



# Misophonia, A Conditioned Aversive Reflex Disorder

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# Reflex

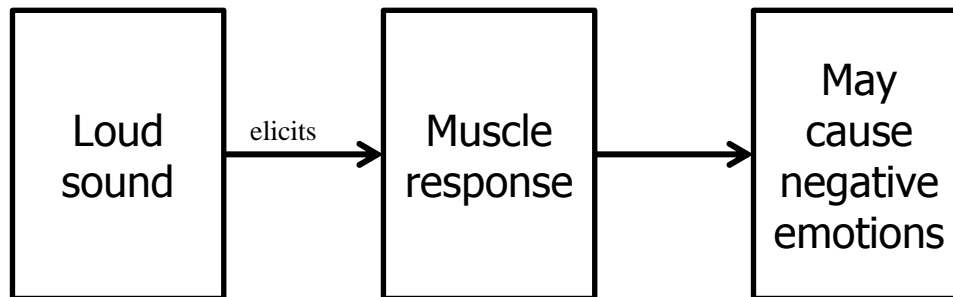
- Stimulus → Response
- Automatic / involuntary response
- Types of reflexes
  - Innate / inborn / unconditioned (100% genetics)
  - Acquired / conditioned reflex (experience)

# 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



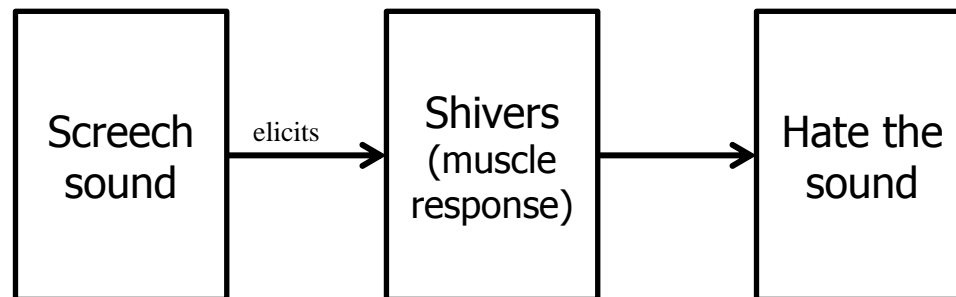
- Inborn response - occurs because of genetics
- Emotional response depends on the situation

# 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

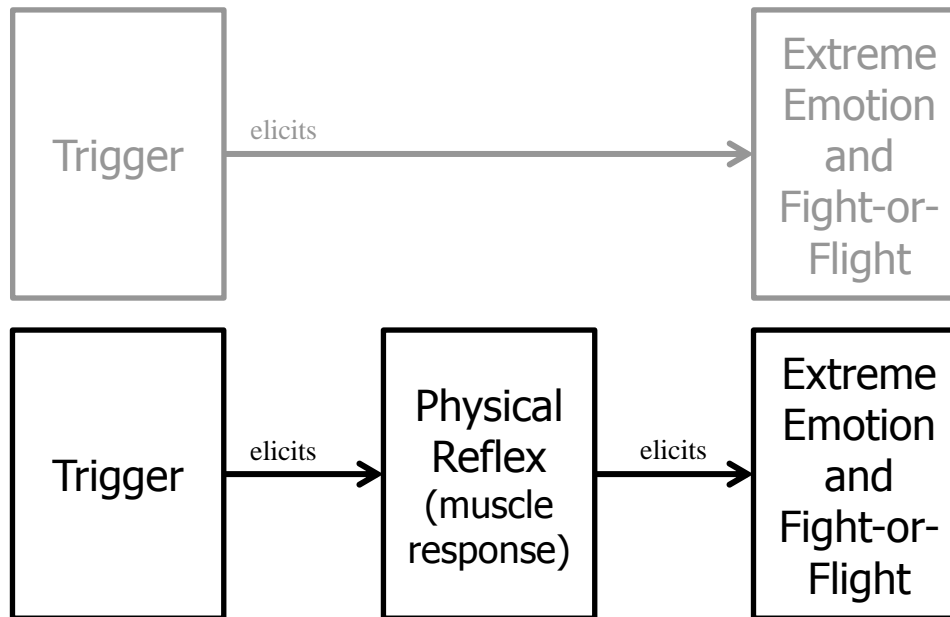
# Misophonia –

- Why do we hate a misophonia trigger?



# Misophonia – A Physical Reflex

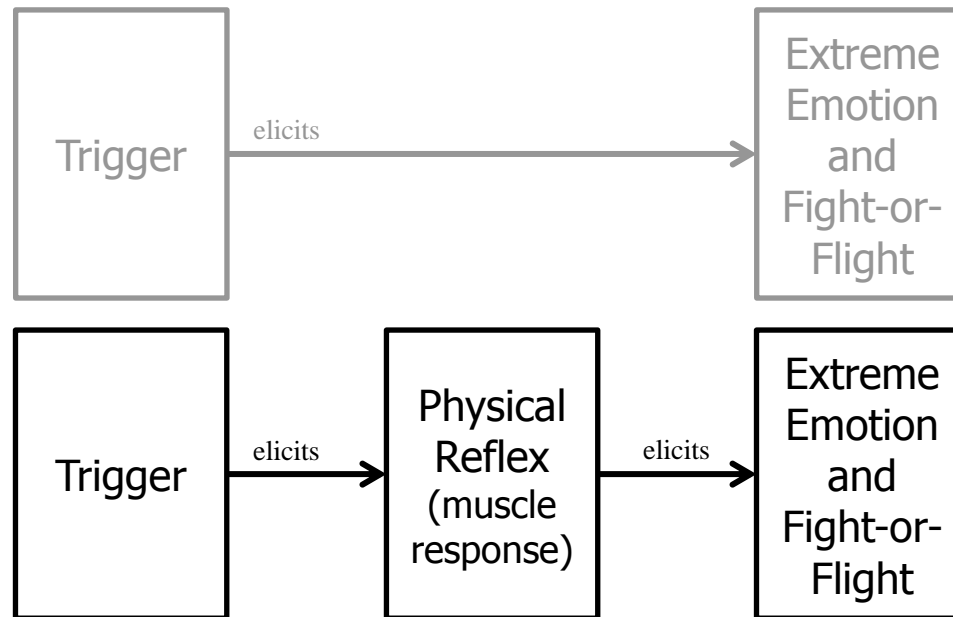
- Why do we hate a misophonia trigger?
- It triggers a physical response





# 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

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

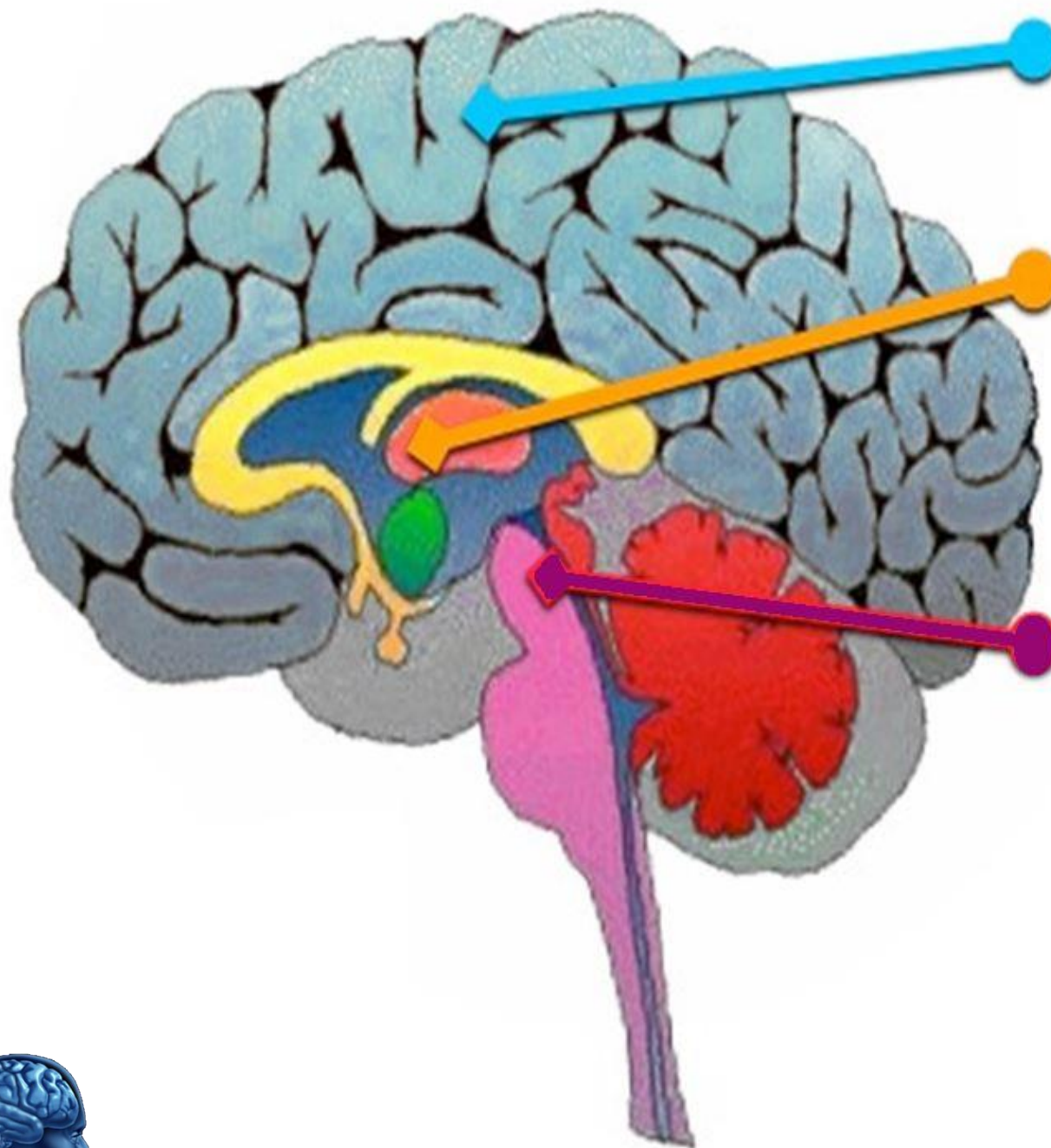


# Conditioned Reflex

- 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
  - 1/2 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. 2<sup>nd</sup> child developed misophonia. Her triggers (husband chewing, fingernail on tooth)
  - Friend rubbing fingers
  - Type 1, sensitive kids
  - Type 2, strong-willed kids
  - SPD kids

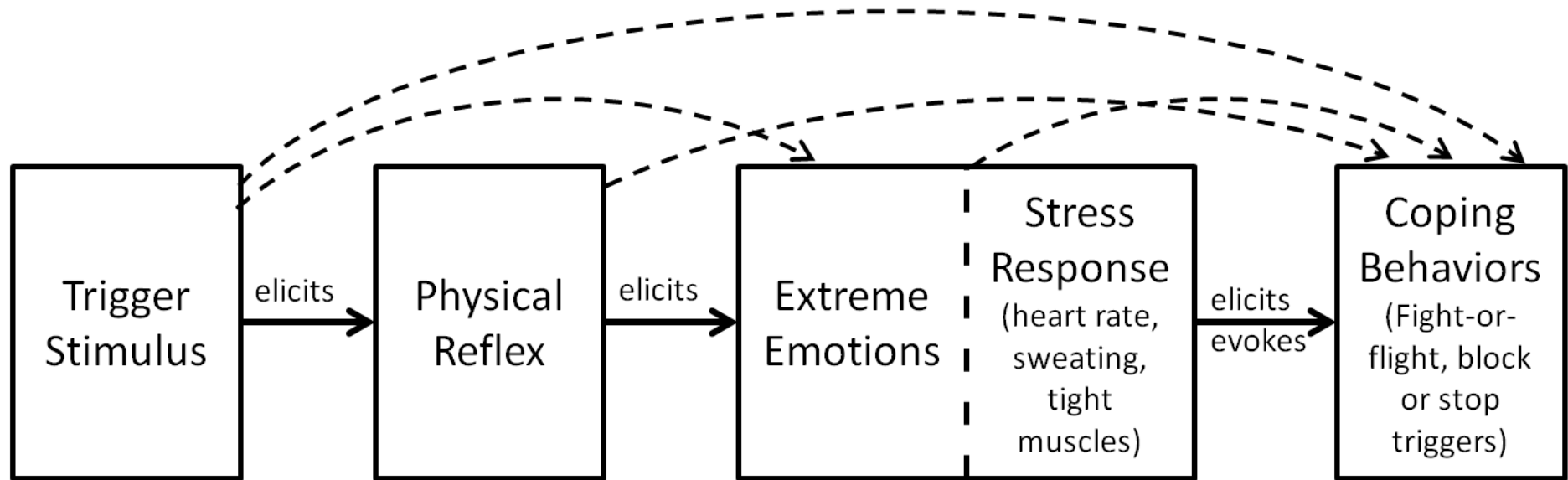
# Alternate Explanations for Misophonia

- 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
  - 1/4 to 1/2 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



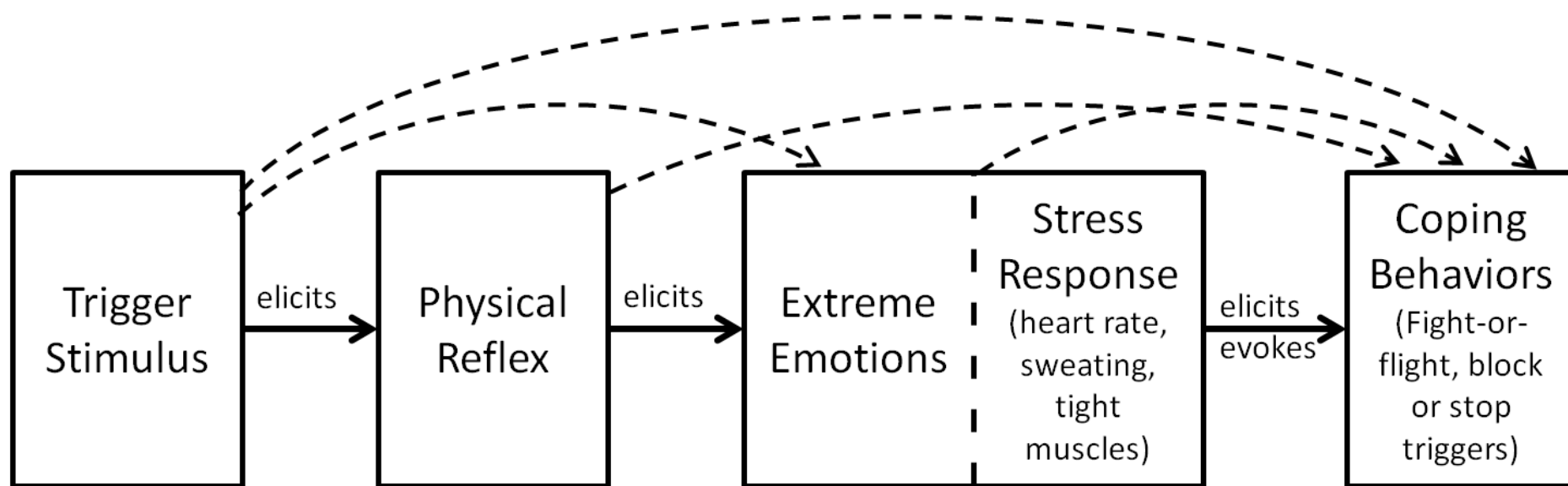
# Benefits of knowing your reflex

- 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.”



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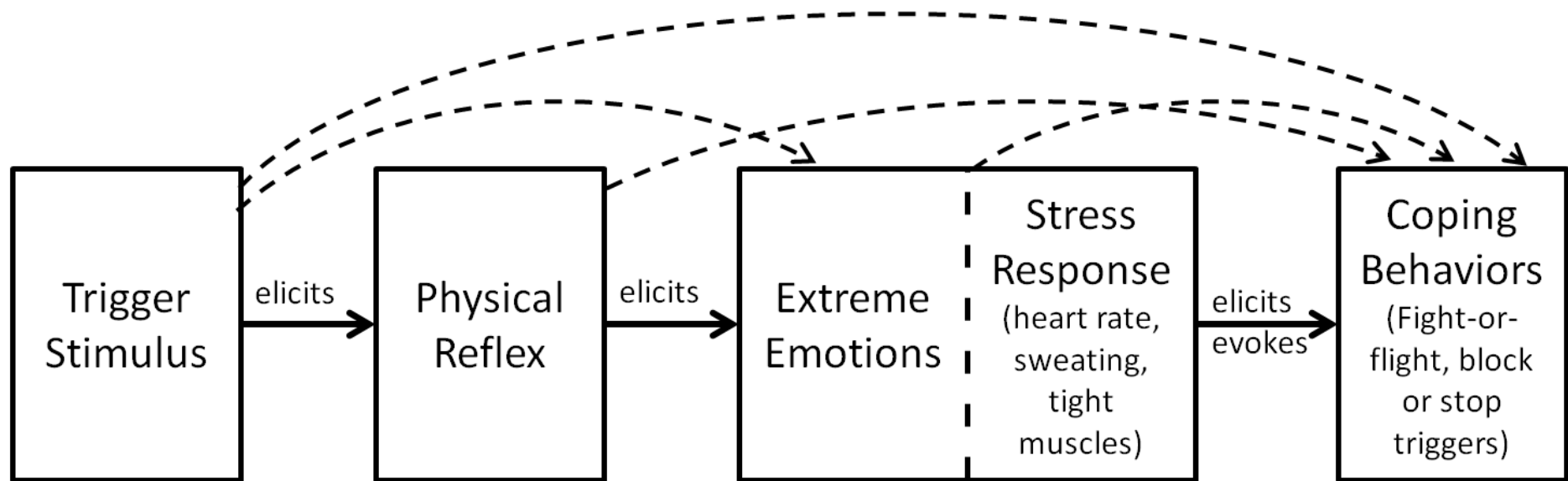
- How you view your misophonia
  - Is my brain defective? No!
  - Is the person attacking me? No. It is your Lizard Brain.
  - Will it help to relax and move away instead of getting mad? Yes!





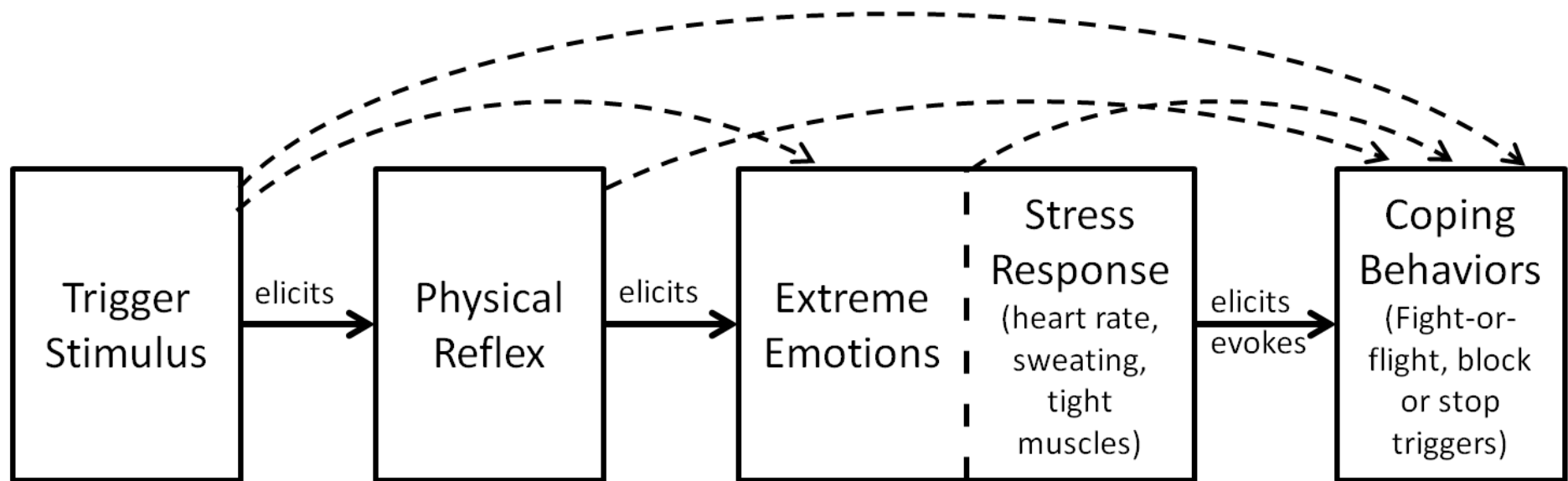
# Misophonia, A Conditioned Aversive Reflex Disorder

- 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?



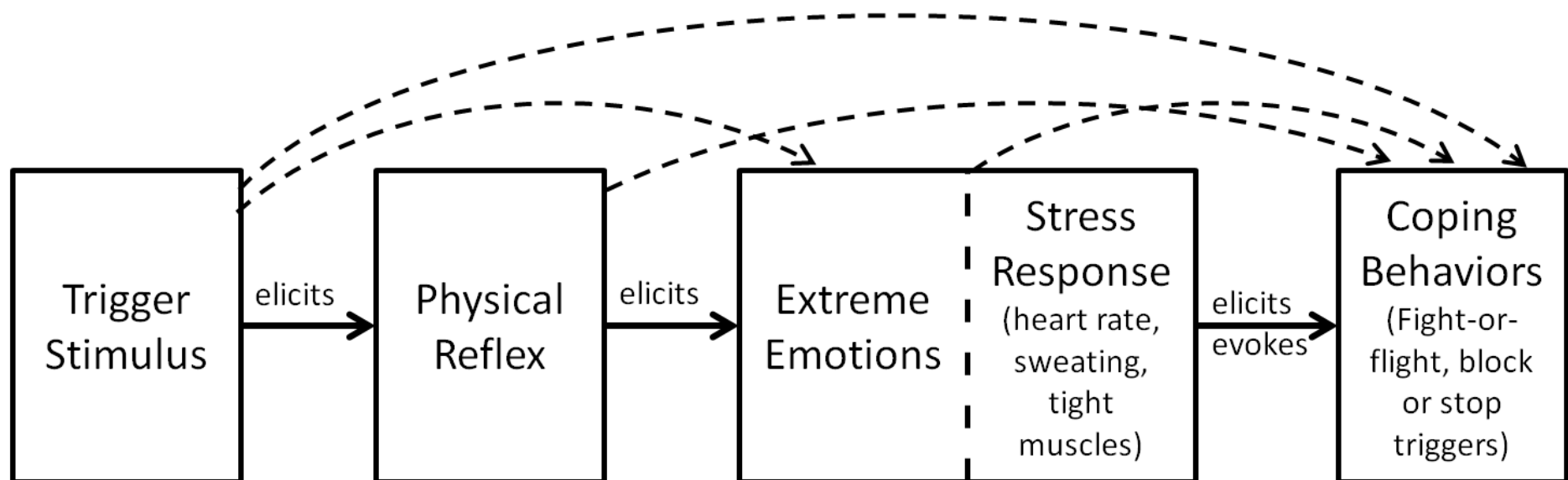
# Misophonia, A Conditioned Aversive Reflex Disorder

- 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  
**[www.MisophoniaTreatment.com](http://www.MisophoniaTreatment.com)**



- Education
- Misophonia Awareness
- Research
- Development of Treatments

