Misophonia, A Conditioned Aversive Reflex Disorder

by Tom Dozier, MS

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Reflex

• Stimulus → Response
• Automatic / involuntary response
• Types of reflexes
  – Innate / inborn / unconditioned (100% genetics)
  – Acquired / conditioned reflex (experience)
Inborn Reflexes

- Baby – rooting reflex
- Common reflexes
  - Sweating, shivering, goosebumps
  - Food processing – swallowing, digestion
  - Breathing, heartrate
- Reflexes to sound
  - Startle reflex
Startle Reflex

- Sound triggers a physical response
  - May cause negative emotions

- Inborn response - occurs because of genetics
- Emotional response depends on the situation
Fingernails on Chalkboard

• Why do we hate that sound?
Fingernails on Chalkboard

- Why do we hate that sound?
- It triggers a physical response

- Inborn response - occurs because of genetics
Misophonia –

- Why do we hate a misophonia trigger?

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Trigger  elicits  Extreme Emotion and Fight-or-Flight
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Misophonia – A Physical Reflex

- Why do we hate a misophonia trigger?
- It triggers a physical response
Misophonia – A Physical Reflex

- Why do we hate a misophonia trigger?
- It triggers a physical response

- Misophonic response not present at birth
- Misophonic response is to unique stimuli

Misophonic response - occurs because of experience
Hidden Initial Physical Reflex

- Hidden because of the miso-emotions
- Some report a coping response
  - Hands on ears
  - Push the person
  - Yell
- Most report a secondary response
  - Lots of tight muscles
  - Feel hot, sweat, heart rate
- 30% report “emotion only” response
Initial Physical Reflex

- With help ~95% can identify a physical reflex
  - Skeletal muscle jerk
    - Neck, shoulders, chest, jaw, face/eyes, hand open, hand close, abs, legs, butt, feet, behind ears (and combinations)
  - Internal reflexes
    - Stomach or intestine constriction, nausea, butterflies
    - Esophagus constriction
    - Sexual/groin response
    - Urge to urinate
  - Something in chest cavity
  - Unusual responses
    - Increased heartrate, hot, burning sensation, pain
Examples of Physical Reflex

- 20 consecutive patients/individuals

<table>
<thead>
<tr>
<th></th>
<th>Example</th>
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<tbody>
<tr>
<td>1</td>
<td>none</td>
</tr>
<tr>
<td>2</td>
<td>abdomen/sphincter muscle</td>
</tr>
<tr>
<td>3</td>
<td>calves</td>
</tr>
<tr>
<td>4</td>
<td>double reflex: eye squint for crunch, neck for snoring</td>
</tr>
<tr>
<td>5</td>
<td>eyes squint</td>
</tr>
<tr>
<td>6</td>
<td>fists clinch</td>
</tr>
<tr>
<td>7</td>
<td>fists clinch, toes curl, legs</td>
</tr>
<tr>
<td>8</td>
<td>hot, heart rate</td>
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<tr>
<td>9</td>
<td>jaw</td>
</tr>
<tr>
<td>10</td>
<td>jaw</td>
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<tr>
<td>11</td>
<td>neck</td>
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<td>12</td>
<td>neck</td>
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<td>13</td>
<td>neck, shoulders</td>
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<tr>
<td>14</td>
<td>neck, upper back</td>
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<tr>
<td>15</td>
<td>not specific</td>
</tr>
<tr>
<td>16</td>
<td>pain in ear, face burning</td>
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<tr>
<td>17</td>
<td>right arm, chest, leg, foot</td>
</tr>
<tr>
<td>18</td>
<td>toes curl, thighs</td>
</tr>
<tr>
<td>19</td>
<td>vaginal/sexual</td>
</tr>
<tr>
<td>20</td>
<td>vaginal/sexual</td>
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Conditioned Reflex

- Pavlovian conditioning or classical conditioning
  - Neutral stimulus (bell)
  - Reflex response (salivation)
- Most conditioning studies
  - Stimulus-Stimulus pairing
  - Aversive stimulus (loud sound)
  - Measures physiological (emotional) response
  - Person must be aware of NS/CS
- Limited research of Stimulus-Response pairing
  - Delayed reflex study
  - Timing of NS/CS to UCR is critical

Conditioned response - occurs because of experience
Cerebrum
Thinking Brain

Limbic System
Emotional Brain

Autonomic Nervous System
Lizard Brain
Common Conditioned Reflexes

- Infant research – mother’s voice and pick up
- Infant research – smell vanilla when calm
- Smell from childhood
- Pasta response
- Drug tolerance
- Phobias
- “Thank you”
Misophonia – A Conditioned Reflex

- Unique trigger sounds for each person – experience
- A sound paired with a trigger becomes a trigger
  - Accidentally demonstrated
- In a controlled setting, the stronger the trigger, the stronger the response.
- Counterconditioning (or extinction) demonstrated
- Spontaneous Recovery demonstrated
- Individual stories
  - Carla (10-yr-old)
  - John (remembers developing his first trigger)
  - Bill and mockingbirds
  - Connor the Marine
Acquire a Misophonia Reflex

• Lizard Brain and Thinking Brain perceive stimulus
  – “Scans” body for actions
  – Are specific muscles tight or tightening?
  – Are specific muscles relaxed or relaxing?
  – Are other reflexes happening?
  – ~2 second window
  – ½ second is the most important time

• Once developed – Lizard Brain (only)
Misophonia – A Conditioned Reflex

- Conditioned reflexes are “learned” (technical)
- Misophonia is a “learned” phenomenon
- Parents DO NOT “teach” this
- Examples:
  - Mother of 4, 1 with misophonia. 2nd child developed misophonia. Her triggers (husband chewing, fingernail on tooth)
  - Friend rubbing fingers
  - Type 1, sensitive kids
  - Type 2, strong-willed kids
  - SPD kids
Alternate Explanations for Misophonia

• Unconditioned response
  – Neurological defect in upper brain
  – Different disorder than conditioning (virus vs. bacteria)
  – Implies different treatments are needed

• Form of Sensory Processing Disorder
  – Touch, taste, smell, sight, and sounds
  – Sounds – unexpected, loud

• Autism Spectrum Disorder
  – Symptoms are SPD (general heightened sensitivity)
Alternative Explanations

• Highly Sensitivity Person
  – Individual upset by continuous, loud, intrusive, or irritating sounds

• Hyperacusis
  – Response to loud sounds

• Obsessive Compulsive Disorder (OCD)
  – OCD compulsive act reduces anxiety
  – Misophonia compulsive act avoids or escapes triggers
Misophonia, A Conditioned Aversive Reflex

- Misophonia is the result of normal neurological process of a typical brain.
Emotional Response

- Research using aversive stimuli (odors, taste, heat)
  - Fight-or-flight thoughts/responses
- Pain induced aggression
- Violation of personal space
  - Trigger sound is felt physically
- Ignore sounds, but not physical contact
- Lizard Brain reflex – electrical shock
- Misophonia anger is not a choice
  - Strong reflex response – Anger from “pain”
  - Weak reflex response – Anger from “intrusion”
  - Or reflex triggers the emotional reflex response
Acquiring a Misophonia Reflex

- “Distress” – anxious, tense, stressed, angry
  - Accompanying tight muscles or other reflex

- Acquisition process #1 – feeling distress and
  - Irritating sound [noticed] → muscle flinch [unconscious]
  - Irritating sound [noticed] → muscle flinch [unconscious]
  - ...
  - Trigger [not noticed] → muscle flinch [Lizard Brain]

- Acquisition process #2 (maybe)
  - Noticed stimuli (crunch) + Tight muscles (for any reason)

- Distress + repeating sound = misophonia
Multiplying Misophonia Triggers

- Pairing trigger with neutral stimulus
  - Pairing the Miso-response with neutral stimulus
  - Turns the neutral stimulus into a trigger

- Examples
  - Jaw movement with chewing
  - Fork sound with chewing sound
  - Family chewing with Dad crunching

- Discrimination and Generalization
  - Specific Triggers – very specific sound and context
  - General Triggers – large variation stimulus and context (anyone, anywhere)
Complex Controlling Stimuli

• Generally starts with one situation/person
• Other sounds/settings are added with time
• Often selective to settings and people
  – Virginia: Crunching of granddaughter
  – Virginia: Mother chewing gum (bad), friend (good)
  – Deb: Reacts to eating sounds, but not of Chinese
  – Jack: Reacts to subtle sound differences in “crunch”
• Influenced by general mood
• Influenced by fatigue, sleep, hunger, etc.
• Context sensitive
  – Research shows, eliminate reflex in one context, still occurs in another
Eliminating a Conditioned Response

- Research on CS-UCS (stimulus-stimulus) pairing
  - CS/UCS → UCR
  - CS → CR (CR < UCR)
  - CS2 → 0.66 * CR (for Pavlov’s dogs)
  - CS3 → 0.66 * 0.66 * CR
  - CR decays exponentially

- Process is called Active or Respondent Extinction

- Breaking the CS-UCR association (trigger miso-response) seems more difficult

- Research indicates that the old neural pattern does not change – a new pattern develops
Maintaining the Misophonia Reflex

- Trigger → Reflex + emotional boost
- No emotional boost, reflex may die out
Reducing the Misophonia Reflex

• Change the trigger-response pairing
  – Lower physical reflex
  – 0-2 second “pairing” window after trigger
  – ½ second is most important

• This is counterconditioning or extinction
  – Trigger → Reflex – reduced by positive/relaxed emotion
    • Say, “No threat. Thank you.”
  – Trigger → Reflex – reduced by muscle relaxation
  – Trigger → Reflex – blocked by stronger reflex

• Problem
  – Counter-condition is rarely stronger than miso trigger response (physical and emotional)
Reducing the Misophonia Reflex

- **Trigger → Reduced Reflex (special conditions)**
  - Block or stop the reflex response
    - Esophagus constriction – swallow
    - Pillow fight
    - Tickle / stretch for sexual response
    - Gasp – scuba breathing
  - Reduce and shorten the reflex
    - Relax muscle
- **Change the context**
  - Empathy / sympathy vs. resentment
Determining the Initial Physical Reflex

- A single short soft trigger (sniff once)
  - Often too much
  - Try making sound from a distance (or another room)
- Use a recorded trigger and Misophonia Reflex Finder app
  - ¼ to ½ second
  - Barely audible
- Sometimes reflex can’t be described
  - Heart “bump”
  - Something in my chest is growing
  - Eyelid muscle, frown
  - Shovel run through my chest and out my back
Benefits of knowing your reflex

• Understand that with misophonia, your lizard brain is hurting you, not the other person.
  – It is a reflex.
• Stopping the physical reflex stops emotion
• Neural Repatterning Technique – (NRT)
  – Most have no emotion, because the stimulus is so small
  – Some have emotions and reflex with NRT (keep it low)
  – Stop the physical reflex, emotions don’t happen
• Progressive Muscle Relaxation treatment
• Calming response, “Not a threat. Thank you.”
Misophonia, A Conditioned Aversive Reflex Disorder

- How you view your misophonia
  - Is my brain defective? No!
  - Is the person attacking me? No. It is your Lizard Brain.
  - Will it help to relax and move away instead of getting mad? Yes!
Misophonia, A Conditioned Aversive Reflex Disorder

- What research questions we ask
  - What is the defect in the brain that is causing misophonia?
  - What structures are involved when the person is triggered?
Misophonia, A Conditioned Aversive Reflex Disorder

- What research questions we ask
  - Is misophonia a conditioned physical reflex disorder?
  - How do we change that reflex?
  - How do we prevent the typical advancement of misophonia?
Misophonia, A Conditioned Aversive Reflex Disorder

- How we provide treatment
  - Exposure to triggers 😞
    - Do not give in to child demands
    - Keep the child at dining table
  - Exposure and response prevention 😞
  - Reduce the physical reflex 😊
  - Change the response to the physical reflex 😊
Thank you!

Misophonia Treatment Institute
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