Misophonia; Evaluation and Treatment

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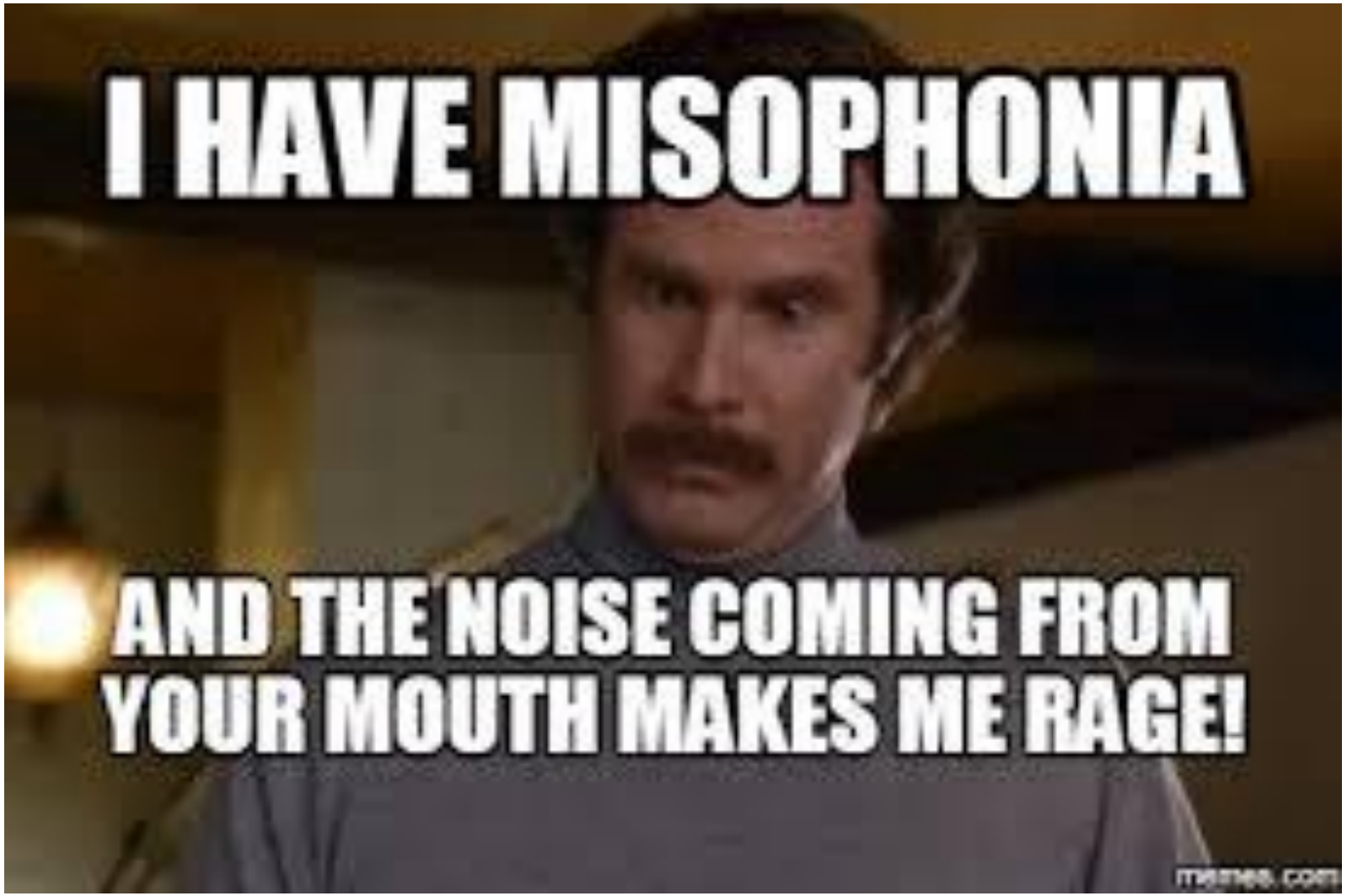

I HAVE MISOPHONIA
AND THE NOISE COMING FROM YOUR MOUTH MAKES ME RAGE!

Background

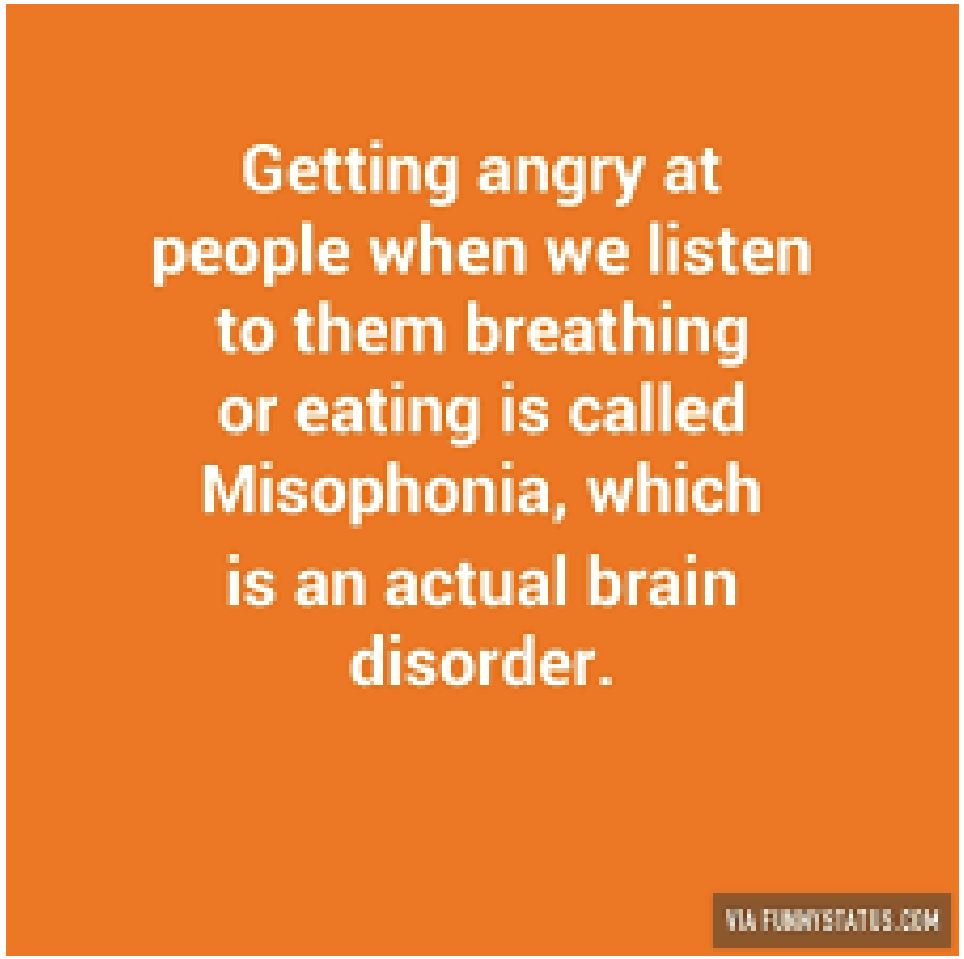
- Audiology Background:
  - Education:
    - UGA – BSEd in Communication Sciences & Disorders – 1992
    - UF – Master of Arts in Audiology – 1994
    - UF, Distance Learning Program – AuD – 2004
  - Career
    - CFY – Memphis, TN – Memphis HA and Audiological Svcs – 1994-1995
    - Atlanta, GA – Northside Hospital – 2000-2009
    - Atlanta, GA – DeKalb Medical – 2009-1013
      - Audiologist and Outpatient Rehab Supervisor
    - Cumming/Alpharetta, GA – Little Listeners – 2013 to present
      - Owner and Audiologist – Private Practice in APD Evaluation and Treatment

Background continued….

- Misophonia Background:
  - “Triggered” for as long as I can remember
  - Triggers include:
    - *Many* things essential to other humans for sustaining life:
      - Eating noises (chewing, popping, clicking, crunching, etc..)
      - Breathing noises (nose whistles, heavy breathing, snoring)
    - Clicking/Tapping (pens, nails, shoes, computer keyboards, etc…)
    - Crackling (candy and snack wrappers)
    - Visual triggers:
      - Facial ticks
      - Fidgeting


NEXT TIME
THEY WON'T CHEW SO LOUD!

But in all seriousness…



What is Misophonia?

- An irrational/negative emotional response to an auditory or visual trigger, not seen in typical listeners, that elicits:
  - Irritability, Anger, Anxiety, Discomfort, Rage, Violence, etc…
- Modulated emotional responses to "triggers" based on the social context:
  - Typically more aggressive towards friends and family members suggesting a cognitive component for thought distortions and cognitive control
- Involves an involuntary response with a feeling of loss of self-control
- "Triggers" are selective depending on the individual, they typically have a specific pattern and/or meaning to the individual and can vary depending on the environment in which it occurs.
- Physical characteristics (pitch, volume, duration…) are typically secondary aspects and do not necessarily impact the Misophone's level of reaction.
- Develops through classical conditioning of the emotional reflexive response with repetitive exposure to the "trigger," typically starting in early puberty or adolescence.
- The presence of similar responses to auditory and visual "triggers" suggests it maybe more of a general sensory condition than just auditory alone.

History of Misophonia:

- First coined as “Misophonia” in 2001 by Drs. Pawel & Margaret Jastreboff
  - Miso (greek for “hate”) and phonia (meaning “voice, sound”) – “hatred of sound” – a literal translation is a bit strong and should be avoided.
- Previously labeled in 1999 by Dr. Marsha Johnson as Selective Sound Sensitivity Syndrome (4S).
  - “Arguably, 4S is a more accurate and descriptive name for this condition because each individual has his or her own set of commonly occurring sounds to which they are highly reactive.” Thomas Dozier, “Counterconditioning Treatment for Misophonia,” 2015
- Other disorders of “oversensitivity to ordinary sounds” includes:

* Hyperacusis	* Recruitment	*Hyperacousia	*Auditory Hyperesthesia
* Dysacousis	* Odynacusis	* Phonophobia	* Auditory Dyesthesia
* Auditory Allodynia		* Increased Noise Sensitivity	
* Collapsed Tolerance Level		* Decreased Sound Tolerance	

Incidence of Misophonia:

- Largely unknown since it's a relatively new diagnosis
- Estimates based on informal studies include:
  - 20% of 483 undergraduate psychology students surveyed reported significant Misophonia traits (Wu et al., 2014)
  - 3.2% of the general population estimated based on the incidence of tinnitus, hyperacusis and misophonia. Decreased Sound Tolerance – DST – disorders as characterized by Dr's Jastreboff in 2014 – "Treatments for Decreased Sound Tolerance (Hyperacusis & Misophonia")

Common “Triggers”

- *Auditory Triggers*:
  - Typically “human produced”:
    - Eating noises:
      - Smacking, chewing, crunching, popping…
    - Breathing noises:
      - Coughing, sneezing, snoring, throat clearing, heavy breathing…
    - Body movement noises:
      - Tapping feet/fingers, clicking nails, shuffling feet…
  - Object sounds:
    - Clock ticking, bag rustling, pen clicking, low bass sounds…
- *Visual Triggers*:
  - Typically repetitive and “human produced”:
    - Facial tics, leg bouncing/swinging, adjusting clothes/seat belt


IF SOMEONE TELLS YOU THEY HAVE MISOPHONIA
DON'T START CHEWING LOUDLY, SLURPING DRINKS, JUST TO ANNOY THEM

Diagnostic Criteria for Misophonia:

- ***There is no current ICD-10 or DSM-5 code for Misophonia***
- Diagnostic indicators defined by Amsterdam Psychiatrists in 2013 include:
  - Irritation, anger, and/or disgust in response to the presence/anticipation of a human-produced sound
  - The emotional response is followed by loss of self-control resulting in verbal or physical outbursts or withdrawal/avoidance.
  - A realization that the emotional response is irrational, unreasonable and/or out of proportion to the offense.
  - The emotional response causes significant distress that interferes with day-to-day activities or interpersonal relationships.
  - The emotional response has not been attributed to another similar psychological disorder such as OCD, PTSD, etc…

Other Common Characteristics:

- Responses tend to be angry or aggressive rather than assertive:
  - Verbal outbursts/insults and angry glares
  - Moral judgments of the “offender”
- Onset is typically early puberty or during adolescence
- Initial triggers are typically eating noises beginning with family meal
  - My Sister was my original “offender” with chewing ice at the dinner table
- Misophonics tend to be “Black and White” or “All-or-Nothing” thinkers
- Triggers intensify and increase over time and can eventually occur with simple *anticipation* of a trigger (i.e. – seeing someone buy gum can trigger a response before the smacking/popping even starts)


THAT SINKING FEELING
WHEN YOUR FRIEND OPENS
A PACKET OF GUM

Similar (but different) Auditory Disorders:

- ***Tinnitus*** - a sensation of noise caused by a bodily condition that is typically subjective - only heard by the one affected.
  - Misophonia is an over-reaction to “real world” sounds
- ***Phonophobia*** – “fear” of certain sounds
  - Misophonia evokes a different emotional response – typically not fear
- ***Hyperacusis*** – sound sensitivity typically associated with intensity of the sound
  - Misophonia is sensitivity to certain sounds, most of which are very quiet and easily ignored by others. Hyperacusis typically evokes Misophonia, but Misophonia does not evoke Hyperacusis. Co-existence of the two is common.

Misophonia vs. OCD

- Co-morbid incidence of OCD and Misophonia is estimated around 52%, but it has also been suggested that Misophonia could some day be labeled as a type of OCD Spectrum Disorder
  - Misophonia is an ***obsession*** with the trigger paired with maladaptive behavior (avoidance, escape, distraction), which has similar characteristic traits to OCD
- Onset and progression of Misophonia symptoms over time mirrors that of OCD. (early adolescence with progressive worsening over time)
- Primary differentiating characteristic is the lack of compulsions in Misophonia
  - In OCD, the compulsions include behavioral or mental acts in response to triggers that may or may not be related to the actual trigger.
  - In Misophonia, responses are specific to making the trigger stop or avoiding it.


HEARING PEOPLE CHEW
MAKES ME WANT TO PUNCH THEM IN THE FACE
memes.com

Misophonia vs. Other Sound Sensitivity Disorders

	Misophonia	***Aud Fig Grnd (APD)***	***Tinnitus***	***Hyperacusis***	***Phonophobia***
Sounds	Human produced/"annoying"/ not typically loud	Difficulty hearing speech in background noise	“Internal”/only heard by sufferer	Typically loud sounds (public toilets, fireworks, sirens, etc…)	Can be anything associated with a bad experience
Reaction	Anger/aggressive/ outbursts/ moral judgement of others	Typically a behavioral response (inattentive, overactive, frustrated…)	Various depending on severity	Pain response (cry, cringe, cover ears, run away, etc…)	Fear response similar to Hyperacusis but may have an anticipation component too
Treatment	Psychology; CBT or DBT, Audiology or OT; Sound Based Intervention (SBI)	Audiology; Auditory Training	Audiology; TRT, desensitization, amplification	Occupational Therapy; Sensory processing therapy	OT and Psychology

Other Disorders with Similar Complaints:

- Obsessive-Compulsive Disorder (OCD)
- Attention Deficit Disorder (ADD)
- Post-Traumatic Stress Disorder (PTSD)
- Auditory Processing Disorder (APD)
- Tinnitus
- Hyperacusis

How is Misophonia Diagnosed?

- Mostly diagnosed by case history review of common characteristics:
  - Early adolescent onset (8-9 years of age)
  - Starts with an initial trigger, typically with a single family member, and often around the dinner table
  - Triggers typically include “human-produced” noises, often associated with eating
  - Triggers can be auditory, visual or both
  - The reaction to the trigger is typically rage/anger and/or aggression
  - “Offenders” are most often close friends and family members
- No known objective measurements currently exist as Misophonia does not appear to be a dysfunction within the auditory pathways. It is the functional connections of the auditory pathways with other systems in the brain (specifically the Limbic system) that appear to be the culprit.
  - Sub-conscious connections over-activate the limbic and autonomic nervous system

How is Misophonia Diagnosed?

- There are multiple assessment questionnaires that can help diagnose and determine severity:
  - Misophonia Assessment Questionnaire (MAQ) – Dr. Marsha Johnson
  - Misophonia Coping Responses (MCR) – Dr. Marsha Johnson
  - Misophonia Trigger Severity Scale (MTS) – Natan Bauman
  - Misophonia Activation Scale (MAS) – Misophonia UK

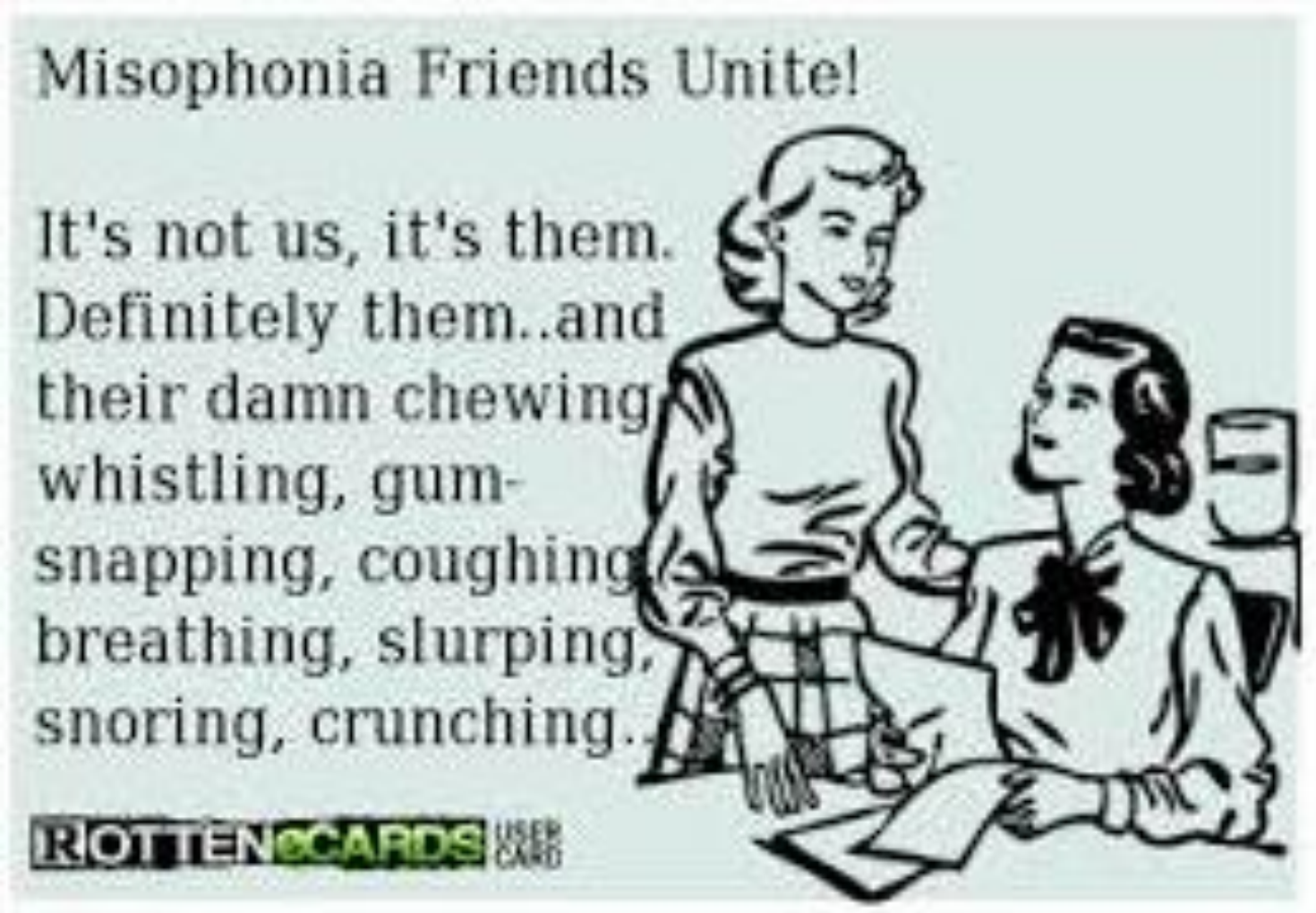

KEEP CLICKING THAT PEN
I DARE YOU
memegenerator.net

Current Treatment Options for Misophonia:

- CBT (case study on one woman - Bernstein, et. Al, 2013)
  - A three tiered approach was successfully administered including:
    - Cognitive component – challenged dysfunctional automatic thoughts
    - Behavioral component – interrupted maladaptive coping/avoidance strategies and introduced helpful ones
    - Psychological component – recalibrated autonomic reactivity
  - Reassessment 4 months after treatment showed a stable condition
- Misophonia Management Protocol (MMP) – Dr. Marsha Johnson 2014
  - Includes two separate components
    - Sound masking device – white noise generator
    - 6-12 weeks of CBT or similar therapy
- Medication for decreasing anxiety, depression and other negative reactions (no reports in literature showing positive effects from medication)

Current Treatment Options for Misophonia Continued:

- Tinnitus Retraining Therapy (TRT) - Drs. Pawel Jastreboff and Margaret Jastreboff – Emory University, 2013)
  - Based on the theory that Misophonia involves an enhanced functional connection to the limbic and autonomic nervous system
- Counterconditioning – limited research on this approach
  - Involves pairing a positive auditory stimulus with a misophonic trigger to fade out the involuntary emotional response (weaken and remove connections so that the conditioned reflexes become extinct)
- Little Listeners observations on Auditory Training as an effective approach to eliminating Misophonia reactions:
  - My own personal reactions to my "triggers" have diminished with exposure to auditory training in my clinic (specifically IM)
  - Theory – therapy to strengthen the "classical" auditory pathways may effectively "shut down" the over-reaction of the amygdala that is stimulated via the "non-classical" auditory pathways (the ones that give us our "caveman ears")



It’s definitely US…. Not THEM!

Brain-Based (Structural) Theories

Kumar, et. Al – "The Brain Basis for Misophonia" – 2016

- fMRI showed an increase in blood-oxygen-level-dependent (BOLD) responses in the anterior insular cortex (AIC) when a misophone is exposed to a trigger
  - Trigger sounds associated abnormal connections between AIC and ventromedial prefrontal cortex (vmPFC), posteromedial cortex, hippocampus and amygdala.
  - Trigger sounds elicit increased pulse rate and galvanic skin response – mediated by AIC activity
- Questionnaire results revealed higher scores on interoceptive sensibility (supports abnormal AIC function).
- Brain structure measurements revealed greater vmPFC myelinization in misophones

***** "Abnormal salience is attributed to particular sounds based on the abnormal activation and functional connectivity of AIC"*****

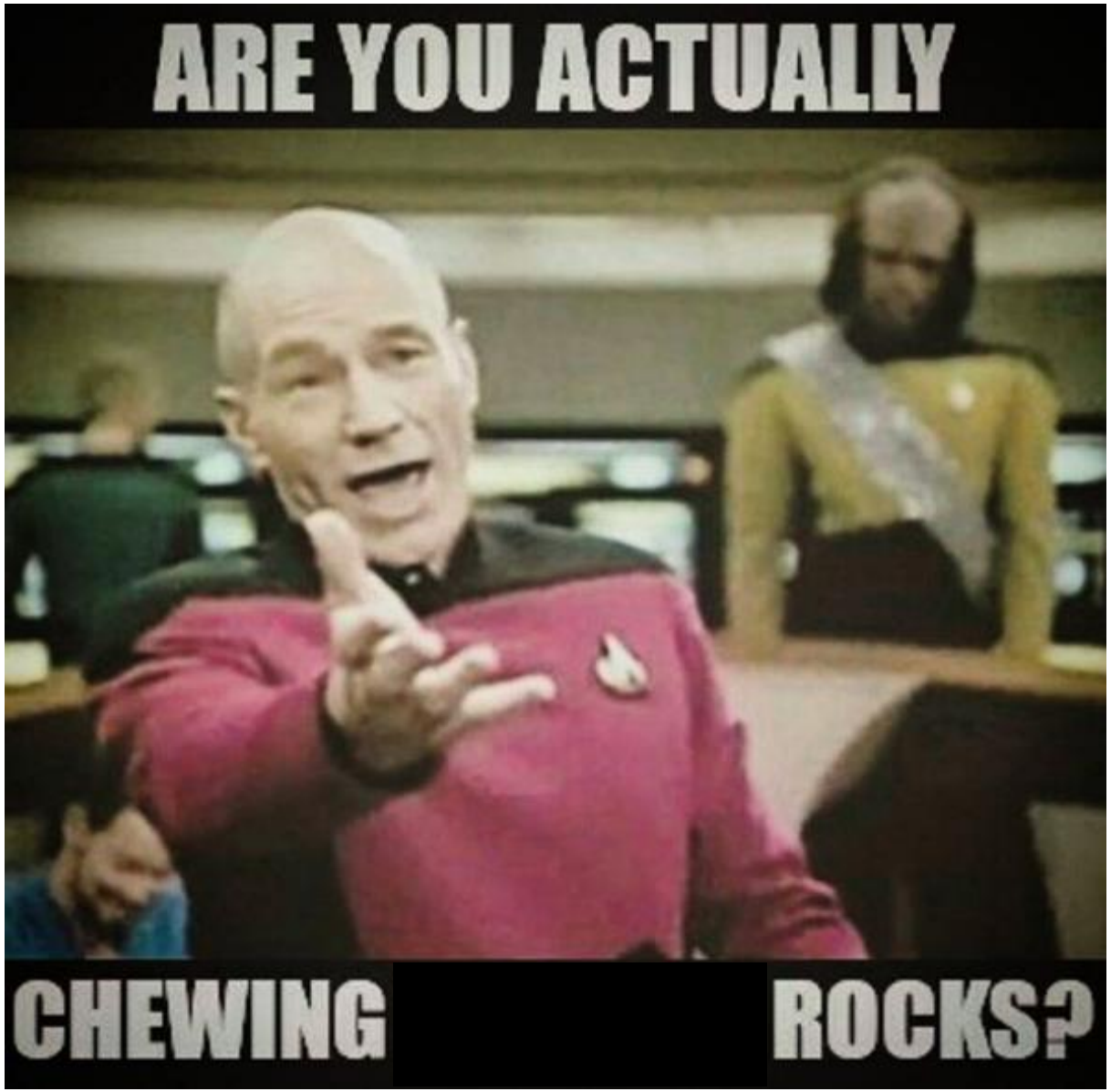
Brain-Based (Structural) Theories

Schroder, et. Al – "Diminished N1 Auditory Evoked Potentials to Oddball Stimuli in Misophonia Patients." – 2014

- Investigated the possibility of dysfunction in the brain's early auditory processing system as a source of Misophonia. Subjects watched a silent movie with repetitive/predictable, environmental sounds (they were told to ignore) and randomly occurring "oddball" sounds.
  - Revealed a smaller N1 peak amplitude with an oddball stimuli in misophones
    - Suggests an underlying neurobiological deficit in misophones that reflects a basic auditory processing impairment.
    - Similar N1 reduction effect seen in cocaine abuse, Schizophrenia and bipolar disorder
  - No difference in P1 or P2 responses with oddball stimuli

Shroder study continued…

- Reflects an anomaly in the way these subjects filter novel information in their auditory environment and suggests a “deficit in auditory information processing at a low-level in misophonia patients.”
- Abnormal left orbitofrontal cortex (OFC) activation may also exist that could explain the discrepancies between aggression in some “unintentional” sources (babies, elderly, demented…) and “intentional” sources.
- As a result, there is still uncertainty as to whether a diminished N1 is due to psychopathology or if it is a true, physical characteristic of Misophonia.
  - Is the “underlying deficit in misophonia due to altered auditory perception, an inadequate processing of auditory stimuli, or a higher order dysfuncion of cortical control related to impulsivity?”



F%&#IN

Little Listeners' Theory

- Based on personal changes noted since starting Interactive Metronome (IM) training on all Little Listeners in our clinic.
  - Secondary exposure to 1-3 hours of IM training 3-5 days per week
  - We use speakers instead of headphones so we can monitor the kids' progress and assist when needed.
  - We often have to intervene and help the kids get on tempo and clap with them to keep them on track
  - We engage in distraction activities with the kids that require us to stay on beat as well:
    - Phonemic Synthesis Training
    - H & Friends phonological discrimination practice
    - Working Memory tasks

Little Listeners' Theory continued…

- Changes noted slowly over the past 2 years of IM exposure in clinic:
  - Sharper memory
    - Remembering names
    - Recalling details
    - Remembering where I parked
  - Understanding song lyrics and Spanish better
  - Improved tolerance for Misophonia triggers
    - Improved from a "I want to punch you in the face" level to a "that's annoying" or eye-roll only level
    - The triggers are still there, but they don't cause extreme agitation as before
    - I'm able to shift my focus to another activity easier

Little Listeners' Theory continued…

- If Misophonia is associated with dysfunction in the early auditory processing system as Shroder has theorized, then doesn't it seem reasonable to think that remediation of auditory processing disorders might have a positive effect on reducing misophonia?
- If Misophonia is an over-reaction of the non-classical auditory pathways to the limbic system that is typically suppressed around 7-8 years old with maturation of the classical auditory pathways, then wouldn't it be reasonable to think that therapy to improve auditory processing skills would also help to suppress that overactivity, even beyond the typical maturation age?
- Could the exposure to the IM therapy in my clinic have suppressed my limbic system reaction to my triggers?


MISOPHONIA TRIGGERED
TEDDY BEAR TO GRIZZLY BEAR
IN 2 SECONDS FLAT

Case Study

- JB is a 16 year old female with Misophonia
  - Onset around 11 years of age around the dinner table, although mom suspects it was sooner. Original “offender” was her little sister.
  - Triggers include chewing, gum popping, heavy breathing, pen clicking, slurping, and sniffing
  - Physical reactions include irritation, hand twitching and heart racing
  - The Misophonia Activation Scale (MAS) was administered ranking severity at a Level 9 out of 10 which is described as “A person with misophoina experiences a full panic/rage reaction and makes a conscious decision not to use violence on the trigger person. They remove themselves from the vicinity of the noise and may use physical violence on an inanimate object. The person’s demeanor shows panic, anger and/or severe irritation.”

Case Study continued…

- Misophonia Assessment Questionnaire(MAQ) revealed a score of 36 out of 68 with the following complaints reported to occur “almost all of the time:”
  - My sound issues make me feel angry
  - My sound issues do not seem to have a known cause
  - My sound issues make me feel frustrated
  - My sound issues impact my family relationships
  - My sound issues have not been recognized as legitimate
- No known academic weaknesses
- Attends psychological therapy for anxiety and depression
- No communication difficulties reported
- Only social skills difficulties reported included that she is shy

Case Study continued…

- Audiological results
  - Pure tone thresholds between -10 and 5 dB (particularly low for my equipment)
  - OAE's very robust, particularly in the right ear
  - Acoustic reflexes present for ipsi and contra stimulation at 80-85 dBHL
  - Acoustic reflex decay was negative bilaterally with no subjective complaints from the subject during testing.
- Auditory Processing Testing results
  - SPIN – Normal in both ears
  - *SSW - Normal NOE scores for all 4 conditions, but a positive order effect (-4) and excessive reversals*
  - *PST - Abnormal with 21 correct Quantitatively and Qualitatively*
  - PPST – 100% for the verbal condition
  - NU-6 Low Pass – Normal in both ears
  - *SCAN-3A - Normal sub-test scores with a significant REA for all 3 sub tests; CWDE, CS and TCS*
  - *TAPS 3 Memory battery - Scaled scores 4-6 for all sub-tests*
  - *Interactive Metronome (IM) Long Form Assessment (LFA) - Elevated score*

Case Study continued…

- Recommendations:
  - Minimum of 20 sessions of auditory therapy, focusing on
    - the most difficult listening tracks of the PASE Program for Words in Noise, Competing Words and Distorted Words
    - completing Interactive Metronome training for the hard template before discharge
    - completing Phonemic Synthesis training through all 15 lessons before discharge
- Anticipated outcome:
  - Reduce the MAS and MAQ scores slightly by therapy completion
  - Reduce the MAS and MAQ scores significantly after follow-up in 6 months
  - All Auditory Processing skills should be age appropriate by therapy completion date.

Questions??....


OVERWHELMING SENSITIVITY TO SOUNDS IS COMMON IN DISORDERS SUCH AS AUTISM AND ASPERGER'S
AND JUST LIKE THESE DISORDERS...
MISOPHONIA IS not FUNNY.
WWW.MISOPHONIAINTERNATIONAL.COM