misophonia, (b) the rationale for such approaches in light of available scientific evidence, and (c) any potential risks a particular treatment may pose.

There is no FDA approved medication for Misophonia. There is no scientific evidence that any specific medication treats Misophonia. However, doctors may want to prescribe medications "off label". If a doctor prescribes medications for Misophonia, we believe it is appropriate that patients be aware that such medications are experimental. In such circumstances, we suggest doctors disclose (a) the clear rationale for the use of such medications and (b) any possible side effects and risks.

When Considering Treatment, the best approach for patients is an evaluation using a multi-disciplinary approach. This would include evaluations from licensed providers who can begin by assessing underlying biological impairments (e.g., neurologists) and behavioral problems (e.g., psychologists, occupational therapists). Following assessment, these professionals can work together to provide a multi-disciplinary and personalized treatment approach. While this approach is not always available, keep in mind that it is always best to rule out any medical conditions if you have had any changes in regard to your auditory (or visual) functioning or general health.

Primary care physicians should rule out any possible health issues that may be causal or contributory to symptoms. This may involve sending patients for testing by an audiologist or neurologist.

With regard to other treatment providers, patients should go to professionals who are familiar with the current research, and are not committed to a particular therapy, but are instead are willing to consult with other clinicians to build an individualized coping skills program for the patient, and guide you with respect to any treatments you may want to try (again providing you with reliable information on the efficacy and risk of each treatment). There are less than 30 studies that directly evaluate Misophonia: Research, Articles and Press.

Much of the existing research has not interpreted individual findings on Misophonia to important and related basic and applied research across disciplines. As such, we believe a more comprehensive approach to the study of Misophonia is needed that includes researchers, methods, and measures used across fields (e.g., occupational therapy, audiology, neurology, psychiatry, psychology, cognitive neuroscience, neurobiology). A multi-disciplinary approach to research has the promise to offer insights about the causes and treatments for this condition.

What Options Exist For Patients?

Audiologists

An Audiologist with proper training may help by evaluating if a patient has Misophonia, although there is no approved "test" for Misophonia yet and it is not in any diagnostic manual. Audiologists may provide patients with earplugs that have been personally fitted. These may or may not generate non-offending noise to mask the noises that bother a patient.

Psychologists

Some cognitive psychologists feel that Misophonia should be classified under Obsessive Compulsive and Related Disorders (previously termed "OCD" in the DSM-IV-TR) in the DSM-5. While there may be neurological and behavioral overlaps, there is no compelling evidence that this overlap exists, or that OCD treatment will help patients. Psychologists may help a patient by helping them to find coping mechanisms that lessen the impact of triggers.

Psychiatrists

Psychiatrists can prescribe medication to treat symptoms and conditions that may accompany the condition (such as anxiety, insomnia, feelings of rage/fear/depression, etc.). However, there are no medications that have been tested or considered for the disorder.

Neurologists

Anyone who has sudden onset of any changes in mood or sensory perception, should see a neurologist to rule out other disorders. While there is no current cure or diagnosis for Misophonia it is important that patients suffering from these symptoms are properly evaluated and not simply passed-off as having "anxiety issues".

Occupational Therapists

An OT (Occupational Therapist) may be beneficial for sufferers of sensory over-load. Many OTs have been trained to understand SPD (Sensory Processing Disorder) and understand techniques to help children, teens, and even adults with the disorder. While OTs do not cure sensory conditions they are invaluable in helping patients to cope and live a relatively normal life.

Current Research and the IMRN

Founded by Dr. Jennifer Jo Brout, The IMRN (International Misophonia Research Network) consists of sufferers and doctors working together to support science that leads to treatment and better practice standards for misophonia. The IMRN facilitates research through crowd sourcing and other funding strategies. We are in the trenches with you and together we will make the research happen. We do not accept any donations ourselves, we fundraise for researchers we choose. The IMRN features four research initiatives to help further knowledge on Misophonia and other disorders related to auditory over-responsivity.

These programs are at the SPD Foundation, Duke University (The Sensory Processing and Emotion Regulation Program), NYU (LeDoux Lab), as well as the study by Stephen Porges. The IMRN provides Quality Control through Learning and Resources

We provide accurate information so that those impacted by the disorder can make informed decisions about therapy and products. The IMRN will always be behind sufferers when they are in need of advocacy in school or at work. The IMRN stands behind research and treatment of proven value and we stand against that which is not.

SPD Foundation

For the purpose of Misophonia, Dr. Brout and Dr. Miller are working on a short-term program that can be individualized and taught to adults in order to help them "down-regulate" (or bring in the parasympathetic nervous system). This is something that Dr. Brout has utilized for herself and for her daughter since learning about OT SI Therapy in 1999. However, not everyone can see an Occupational Therapist or strategize how to work these exercises into every day life. Currently, Dr. Miller and Dr. Brout are working on a delivery method that is inexpensive and widely available. In addition, Dr. Miller and IMRN are refining a study that will help determine if SPD "auditory over-responsivity" and Misophonia do in fact include the same symptoms, and/or how they may differ, etc.

NYU - LeDoux Lab

The LeDoux lab is currently working on a study that is influenced by Misophonia. The goal of this research is to explore how the processing of auditory stimuli in the brain can go awry (leading some people have aversive reactions to stimuli that most people consider innocuous).

To gain a better understanding of how these averse reactions are controlled by the brain, we are building on our research over the past 30 years. We have shown that the brain region called the amygdala is key to such responses. One area of the amygdala, the lateral nucleus, is involved in receiving sensory inputs and another, the central nucleus, controls the expression of responses. Over-reactivity to auditory stimuli could be due to a hypersensitive lateral amygdala or an over-reactive central amygdala.

We will study animals that show exaggerated responses to auditory stimuli and will record activity in the lateral or central nucleus to try to determine whether the problem is due to hyper-sensitivity or hyper-reactivity.

If results are promising, we could pursue brain imaging studies in humans, to try to confirm that these results apply to humans as well, helping us to discover ways to treat the problem.

Duke University

The Sensory Processing and Emotion Regulation Program is the longest standing research program involved with the IMRN. Founded by Jennifer Jo Brout in 2008 and led by Dr. Zach Rosenthal.

Previous studies from this program have examined the effects of meclizine on pre-pulse inhibition (Levin et al., 2014) and the relationship between sensory over-responsivity and emotions in adult psychopathology (Rosenthal et al., 2011; Rosenthal et al., in press).

In addition to research, we are dedicated to developing, evaluating, and establishing best practices for providers working with patients who report having the disorder. The approach we are developing is multi-disciplinary and is done in tandem with patients and their families.

The self-help component to this approach is a practical combination of proactive coping skills designed to help individuals identify aversive stimuli, and learn different ways to help calm the physiological and emotional over-arousal associated with that stimuli. The program also seeks to help individuals re-evaluate and change ways of thinking about aversive stimuli that may act to acerbate. The program teaches how to help calm the physiological and emotional responses to these adversive stimuli.

> “We only work with researchers we trust, who take us seriously and who care about us as individuals.

Stephen Porges

The Polyvagal Theory proposes that subjective responses to sounds are initially (before associative learning) based on two features of the acoustic signal: pitch and variation in pitch. The theory articulates that for mammals there is a frequency band of perceptual advantage in which social communication occurs. It is within this frequency band that acoustic “safety” cues are conveyed.

Consistent with the theory, safety is signaled when the pitch of the acoustic signal is modulated within this band. Thus, a monotone within this band is not sufficient to signal safety. Moreover, the theory proposes that low frequency monotone sounds (e.g., dog’s bark, lion’s roar, large truck, and thunder) are inherent signals of predator and high frequency monotone sounds are inherent signals of pain and danger (e.g., shrill cries of babies or someone who is being injured).

The goal is to provide an acoustic model of stimuli that subjectively trigger defense (predator, danger) or safety and calmness. A secondary goal is illustrate that the affective dimensions of valence and arousal can be translated into acoustic features that have a neurophysiological substrate and a phylogenetic history.

We will provide an explanation of why sounds are perceived as pleasing and calming and why other sounds are frightening or signal danger. The explanation will be based on how our nervous system processes and categorizes acoustic features into predator, danger, and social (safety) signals; a process occurring through sensory processing pathways (i.e., neuroception) that are too important to be dependent on conscious decisions (i.e., perception). We will use the subjective ratings provided in the manual as the criteria to support our hypothesis.

The IMRN Advisory Board

For Interactive biographies please go to:
https://www.misophoniainternational.com/advisory-board/

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Have Questions Or Concerns?

Please feel free to contant Jennifer Jo Brout with any questions or concerns. If your inquiry is immediate, she can also be reached on her business phone.

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Submit A Proposal

For University and Institution researchers interested in submitting a research proposal please send a one paragraph description of your idea along with your C.V. and institutional affiliation.

Note; we are not a grant-giving organization, but a community who wishes to raise money for research that we feel best aligns with our goals.

Our process for doing so, includes a working relationship with our researchers.

A form can be found here:
https://www.misophoniainternational.com/submit-a-proposal/

To directly email please contact:
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For More Information and Resources

Misophonia International (news site and magazine) provides news on research, coping, and advocacy for the lesser-known disorder, Misophonia. More than a news site, we also provide a magazine (as an e-book or print book) with longer articles and important research interviews. Our goal is to unite sufferers with researchers, and help sufferers become advocates for their own awareness and coping skills. Perhaps we're being idealistic, but, in the information age we feel it's worth it to reach out and band every one together in one place.

The creators, Dr. Jennifer Jo Kanter-Brout and Shaylynn Hayes both have Misophonia. Jennifer's advocacy work began two decades ago when her then small daughter showed signs of the disorder. Through Facebook groups her and Shaylynn met and decided to band together and do what they could to raise awareness and provide a valuable resource for sufferers and researchers alike.

Now known as Misophonia, auditory over-responsivity continues to be an elusive disorder. Our magazine connects sufferers to researchers and includes original interviews, research summaries, as well as sufferer accounts and coping advice.

Important Links

www.misophoniainternational.com - magazine and news site (research, coping, advocacy)
www.misophonia-research.com - home of the IMRN
http://observer.com/2016/06/if-you-suffer-from-misophonia-everyday-life-can-become-unbearable/ - Article in the NY Observer by Jennifer Jo Brout, PsyD.

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