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ORIGINAL ARTICLE

THE ROOT CAUSES OF MISOPHONIA: TEN TOPICS FOR FORMAL STUDY

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Abstract

Introduction: This article presents the results of some of my informal surveys and speculations from my private clinical psychotherapy practice regarding causes of misophonia and its possible relationship to family dynamics and other non-auditory factors. My hope is that researchers might take these as a starting point and conduct formal studies to verify or dismiss my informal results. My observations and relevant surveys address ten key questions and speculations about the root causes of misophonia. Understanding the causes of this complex disorder will lead to better treatments and possibly even prevent its development.

Material and methods: Following a brief section on context and background of existing research, ten proposed topics are presented for possible future research: Ancient brain; Genetics/ twins; Epigenetics/ family; Religion; Personality type; Trauma; Intelligence/ neural pruning; Gender expectations; Perinatal factors; Other considerations.

Results: The background for each of the ten topics is followed by a rationale for further exploration.

Conclusions: In the short number of years since misophonia was first identified as a distinct disorder, there has been increasing interest into more clearly defining the condition, and many studies have looked for potential causes. There is now ample evidence that it *exists*, but it is not yet clear *why*. So as to better understand this complex condition, this article proposes fertile avenues for future research.

Keywords: misophonia • causes • genetics • family factors • epigenetics

KORZENIE MIZOFONII: DZIESIĘĆ ZAGADNIEŃ DO NAUKOWEJ EKSPLORACJI

Streszczenie

Wprowadzenie: W niniejszym artykule przedstawiam wyniki szeregu nieformalnych badań własnych i rozważań przeprowadzonych w ramach mojej prywatnej praktyki psychoterapii klinicznej, dotyczących przyczyn mizofonii i jej możliwego związku z dynamiką rodziny oraz innymi czynnikami pozasłuchowymi. Mam nadzieję, że naukowcy potraktują je jako punkt wyjścia do przeprowadzenia formalnych badań w celu ich zweryfikowania lub odrzucenia. Moje obserwacje i badania dotyczą kluczowych pytań i spekulacji na temat możliwych źródeł mizofonii, których dokładne rozpoznanie i zrozumienie doprowadzi do opracowania lepszych metod leczenia tego złożonego zaburzenia, a być może nawet do opracowania sposobów zapobiegania jego rozwojowi.

Materiał i metody: W artykule zwięźle omówiono kontekst i podstawy dotychczasowych badań oraz zaproponowano dziesięć potencjalnych kierunków przyszłych badań, a mianowicie: mózg pierwotny, genetyka/ bliźnięta, epigenetyka/ rodzina, religia, osobowość, trauma, inteligencja/ przycinanie synaptyczne (ang. *neural pruning*), oczekiwania dotyczące płci, czynniki okołoporodowe, pozostałe kwestie.

Wyniki: Po omówieniu każdego z dziesięciu tematów podano uzasadnienie dalszych badań.

Wnioski: W ciągu kilku lat od momentu, gdy mizofonia została po raz pierwszy zidentyfikowana jako odrębne zaburzenie, wzrosło zainteresowanie bardziej precyzyjnym zdefiniowaniem tego schorzenia, a wiele badań skupiało się na poszukiwaniu jego potencjalnych przyczyn. Obecnie wiele jest dowodów na to, że zaburzenie to *istnieje*, ale nie określono jeszcze w sposób jednoznaczny *dlaczego*. W niniejszym artykule zaproponowano obiecujące kierunki przyszłych badań, których wyniki pomogłyby lepiej zrozumieć tę złożoną chorobę.

Słowa kluczowe: mizofonia • przyczyny • genetyka • czynniki rodzinne • epigenetyka

Introduction

Even though misophonia was initially identified by audiologists, there is no scientific evidence that the auditory system is the source of the disorder. An early fMRI study [1] found a connection between the auditory cortex and misophonic reactions related to the amygdala. This led to further investigation, resulting in the well-received paper entitled *The brain basis for misophonia* [2]. Numerous other studies [3] come mainly from neuroscience, psychiatry, psychology, and behavioral sciences. One wide-ranging review in 2024 [4] reported that the most frequently cited factors associated with misophonia were mental disorders and female gender. While there is some research on the relationship of misophonia and mental health disorders, including OCD/OCPD [5], most of the topics I set out below do not yet appear in the literature. It is these topics that I hope will spark further exploration.

As a solo practice clinician, over the past dozen years I have treated many hundreds of individuals and families affected by misophonia. I have taken their stories to heart and have conducted several informal surveys to consider whether their experiences are shared by others dealing with this complex condition. As I am not in a university or medical setting, I do not have the equipment or staff to conduct formal studies to test my observations, questions, and conclusions. It is my hope that researchers who are in such settings will find some of these speculations worthy of further investigation.

Topics for Investigation

Ancient brain

Is there a larger proportion of Neanderthal DNA in people with misophonia than those without?

Misophonia appears to be a fight or flight phenomenon, in which the brain acts like it is in danger and goes into survival mode. Do people with misophonia have more activation in the amygdala and/or the reptilian brain? Could this reflect more Neanderthal DNA?

Since the popularity of genetic analysis platforms such as 23andMe, there is more speculation about possible traits related to a variety of medical conditions, including misophonia. One reported factor is the percentage of Neanderthal DNA. The 23andMe reports include a section that includes:

- I have more Neanderthal DNA than __% of other 23andMe customers.
- All together, my Neanderthal ancestry accounts for less than __% of my DNA.
- ___ of ____ variations were tested.

I could find no research relating misophonia to Neanderthal DNA. There is one study [6] reporting that individuals with schizophrenia have less Neanderthal-derived genetic variation than unaffected individuals. Further imaging suggested a neurobiological mechanism underlying the associations with schizophrenia risk. A larger study [7] investigated Neanderthal genetics related to the shape of the modern cranium, but neither of these studies refer to misophonia.

I began to conduct an informal survey of people with and without misophonia who had results from their 23andMe genetic tests, asking them to provide their reports in the above format. I was unable to acquire a large enough sample to gather meaningful information. It seems that virtually everyone taking the test has less than 2% Neanderthal DNA. If that is accurate, then that piece of information is probably not useful. However, for unexplained reasons, respondents reported anywhere from 200 of 2872 variations tested to 313 of 7462 variations tested. It would be helpful to communicate with the 23andMe company for an explanation of their reports, allowing better comparisons between misophonia and non-misophonia respondents to be made.

If research could confirm any connection between Neanderthal DNA and people with misophonia, there could be a case for calming the adrenaline reaction to certain sounds through cognitive and/or somatic psychotherapy.

Genetics/ twins

Are people with misophonia more likely to have a family lineage including this or other neurological disorders, compared to families without misophonia?

There are many speculations about the possibility of genetics as a source of misophonia. The only article [8] that I could locate on genetics related to misophonia is one discussing a particular aspect of misophonia – rage – found in 23andMe reports. That leaves a wide-open field of possibilities to explore whether misophonia might be genetically based.

In my clinical approach, I always create a genogram (family tree), in which I ask if there are other family members on either parental side who have any known neurological condition. There always seems to be someone in three generations of the extended family with ADHD, dementia, autism, or other neurological diagnosis. In some cases, there are reports of close family members with misophonia.

I have seen a number of clients who have a twin, sometimes with a different kind of issue (such as ADHD), but very few where both twins have misophonia, even in identical twins. I think it would be useful to research whether identical twins, fraternal twins, or other siblings are also more likely to have misophonia. In my experience, very few do, but I have no solid data about it, and could find no research addressing that issue.

Epigenetics/ family

What role do epigenetics and family factors play in the development of misophonia?

We could think of genetics as the “nature” axis and epigenetics as the “nurture” axis. As defined by medlineplus.gov, “Epigenetics is the study of how cells control gene activity without changing the DNA sequence. ‘Epi-’ means on or above in Greek, and ‘epigenetic’ describes factors beyond the genetic code. Epigenetic changes are modifications to DNA that regulate whether genes are turned on or off” [9].

There does not seem to be much research addressing epigenetic factors in misophonia. The most obvious factor that could affect the genetic aspect of misophonia would be things that occur within the family environment. It is commonly observed that people with misophonia react much more strongly to sounds made by other family members or close contacts. A few studies [e.g. 10] have looked at whether the context of a sound source was a factor in misophonia.

Another study [11] of factors such as age, psychiatric disorders, and maternal psychological states reported that "Children with misophonia did not differ from their peers in terms of ADHD, ODD, ASD, dyslexia, social and emotional competencies, head injuries, epilepsy, tinnitus, being prematurely born, or delivered via cesarean sections. However, they had significantly higher symptoms of anxiety and depression, more frequent occurrences of OCD, migraines, and psychosomatic complaints. *Their mothers self-reported postpartum depression significantly more frequently than mothers in the control group*" (emphasis added).

In one study [12] addressing tinnitus and hyperacusis, it was reported that patients seeking treatment for those conditions and who were screened for suicidal ideation were more likely to have a parent suffering from a mental illness in the patient's childhood. By extrapolation, it could be speculated that those with misophonia might also have had a parent dealing with mental illness. More study could be done to explore the relationship between these factors.

Epigenetics may also account for transgenerational trauma, a repository of past traumas and emotional overwhelm that affects future generations. One book [13] discussing this in depth refers to several studies of descendants of the Holocaust. These studies looked at whether symptoms of the deceased's trauma could be seen in their children, even two or three generations later. One study [14] conducted by the Max Planck Institute in Munich found that:

- Descendants of Holocaust survivors had higher than average PTSD symptoms compared to the general population, and
- The makeup of their *FKBP5* gene – the gene that regulates stress – was fundamentally altered.

If misophonia is possibly genetic, that may account for it developing with age, usually showing up in late childhood or around puberty. But then why does that hardwired switch suddenly turn on? Did something happen to cause it? I believe a significant contribution to understanding possible causes of misophonia would be research into family dynamics, to determine whether some environmental factors are contributing epigenetically to that switch being unwittingly turned on by parental actions. The next section addresses one potentially significant family factor affecting the development of misophonia.

Religion

Is there a larger percentage of people with misophonia in the US who were raised in families of origin which adhered to more structured religions compared to less structured religions?

Two themes I often hear in therapy sessions with misophonia clients are guilt and shame. Although sometimes used interchangeably, the distinctions are:

Guilt – a focus on *behavior*:
- I *did* something bad or wrong
- I'm sorry – I *made* a mistake
- If only I hadn't…
- Linked to empathy and understanding other perspectives
- Can be motivating to work toward change.

Shame – a focus on the *self*:
- I *am* bad for what I did or just for being who I am
- I'm sorry – I *am* a mistake
- If only I weren't…
- Highly correlated with addiction, depression, aggression, eating disorders, violence, bullying, suicide.

Although initially I did not consider the connection, these two themes could easily be seen as related to religious upbringing. As has often been the case, clients raise questions about the source of misophonia, and sometimes their thoughts have led me in a new direction. One such situation involved a man in his 30s from a Hispanic background. He told me his mother went to Catholic church daily, and that he was also expected to go regularly. He recounted being instructed in concepts of guilt, shame, sin, evil, right and wrong – concepts fairly basic to his religion. He wondered if there might be some connection with his development of misophonia. I had never considered this factor, so I decided to do a very informal survey of people on a Yahoo list group called Sound Sensitivity. Without explanation, I tossed out a question: what was the religion of your family of origin? (Because my interest was in factors affecting their own upbringing, I specified "family of origin" as distinguished from their current family.) The results were surprising:

- Of about 100 random respondents, more than 40% had been raised Catholic;
- Adding in other highly structured religions, the number was closer to 66%;
- The US population of Catholics at that time was about 22%.

Why the disproportionate amount? Could it be related to guilt/shame? I wonder if more highly structured, more rigid belief systems with stricter rules about acceptable behavior, and more black-and-white or all-or-nothing thinking could relate to the development of misophonia. One respondent to the survey commented:

"I think many people with religious upbringing are taught to not confront, disrespect, or question those who are looked at as leaders or elders which include parents. We were expected to sit at the dinner table while the adults chew, smack, crunch but tell the children to eat with their mouth closed. When it's pointed out to us as kids and then we see adults doing it (mainly mom and dad) we can't say anything about it. It grows and festers… You see it more and more. It becomes louder and more apparent. You start to focus in on their noises and why can't you tell them to stop. Because it's disrespectful… Guilt and shame of the feelings, and also resentment, build and build."

Table 1. Responses of 195 people on the Sound Sensitivity Yahoo group to what is your 4-letter type on the Myers–Briggs Inventory?

	Introvert	Extrovert	Total
Judging	92 (49.5%)	22 (61.3%)	114 (61.3%)
Perceiving	43 (23.1%)	29 (15.6%)	72 (38.7%)
Total	135 (72.6%)	51 (27.4%)	186 (100%)

Note: Results exclude 9 mixed types [17]

This was a very informal survey [15], not a scientific study. Formal research is lacking. An internet search for "misophonia and religion" finds very few mentions, other than comments on sites such as Reddit, where individuals express opinions and concerns. I would be very interested to see what a larger, more structured study would reveal, and how that information might be utilized to help families coping with this condition.

Personality type

Is personality type a factor in misophonia?

Are people with misophonia more likely to have Myers–Briggs types IJ (Introversion/ Judgment) than the average percentages of those types in the general population? This was a question raised by a client whose psychology class administered the MBTI to students. This inventory, developed in the 1940s with a long-standing record for workplace application, has four paired polarities, giving 16 possible combination of letters. Details of each type can be found on the Myers–Briggs website [16]. Their definition of INTJ sounds like it could easily describe many people with misophonia: "Have original minds and great drive for implementing their ideas and achieving their goals. Quickly see patterns in external events and develop long-range explanatory perspectives. When committed, organize a job and carry it through. Skeptical and independent, have high standards of competence and performance – for themselves and others" [16].

There are many online articles and studies related to the MBTI, but I could find none specifically regarding its relationship to misophonia. My curiosity to answering this student's question led me back to the Sound Sensitivity Yahoo group where I asked, "If you have taken the Myers–Briggs Inventory, what was your 4-letter type?" 195 people with misophonia responded to my request for MBTI types [17]. The results are shown in **Table 1.**

The results show that:

- Almost two-thirds of respondents are judging (J);
- Almost three-fourths of respondents are introverts (I), while only about one-fourth are extraverts (E);
- Half of respondents are introvert/judging (I/J), while the other half are split among the other three cells;
- Of the 114 total Js, almost 81% (92) are introverts (I).

Again, this is not a scientific study, just a survey of those who self-selected to answer my query about their type. Because I was answering my client's question about the I/J components, I disregarded the two other dichotomies. It would be interesting to see what a more complete study of personality types would yield. A further question would be whether people with misophonia were already I/Js or if their misophonia experiences led to their more introverted and judgmental behaviors.

Trauma

Is there a correlation between onset of misophonia symptoms with stressful life circumstances? Do people with misophonia have higher ACEs (Adverse Childhood Experiences) scores than comparison groups?

The ACE study was conducted in 1998 by the US government Center for Disease Control (CDC) in conjunction with Kaiser Permanente (one of the largest Health Maintenance Organizations in the country) [18]. Participants were mostly white middle-class and upper middle-class people in San Diego, CA. The study measured 10 types of childhood trauma. Five were personal (physical, verbal, or sexual abuse, and physical or emotional neglect), and five related to family (alcoholism, domestic violence, incarceration, mental illness, or abandonment). The study found that two-thirds of the 17,000 people had at least one of these ten traumas in their history. And of those two-thirds, 87% had more than one of these traumas. These were people with good jobs and good health care, not impoverished or poorly educated people.

Another study [19] also found that there was a strong correlation between high ACEs scores and outcomes of serious health issues in adults: chronic adult diseases, heart disease, lung cancer, diabetes, autoimmune diseases, social and emotional problems, depression, alcohol/drug addiction, violence, being a victim of violence, or suicide. In a study [20] of over 300 people with misophonia, only posttraumatic stress disorder (PTSD) was related to the severity of the misophonic symptoms. I could find no studies of ACEs scores related to misophonia. This could be a valuable area of research in understanding the possible connection between early life traumatic events and development of the condition.

Intelligence/ neural pruning

Do people with misophonia have less neural pruning than others?

Neural or synaptic pruning has been confirmed in many brain scan studies [21]. Scans done at birth show that there are few neurological connections in the brain. Within a few years, scans show increased density of connections that makes the image appear darker. By early adolescence, there are so many neural connections, there is almost no white

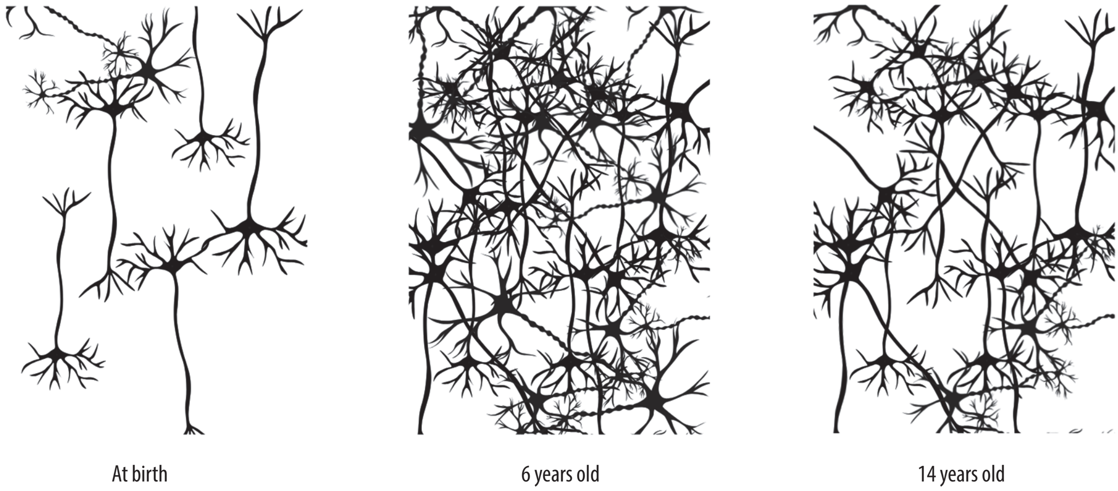

Figure 1. Graphical representation of neural scans

space. The brain then "prunes" out neural pathways that are not being used to allow more efficient functioning (see **Figure 1**).

In my clinical experience, people with misophonia have above average intelligence. I have worked with many hundreds of people with this condition and have yet to find anyone who is not very bright. Despite their challenges in the classroom with sounds and visual distractions, almost all misophones I have seen get excellent grades in school. They often seem to have hyper-auditory acuity and sometimes also hyper-visual acuity. These observations lead me to wonder about their brain activity. Do they have more active connectivity in the brain leading to higher intelligence and also to higher sensitivity?

I would welcome fMRI or other research comparing misophonia and non-misophonia brains in terms of neural density, or indications of less synaptic pruning.

Gender expectations

Are girls more often affected by misophonia in part because they are acculturated to be less assertive and to have weaker boundaries around other people?

I have seen many hundreds of young adolescents with misophonia. In my practice, at least 75% are female, or AFAB (assigned female at birth). Although there is some disagreement, most research regarding gender and misophonia indicates that females account for a larger percentage of patients with this condition [22], and more severity of symptoms [23]. While hormones in females might play a part (especially considering that symptoms often manifest around puberty), that would not explain the presence of symptoms in males. In my clinical observations, there may be a different explanation for the disparity between females and males with misophonia.

Females in our culture are generally expected to be nice, good, quiet, take care of others, suppress their needs, more passive, and definitely not aggressive. They may be discouraged or punished for expressing emotions. It becomes very difficult for girls to speak up for themselves, to ask for what they want. My teen female clients often exhibit features of the "parentified child." They might assume responsibility for matters generally presumed to be parental tasks, and frequently say they do not want to tell their parents what is happening because they don't want to upset the parents. They may develop ways of coping that turn their difficult feelings onto themselves (eating disorders, self-injury, compulsive behaviors, or suicidal thoughts).

In his book, *When the Body Says No: The Cost of Hidden Stress* [24], physician and author Gabor Maté discusses both the research and his clinical observations on a variety of medical conditions, such as autoimmune disorders, ALS (Lou Gehrig's disease), MS (multiple sclerosis), and various kinds of cancer. He found surprising correlations between illness and repression of emotions, especially anger. Research and observations such as these have led me to wonder whether unexpressed emotions and lack of assertiveness might be factors in there being more females struggling with misophonia.

I believe it would be useful for parents to allow and even encourage their daughters' expression of feelings, even "negative" ones, so their anger does not continue to build, and so that perhaps they will not develop symptoms of misophonia or other illnesses. Assertiveness training for both parents and their children would be an interesting research project, and could potentially reduce the appearance of misophonia.

Perinatal factors

Is there any correlation between misophonia and an issue in any particular part of a pregnancy or delivery, or related to infant or early childhood illnesses?

There has been extensive research [25,26] on the effects of prenatal stress on fetal development. Some outcomes noted are low birth weight, premature birth, heart defects, cleft lip, other birth defects, and other physiological issues such as pre-eclampsia [27] or gestational diabetes. Significant health issues have been found in adults who are the products of such stress in their birth mothers [28]. Other research has found that early childhood illnesses have led to such disorders as PANS (pediatric acute-onset neuropsychiatric syndrome), PANDAS (pediatric autoimmune neuropsychiatric disorders associated with Streptococcal infections), or sudden onset of OCD [29]. I have found no research addressing the potential relationship of such conditions with misophonia.

There is also a process called fetal microchimerism (FMc) [30], in which cells pass through the placenta from mother to fetus throughout pregnancy and shape conditions for brain function later in life; cells also pass from fetus to mother and can stay in her organs for many years. When I do an initial intake with a family and ask about pregnancy history, I often hear of miscarriages, abortions, difficult births, or premature deliveries via C-section. It does not appear that any research has been done to see if there is any connection with misophonia. I am curious about whether an incomplete pregnancy might have left behind vestiges of the earlier fetus that somehow might impact a later pregnancy, and maybe contribute to a disorder such as misophonia.

Other considerations

Is there a relationship between eating disorders and misophonia?

I have seen several adolescents with misophonia and eating disorders. This does seem a logical connection, but other than anecdotal reports on sites such as Reddit, I could only find one study [31] with three cases.

Is there a relationship between allergies and misophonia?

People with misophonia usually have sensitivities to more than one sound, and are often very selective about what they eat, which could have to do with sounds or maybe for other reasons. It is sometimes said that they are "allergic to sound." Are people with misophonia also dealing with food allergies, sensitivity to scents, and having more reactivity to environmental chemicals and toxins? The only references I found were anecdotal, on Reddit.

Is there a relationship between self-injury and misophonia?

Several of my adolescent misophonia clients, especially females, eventually disclose they have engaged in self-injury. Sometimes they report hitting their head, but usually it involves cutting themselves in areas that are hidden from parental view. This is not generally related to suicidal ideation, but more of a stress or pressure release.

I found only one study [32] addressing self-harm and misophonia. More research in this area would be a significant contribution to the literature on misophonia.

Conclusions

In the short number of years since misophonia was first identified as a distinct disorder, there has been increasing interest and research to more clearly define the condition, and many studies looking for potential causal factors. There is now ample evidence that it *exists*, but it is not yet clear *why*. This article proposes some additional directions that I hope future research might take in bringing more understanding to this complex condition, so that more targeted treatment and possibly prevention can occur.

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