SOUND SENSITIVITY: AUDITORY ABERRATIONS FROM ARISTOTLE TO LEVITAN

Natan Bauman, EdD, MS-Eng
New England Tinnitus and Hyperacusis Clinic

Volume-Intensity-Loudness *

- **Volume** – no defined physical measurement in terms of SPL, etc. Volume is the level at which something is heard, colloquial way of describing sound

- **Intensity** – is defined as the sound power per unit area (W/m^2) or as a physical measure of sound in dBs. It is an objective measurement.

- **Loudness** – is subjective evaluation of presence of sound. It is governed not only by the physical characteristics of sound but also by many factors related to the listener/observer.

Sound Sensitivity Disorders (SSD) *

Several loudness sensitivity disorders are recognized

- Recruitment
- Hyperacusis
- Phonophobia
- TTTS
- Acoustic Shock
- Mal de débarquement syndrome (MdDS, or disembarkment syndrome)
- Misophonia

Recruitment

- Compressed Dynamic Range of Hearing
- Rapid growth of loudness with increase in intensity, disproportional to the increase of intensity
- This phenomenon occurs because at some decibel level, the normal hair cells adjacent to the damaged hair cells (corresponding to the frequency of a hearing loss) are "recruited." At the decibel level at which these normal hair cells "kick in," perceived loudness shoots up rapidly, causing discomfort.
- Often referred to as a "collapsed dynamic range" of hearing.

Recruitment

Recruitment = rapid growth of loudness with an increase in intensity

Example: SNHL of, lets say 50 to 60dB. You speak at a normal conversational level of 50dB HL - no response. So you speak at 60dB HL still no response. You go up few more dBs

The response: ***"STOP yelling so loud!"***

Hyperacusis

- Abnormally strong reactions occurring within the auditory pathways resulting from exposure to moderate levels of sound (involving significant over-amplification within the auditory system).
- Patients express reduced tolerance to suprathreshold sounds (less than 70 to 90 dB)
- The reaction is to the physical characteristics of sound INTENSITY
- Hyperacusis = escalated growth of **loudness** with increase in intensity

Hyperacusis *

- Normal sounds seem amplified, as if someone has turned up the gain of the ear. Often we describe hyperacusis as an auditory oversensitivity to sound of even low volume.
- People who suffer from hyperacusis find even soft sounds to be too loud, medium loud or slightly louder sounds being extremely uncomfortably loud and very loud sounds extremely intolerable!
- It is not correlated with any specific sound

TTTS

- In some who suffer from ***hyperacusis***, an involuntary activity can develop in the tensor tympani muscle. This activity is part of the protective and startle response to loud sounds. This increased, reflex threshold for tensor tympani contraction can also be activated without the presence of a sound by just an anticipation (anticipation network) of an unexpected, and perceived to be harmful sound.
- When the tensor tympani contracts without the presence of a physically loud sound, it is referred to as **Tonic Tensor Tympani Syndrome (TTTS).**
-

TTTS
It is not the thing, it is the thinking

- It appears that in some people with hyperacusis, the Tensor Tympani muscle can contract just by "**thinking**" about a loud sound.

- "Virtual Trigger, an ill-conceived preventative function"

- TTTS = Rapid growth of perceived and anticipated loudness with or without increase or presence of a sound.

Acoustic Shock

- During the exposure, most people will experience discomfort and pain.
- A few minutes after the exposure, some people might experience shock, nausea and anxiety.
- Headache, fatigue, hypersensitivity to loud noise and tinnitus may continue for days, weeks or indefinitely.

Mal de Debarquement

- Mal de debarquement syndrome (MdDS) is a rare and not well understood disorder of the body's balance system in conjunction with the ANS and refers to the rocking sensation and/or sense of imbalance that persists for an excessive length of time after an ocean cruise, plane flight or other motion experience.
- Most people after exposure to an ocean trip or long airplane ride will experience "motion" after the event is over and for a short period of time, with two days being the upper limit of normal.
- But for persons with MdDS, these sensations may last for 1 month or a year or even many years. Symptoms may diminish in time or periodically disappear and reappear after days, months, or years, sometimes after another motion experience or sometimes spontaneously.
- In addition to the balance disturbance people experience an over sensitivity to sounds which can persist from few days to few months.
- All of the MdDS symptoms may be an over-reaction from the Limbic System triggered by the initial auditory/vestibular disturbance

Phonophobia

Abnormally strong reactions of the Autonomic and Limbic Systems without physiological, abnormally high activation of the auditory systems (but not involving significant over-amplification within the auditory system?)

Patients are afraid/scared (F/F) of sound.

- Role of the Limbic System (inate startle reflex)
- Learned conditioned response
- Loud means "BIG and NEAR"
- Soft means "SMALL and FAR"
- Seeking out sounds – "SCANNING for SOUNDS" – OVERVIGILANCE
- Predicting and anticipating

Phonophobia = Rapid growth of perceived loudness with increase in intensity or just the presence of sound driven by fear

Phonophobia
It is not the THING; it is the THINKING

- Abnormally strong reactions of the Autonomic and Limbic Systems without physiological abnormally, high activation of the auditory systems (but not involving significant over-amplification within the auditory system?)

  Patients are afraid/scared (F/F) of sound.

- **No physical sound explanation for the abnormal behavior to sound**

But what if we have both?

Physiology of Loudness

- Joseph LeDoux and Fabio Bordi found that cells in amygdala are able to determine the intensity or loudness of a sound through the thalamic pathway (1992).
- Loudness is a good clue to how close something is, and distance is a good clue how dangerous that thing is. If you treat loud things as dangerous you are probably safer than if you were to ignore it.
- Therefore, when computing intensity from thalamus, the amygdala can immediately deduce critical details about the stimulus.
- Which in turn provokes fear and an ANS reaction

Establishing LCRs

- Pairing neutral sounds with perceived dangerous or real dangerous stimulus are responsible for neural responses which precede the development of conditioned fear behavior, suggesting that the neural changes might well be responsible for the behavioral learning.

- Studies have shown that lateral amygdala is the key site of plasticity during fear learning.

MISO PHONIA

Misophonia

- "Recognizing this specific situation of negative reactions to specific sounds, the concept of misophonia was introduced in 2001 (Jastreboff, M.M., Jastreboff, P.J. Hyperacusis. Audiology On-line, 6-18-2001)
- Since there was no name to describe this phenomenon from the list Greek world "miso" - strong dislike or hate was selected to create term misophonia.
- The use of the term is presently a recognized term for the symptoms that people experience with regard to auditory stimuli or 'triggers' that result in negative behavior reactions.

Misophonia

- Misophonia, therefore refers to an adverse behavioral manifestation (fight or flight) to a specific auditory event or events. It is considered to be an auditory symptom, but yet, it is not related to auditory pathways; at least not related to the peripheral auditory mechanism? (J.P.)

Misophonia vs. Hyperacusis
It is not the THING; it is the THINKING

- Misophonic sounds inadvertently carry some form of information.

- It is, therefore, the content and not necessarily the physical characteristics of the psychoacoustics of the sound, which evoke/provoke the misophonic reaction. (not the V & P)

- In contrast, in hyperacusis, the "provocateur" is the sound with its physical properties (V & P)

Misophonia vs. Hyperacusis *
It is not the THING; it is the THINKING

- In misophonia the "provocateur" is the Context and Content (C&C) accompanying the sound. It is the association which is made between the sound and what the misophonic "knows", consciously and subconsciously, what it is/means.

- It is the association (pairing) made between the offensive sound and its meaning, C&C, which governs the misophonic reaction.

- The raw unmodified reaction of the amygdala as it communicates this information to the sympathetic pathways of the ANS provokes an uncontrollable misophonic REACTION/S

Misophonia

Question: what is misophonia? Rapid growth of perceived loudness associated with fear with involvement of the emotional system **without** an increase in intensity

- *Question:* what is the trigger?
- *Question:* why is the trigger trigger?
- *Question:* when does it happen?
- *Question :* where (ears or between the ears)?
- *Question:* why; softwired? (learned Pavlovian response "new drooling"; LCR)?
- *Question:* why; hardwired?
- *Question:* how to treat?

It is not the THING; it is the THINKING

Why a child cries?

- It is a form of expressing frustration
- It is a way of letting the outside world know that something is wrong
- It's the inability to express in words how we really feel
- A form of expression of "internal pain", internal torment
- It is not as much as how it hurts but the frustration of not being able to deal with it.
- It's a **REACTION** ("how high do I jump?")
- It's a REACTION provoking REACTION resulting in an **OVERREACTION**

Are we all Miso something?

- The answer is YES! Have you got buttons?
- Why and what is responsible for **it**?
- We have our own individualized "custom tailored" triggers.
- MEMORY - what we know what it is or what we think it is and what we think it is that's what we know it is (hippocampus/LS) (every one has his/her own truth)
  - what I (ID) knows about **it**
  - how it interprets, what it "really means", its perception of it, what it represents
  - how much it is afraid of it and
  - how fast needs to "run" from it or how high to jump; reflex
  - and finally, what and how it/I can manage this (do I need to **"CRY"** or can I resolve it)
- "Primal Cry"- Misophonia?

What is the difference between an average MISOsomething vs a MISOPHONIC?

- REACTION VS RESPONSE

- Strength of reaction (modified by…)
- "How high do we jump"

Misophonia

- It represents LCR, over preoccupation ,over attention and over reaction to a given stimulus/i – **AN AUDITORY OVERVIGILANCE to particular sounds**
- Therefore, it necessitates automatic engagement of the LS and ANS (sympathetic branch) and other excitatory brain/brainstem structures
- It results in a spontaneous, aberrant, hostile behavioral manifestation (fight or flight) to a specific auditory event or events.
- Is it an auditory symptom? **YES!!!**
- Is it related to auditory pathways? **YES!!!**
- Is it related to other non auditory brain structures? **YES!!!**

Misophonia

- Misophonic behavior is present (almost by definition) in all patients with clinically significant hyperacusis, but the converse is not true.
- **There is an increased gain to sounds; not all but some.**
- **Hyperacusis is present in all misophonia patients but misophonia is not present in all hyperacusis patients (P.J.)**
- **Phonophobia is present in all misophonia patients but not all with phonophobia have misophonia.**
- **There is phobia to sounds, not all but some. (N.B.)**

Misophonia

- Typically onset occurs in childhood, often around pre-puberty, with sudden onset and significant impact on everyday living activities.
- Sound sensitivities are most frequently related to "mouth" noises
- Other sounds; pen clicking, rustling paper, typewriter sounds, etc.

Most Common Triggers (Auditory)

- Chewing
- Crunching
- Gum chewing
- Smacking
- Licking
- Breathing
- Speaking
- Pen clicking
- Repetitive sounds

Evaluation

1. Audiological evaluation consists of

a. full audiometric assessment; pure tone air/bone conduction testing
b. speech testing; SRT and word recognition
c. evaluation of pure tone MCL and LDL (250, 500, 1k, 2k, 3k, 4k, 6k and 8k Hz)
d. evaluation of speech MCL and LDL.
e. tympanometry?
f. otoacoustic emission, distortion product?
g. LDLs is significant in terms of dx (for PTs and speech)

2. Mental health evaluation

Types of Triggers

- Auditory
- Visual
- Tactile?
- Olfactory?
- Virtual

"Virtual Trigger"= Anticipation

- Anticipatory Reactions (sensory modality triggers are not present yet, but…)
- "I know it is coming"
- Prior experience; pre-situation provokes anxiety/reaction, preparedness of the "misophonia system" to be ready (LCR) and
- "Auditory tuning" (where is Waldo principle)
- "Sensory cleansing" of the auditory and not auditory perceptional landscape

- "Set up" of all centers to be ready for action or should we say **OVER-ACTION**

Auditory Stations

Recognizing auditory "stations" which influence gain/sensitivity of the auditory system

1. Middle ear muscles (remember TTTS)
2. Cochlea (remember T, H)
3. Auditory CNS (remember T, H and TTTS)
4. Auditory cortex (remember T, H, PH, TTTS)

Non-Auditory Stations *

Recognizing non auditory "stations" which influence gain/sensitivity/loudness perception of the auditory system

1. Limbic System (T, H, PH, TTTS, M)
   a) Amygdala
   b) Hippocampus
2. Autonomic Nervous System (T, H, PH, TTTS)
3. Reticular Formation (T, H, PH, TTTS, M)
4. Nucleus Accumbens (T, FEAR, M)
5. Frontal Lobes (T, H, PH, TTTS, M)
6. Mind/Perception (cognitive components) (T, H, PH, TTTS, M)

Role of RF

- An innate role in "increasing gain" to IMPORTANT or PERCEIVED to be important events (e.g., pupils)
- Directed by amygdala and SNS
- Executed by RF nuclei and projections
- Send back to LS hippocampus
- And so on (installation of VC or PC, attenuates or increases gain)

Role of RF

- Therefore, the engagement of the LS+ANS which amplifies sounds from a loudness perception point of view, is responsible for reinforcement of the auditory "freighting/fear memory" loops to those sounds.

- It is evident that the involvement of the Limbic System (LS) together with the Autonomic Nervous System (ANS) must play a significant role in helping to maintain misophonic loops.

- Role of attention network (tuning and "finding Waldo")

Taming the Limbic System *

- Information from amygdala is fed to frontal cortex to produce conscious feelings while conscious awareness/knowledge is fed from FL to amygdala in a continuous loop (who is the CEO/king?; "King and I", King and Id")
- Left frontal lobe (LFL) is associated with positive feelings and action
- Right frontal lobe (RFL) is associated with negative feelings, withdrawal and passive behavior

The effect of emotions on thoughts is

***stronger than vice versa*,**

probably because
tracks carrying signals

from LS to FL than back from to LS

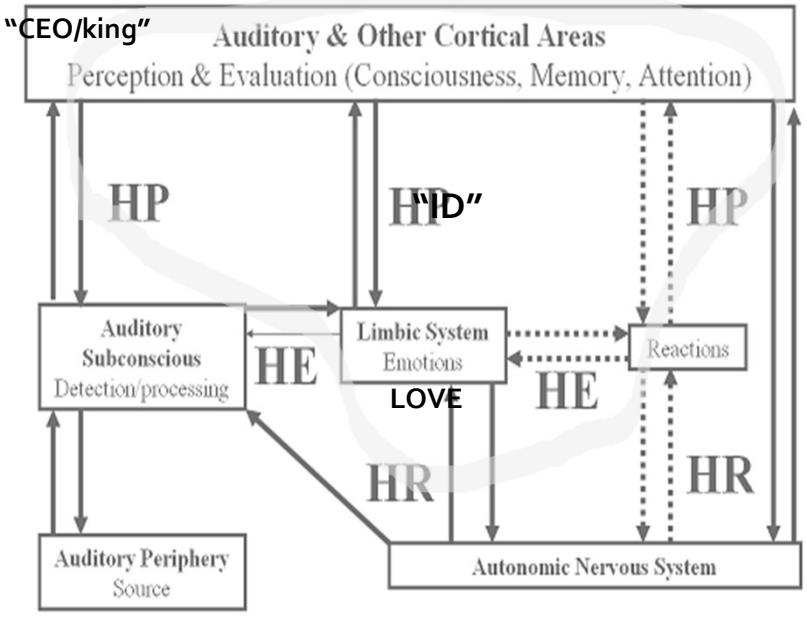
LOVE or BRAIN

or LOVE & BRAIN or BRAIN & LOVE?

Or…because our survival is more

important than thoughts?

Tag of war between "LOVE and REASON"



Taming the Limbic System

- During a "misophonia attack" people overreact to fearful thoughts

"I cannot take it anymore" (RpFL; cognitive distortion, LpFL is shut off; negative labeling)

- Input from pLs to LS becomes very negative and FEAR rules; MLCR is installed

- There is none or not sufficient positive input to amygdala to modify the emotional LS reaction; and its interaction with PNS is deactivated

- And only SNS is activated!!!

Taming the Limbic System

- Since the amygdala is responsible for fear and aggression ,then fear leads to aggression
- The frontal cortex is also responsible for socially appropriate behavior and action
- The frontal cortex can inhibit LS from inappropriate social behavior; it forces the LS into submission and thus appropriates good manners
- Just as the brain can learn new facts, LS can learn new emotions!!!!

Role of neuroplasticity *

- Rewiring old circuits and replacing them with new one (become an electrician)
- Connecting to disconnect networks
- Role of CBT
- Establishing new connections

Help with rewiring

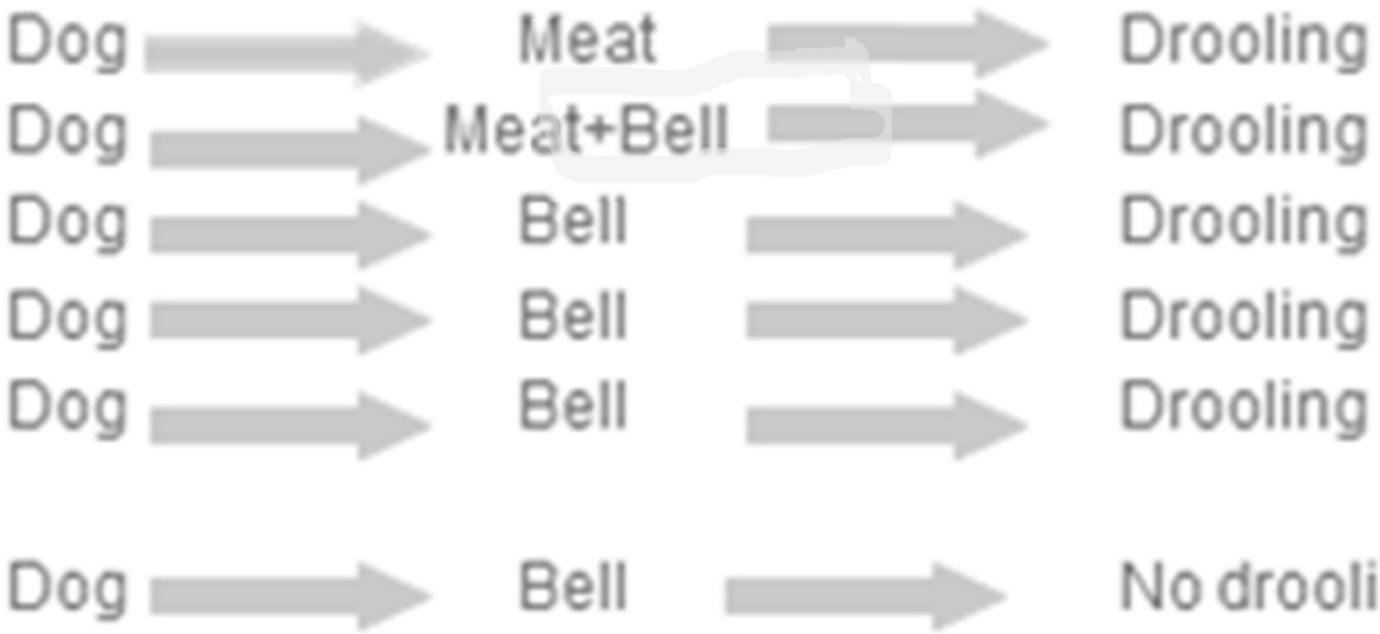
- Ellen Langer said "One can not work through his own deep-seated personal conflict" (such as misophonia).

- One needs to make the processing thoughts CONSCIOUS. "However, such thoughts will not, on their own occur to the person for reconsideration" says Ellen Langer in her book Mindfulness.

- She continues "In that way, they too are inaccessible." However, further she says "But if we offer a new door or a new view of (the conflict), we can erase the old mindset without difficulty."

Pavlovian Dog Rewiring

Association (- or +)



ICR$_{ICR}$

x **Barking/biting**
Kicking/screamir

LCR

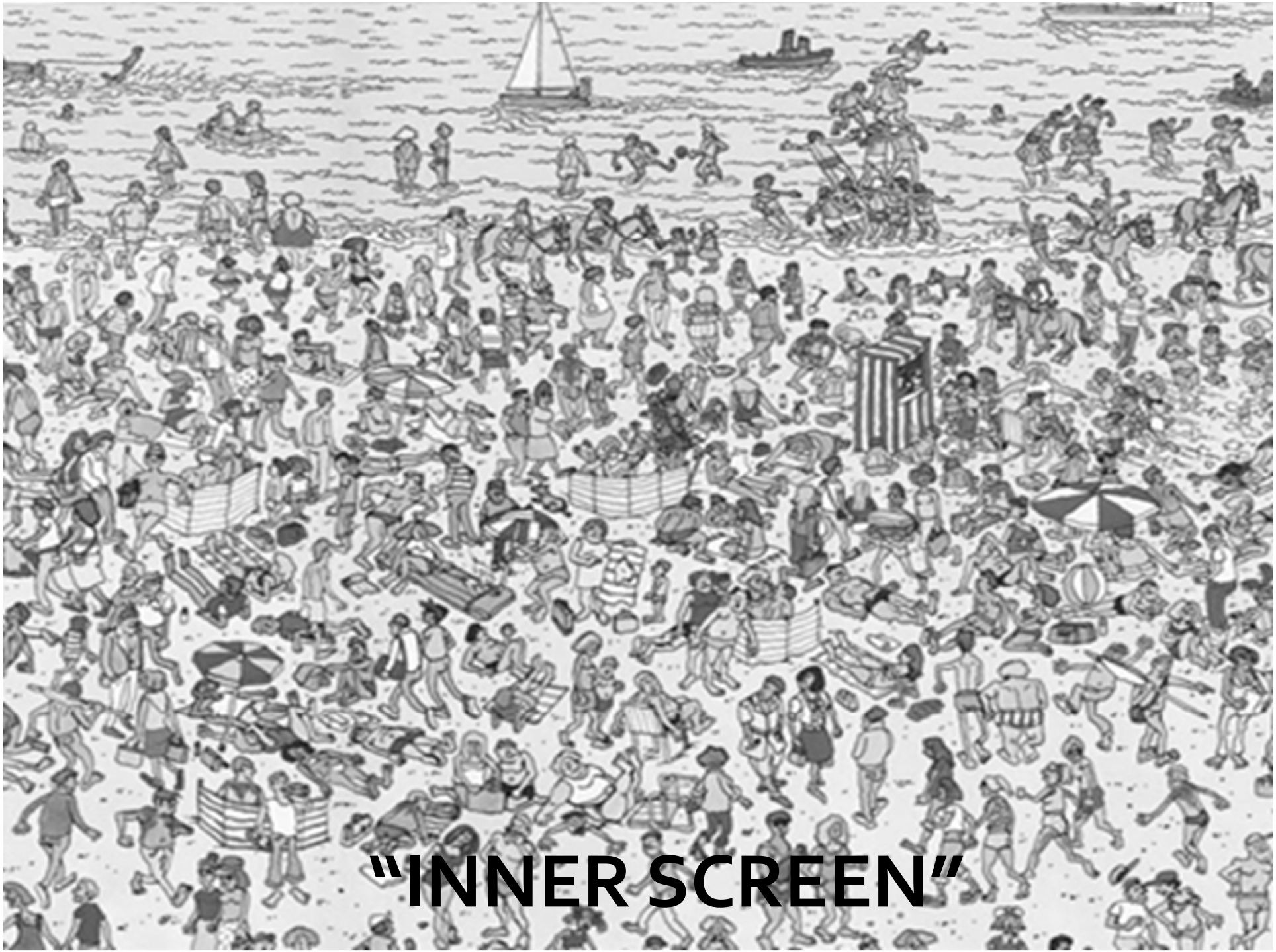
No Barking/biting
No Kicking/screaming

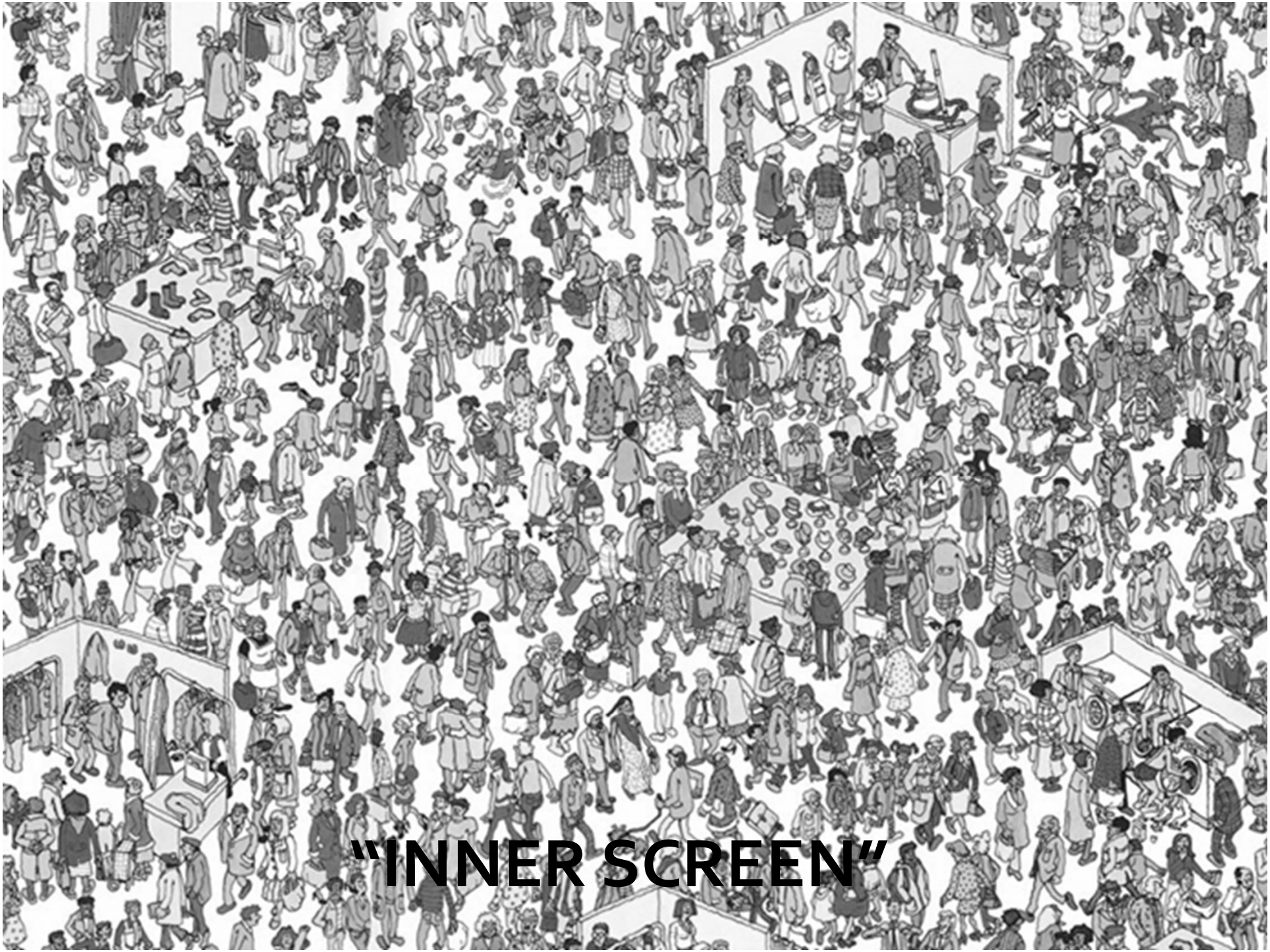
ICR

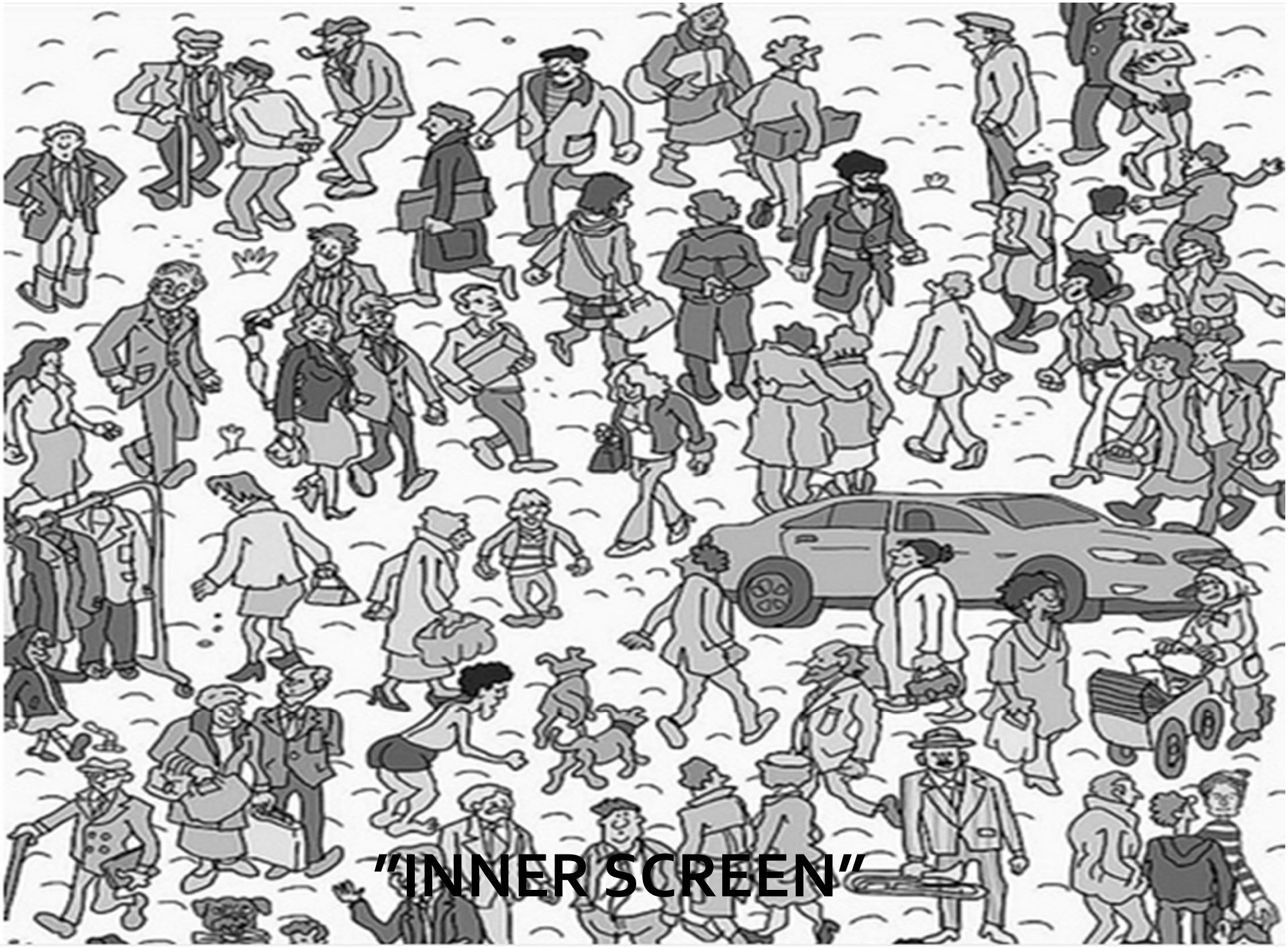
Change association – stops drooling

"Inner Screen" Principle *
Were is Waldo?

- Radio tuning to a "station"
- Brain tuning to a "station"
- And at the same time de-tuning, erasing all other "stations"


“INNER SCREEN”


“INNER SCREEN”


"INNER SCREEN"

“INNER SCREEN”

“INNER SCREEN”

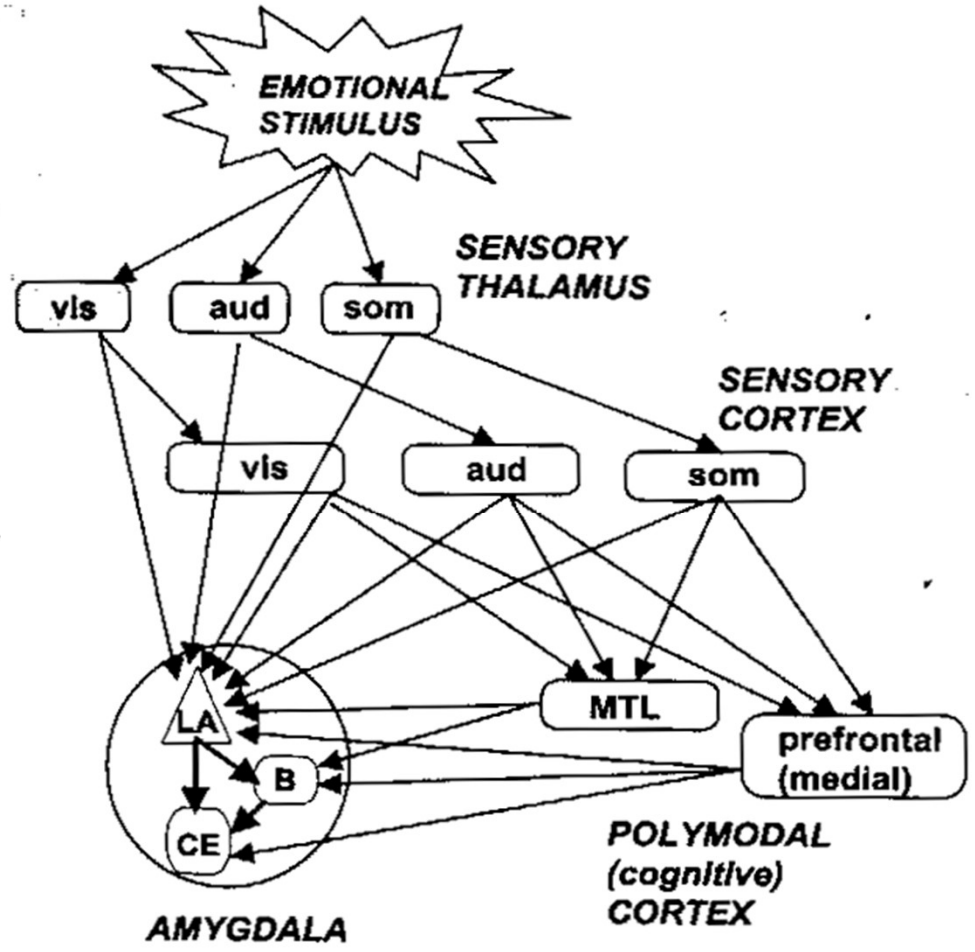
Snake in the Forest

Imagine you are walking through a forest. You are relaxed and you enjoy the beauty and the sounds of the nature. Suddenly your friend tells you he thinks he saw a snake.

Now an image of a snake crawling in the grass and possibly attacking you triggers your limbic system and your cognitive brain. You become edgy, **fearful,** anxious, tensed and your "reticular formation" becomes "**tuned**" to the very **soft sound** of hissing. Your ANS got engaged. Your heart is pounding, your hands are sweating, you start walking faster to leave the forest. You are not thinking your are reacting. **But what if you can not leave the forest. You are trapped in this forest and the hissing becomes a real sound. You are trapped.**

You "scream and kick". Although you never saw the real snake you reacted anxiously solely based on your "appraisal" of the imaginary situation. Although you have not yet heard the trigger sound you become anxious and ready to "act".

Information Flow to Amygdala

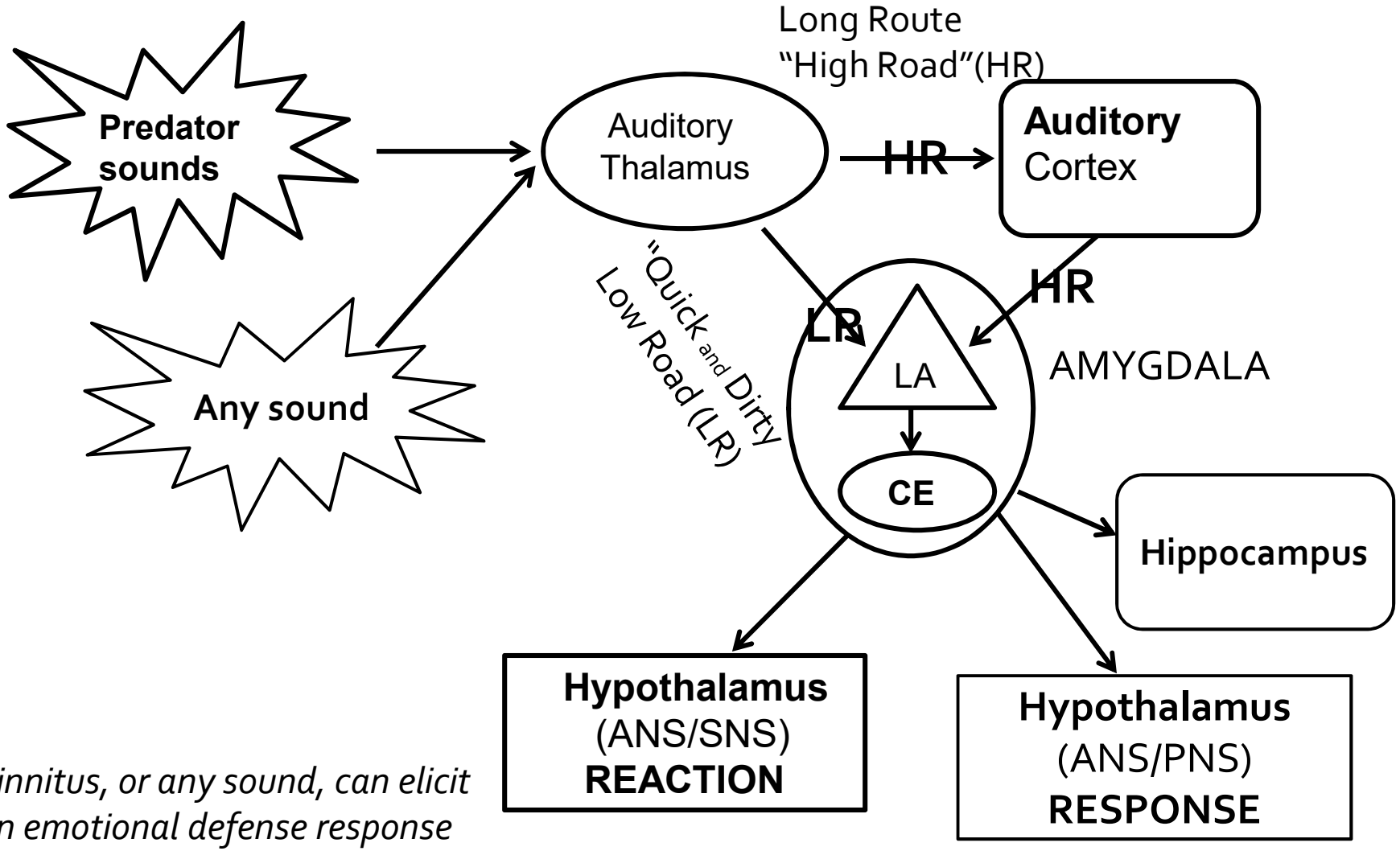


INFORMATION FLOW TO THE AMYGDALA

MTL-Medial temporal Lobe memory system
LA- Lateral Amygdala
CE- Central Amygdala
B-Basal Amygdala

Joseph LeDoux, Synaptic Self, 2002

Misophonia Pathways "The Two Roads"



Tinnitus, or any sound, can elicit an emotional defense response through the Amygdala and subsequent reaction through ANS

Snake in the Forest

- First pathway (1st and shorter) emerges also from the thalamus.
- Conditioned fear appears to be formed out of information that takes this short cut – survival path
- A set of physical characteristics of a sound/s (pitch, volume, intonation, etc.) becomes associated with snake/chewing (LCR)

Snake in the Forest

- Second pathway (2nd and longer) goes to the auditory cortex which analyzes it and than sends on what it finds. At this stage it is just information – a neuronal pattern.
- Next, the recognition areas of the brain start to process it to decide what the neuronal pattern is all about. Here, it is recognized as a snake/chewing which triggers the stored knowledge about snakes/chewing (building of the misophonia infrastructure).
- This knowledge will be sitting in the long-term memory storage. This processed information produces an alarming signal of a "dangerous event". This in turn is sent back to the amygdala which engages the ANS for action.

Reaction vs. Response *

- Is misophonic physical, verbal manifestation
  a) a response to trigger or
  b) is it a reaction to trigger?

- Defining reaction; "Low Quick and Dirty Road"

- Defining response " High Road, slow but thorough"

- Modifying Low Road reaction with "High Road" input to amygdala

- Replacing SNS with PNS changes reaction to a response

Reaction vs. Response

- So if there is no input from the "High Road"

- Or, the input from HR is not getting through

- Or, if the input from the HR is not as what normally is expected,

Then:

- Unmodified entry from the Low Road resides in the prefrontal lobes
- Or, negatively modified/reinforced resides in the PLs driven by LS

From Aristotle Categorization Theory

- As described by Aristotle we assign sensory perceived items/events to various categories based on previous analysis/knowledge of their properties and comparison analysis performed in the working memory.

- According to Aristotle categories are clearly defined and they have boundaries which allocate each confined set of information into a memory compartment specifically preset for processing learned, say, misophonia psychoacoustical set (C & C) of characteristics.

- "The Will"

Aristotle and others

- If we extend Aristotle's categorization theory to more contemporary times, we recognize that such rigid categorization proposed by Aristotle has been expended by Eleanor Rosch and Roger Shepard who proposed that such categories are not as rigidly defined, and, as **Shepard suggested; they are evolutionary**.

Shepard's Categorization

- Shepard in his three scenarios of categorization says that in order to survive we need to: find food, to escape from predators and to mate (4Fs)
- Categories can overlap and same meaning or the same set of psychoacoustical parameters do not have to belong to the same category. For example, the same set of acoustic information such as chewing may not belong to one category. One person's chewing does not have to belong to the same category as another person's chewing.
- We can, therefore, explain why a misophonic person will accept one person chewing while another person chewing may provoke a very strong "fight or flight" reaction.

To Daniel Levitin Record Keeping Theory

- According to **Daniel Levitin** (***This is Your Brain on Music***, 2006) we automatically recognize many voices/sounds.
- We recognize the sound of your friend's voice, spouses' voice, or if she is angry or happy from the timber of her voice.
- We can also recognize many known voices of know personalities (Richard Nixon, Steve Martin, John Wayne, Bill Clinton).
- Just an utterance of their voice or a phrase, a whisper or a lip smack, or a small chewing sound recalls an image and the rest of the phrase (for example "Go ahead, make ……, "I never had….) because when we store in our memories the auditory image we also store the content and the context of the message and associated auditory "landscape"
- Storing auditory events is not just storing its psychoacoustic parameters of the sound information (not like a camera taking a picture),
- We store the context and content (C & C) associated with the physical characteristics of the sound
- We just "know" what it is and who it comes from

Record Keeping Theory

- This supports of what is referred to as "The Record Keeping" theory.
- Therefore, such record keeping can be conceived in misophonia where there is a distinct "cataloging" of the adversary sounds.
- In addition, we recall not only the "image" of a sound but also the "image" of the person, of a circumstance related to the sound as well as the contextual (C & C) information associated with it.
- Thus, it is not just the sound which is the adversary but all of the other associated information stored and recalled which come as a whole triggering gestalt.

Record Keeping Theory

- When we recalled such an event we recall the physical aspect of it and the emotional aspect of such an auditory event.
- We subsequently restore each such occurrence but not the way we recalled it. We restore it with an added negativity if such event is again perceived as a predator like event.
- And again, the physical sound and associated emotional content triggers an additional reinforced negative reaction to such a sound.
- Therefore, just a "small note" of the misophonic sound triggers a memory recall of the adversary auditory event which snowballs causing a "avalanching" like misophonic reaction.

From Record Keeping to Categorization

- In order for this to happen we have to have some sort of stored memory trace for the timber of the person's voice something that would trigger a certain category

- In addition to such auditory categorization, it is also not too uncommon, to exhibit a visual categorization.

- In which case, a visual representation of a given object becomes associated with a known and expected auditory concept and both may trigger a very strongly defined categorization and reaction to what is being perceived as a predator like event.

Limbic System and the Working Memory

- Limbic system is directly connected to the working memory as it needs to assess the "value" of the incoming information (directs and redirects)
- Split second decisions are process between the short memory storage and the long memory storage in what is referred to as a working memory.
- Filtering of auditory input occurs in our working memory.
- On the other hand, information which is perceived as important, information which is new and not processed previously, receives "preferential treatment" and is sent for storage and later recall, from the long memory storage.
- Working memory plays, therefore, a vey important role in the process of Record Keeping and Categorization

Misophonic music

- As with music, where the composer intentionally builds up the combination of notes to create excitement and anticipation of a fury of incoming music, and our emotional state reaches a crescendo, before such occurs, a state of "negative excitement" and anticipation of "notes" is reached.

- This can be compared to our misophonia patients where such events create a high level of an emotional upheaval in anticipation of a misophonia sound/s.

- And, when such trigger occurs there is an "crescendo" of an emotional reaction

Is misophonia an over reactive nerve firing such as in Fibromyalgia?

- F - a heightened and painful response to pressure.
- F - is a central nervous system disorder,
- F - is described as a 'central sensitization syndrome' caused by neurobiological abnormalities which act to produce physiological pain and cognitive impairments as well as neuro-psychological symptomatology.
- Abnormal pain response - areas in the brain that are responsible for pain may react differently in fibromyalgia patients

Research Efforts in F

- Research suggests that fibromyalgia is caused by a problem in how the body processes pain, or more precisely, a hypersensitivity to stimuli that normally should not be painful.
- Determine the extent to which chronic pain in fibromyalgia patients is associated with the activation of cells in the nervous system and the production of chemical messengers, called cytokines.
- Use of imaging methods to evaluate the status of central nervous system responses in patients diagnosed with fibromyalgia compared with those diagnosed with another chronic pain disorder and pain-free controls.

Research

- Investigation to understand how the activation of immune cells from peripheral and central nervous system sources trigger a cascade of events leading to the activation of nerve cells, chronic pain, and the dysregulation of the effects of analgesic drugs against pain.

Treatment for F

Cognitive-behavioral therapy is an important part of treatment. This therapy helps you learn how to:

- Deal with negative thoughts
- Keep a diary of pain and symptoms
- Recognize what makes your symptoms worse
- Seek out enjoyable activities
- Set limits

Kindling vs. Winding Up

Kindling

- A neurological term referred to seizure-like: an epileptic event
- A rapid escalation of provoked neurological events in a response to a benign but repetitive stimulus

Winding Up

- The day after
- Persisting of a provoked neurological event after event is stopped

Kindling and Misophonia

- In fear conditioning, an initially benign, neutral stimulus (NS), such as chewing, which does not, at first, provoke the ANS response, when paired with another antagonistic stimulus (AS) which produces "pain, discomfort, anger, etc., after several pairings of NS with AS, the "chewing", itself elicits fearful and strong reaction of the ANS.

Kindling and Misophonia

- In kindling, an initially weak, benign, neutral stimulus (NS), which at first does not evoke any neurophysiological response, after a repeated stimulation causes an epileptic seizure, an avalanched like of neurophysiological response.
- It is, therefore, a fear conditioning loop which went "astray".

Misophonia - Phobia?

- A phobia (from the Greek: φόβος, Phóbos, meaning "fear" or "morbid fear")
- type of anxiety disorder, usually defined as a
- persistent fear of an object or situation in which the sufferer
- commits to great lengths in avoiding,
- disproportional to the actual danger posed,
- often being recognized as irrational.
- In the event the phobia cannot be avoided entirely, the sufferer will endure the situation or object with marked distress and significant interference in social or occupational activities.
- Is misophonia a sub category of phonophobia?

Bourne, Edmund J. (2011). The Anxiety & Phobia Workbook 5th ed.. New Harbinger Publications. pp. 50–51.

Misophonia – Phobia?

- "In phobia, the anticipation of physical or psychological HARM is confined to definable situation".
- "If he enters into these situations…, he experiences the typical subjective and psychological symptoms of the anxiety-neurotic."
- "Fears of particular situations are based on the patient's exaggerated conception of specific harmful attributes of these situation."
- Natural consequence – REACTION instead of RESPONSE

Aaron Beck, 1976, Cognitive Therapy and Emotional Disorders

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Misophonia – Phobia?

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Aaron Beck, 1976, Cognitive Therapy and Emotional Disorders

Misophonia – Phobia?

- The amygdala's role in learned fear includes interactions with other brain regions in the neural circuit of fear.
- Role of the High Road to influence/modify the Low road reaction from the LS/ANS systems.
- Remove fear and aggression, how? Temporal lobectomy?
- CBT
- EMDR (Eye Movement Desensitization and Reprocessing)
- Hypnotherapy
- Mindfulness

Misophonia thinking disorder?

- A thinking disorder in the absence of organic pathology has been found when patients systematically misconstrued specific kind of experience.
- Patients show systematic departure from reality and logic.
- They are driven by distortions in ideation of a specific process
- These distortions have the characteristics of ANTS, they appear as a reflex
- They appear to be "normal" to the recipient but quite aberrant to others
- As time progresses the disorder intensifies with progressive distortion made towards the offender
- Increasing repetition of the offender, increasingly magnifies the distorted ideas and progressively deepens the memory of the distorted interpretations

Misophonia
An AUDITORY IMPULSIVITY DISORDER (AID)

Thank you!

And remember

ONLY PERFECT IS PERFECT

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References

1. Moller AR, Moller MB, Yokota M: Some forms of tinnitus may involve the extralemniscal auditory pathway. Laryngoscope 1992:102[10];1165-1171.

2. Moller AR, Kern JK, Grannemann B. Are the non-classical auditory pathways involved in autism and PDD? Neurol Res 2005;27[6]:625-629; http://bit.ly/autismandPDD.

3. Moller AR, Rollins P. The non-classical auditory pathways are involved in hearing in children but not in adults. Neurosci Lett 2002;319[1]:41-44.

4. Jirsa R, Poc P, Radil T: Extralemniscal co-activation is not indispensable for behavioral detection of auditory stimuli. Behav Brain Res 1993;56[2]:181-186.

5. Musiek, Frank PhD; Mohanani, Angeli; Wierzbinski, Erin; Kilgore, Gloria; Hunter, Jacob; Marotto, Jamie, The non-classical pathway: Too great to be ignored. Hearing Journal: October 2011 - Volume 64 - Issue 10 - pp 6,8

6. Daniel S. Levine, Neural network modeling of emotion. Physics of Life Reviews, Volume 4, Issue 1, March 2007, Pages 37–63

References

7. Sabatinelli, D., at al., Pleasure rather than Salience activates Human Nucleus Accumbens and Medial Prefrontal Cortex. AJP-JN Physiology, September 2007 vol.98 no3 1374-1379

8. Levitin, J. Daniel, This Is Your Brain On Music. The Science Of Human Obsession. Penguin Group, 2007

9. LeDoux Joseph, Synaptic Self, How Our Brains Become Who We Are. Penguin Books, 2003

10. Hirsch E, Danober L, Simler S, Pereira de Vasconcelos A, Maton B, Nehlig A, Marescaux C, Vergnes M., The amygdala is critical for seizure propagation from brainstem to forebrain. Neuroscience. 1997 Apr;77(4):975-84

11. Bourne, Edmund J. (2011). The Anxiety & Phobia Workbook 5th ed.. New Harbinger Publications. pp. 50–51.

12. Beck T. Aaron, Cognitive Therapy and the Emotional Disorders, A Meridian Book, 1976, p. 86

References

13. Tillfors, Maria (15). "Why do some individuals develop social phobia? A review with emphasis on the neurobiological influences". Nord J. Psychiatry (Taylor & Francis) 58 (4). doi:10.1080/08394804100057774.

14. Mark F. Bear, Barry W. Connors, Michael A. Paradiso, ed. (2007). Neuroscience: Exploring the Brain (Third ed.). Lippincott Williams & Wilkins. ISBN 9780781760034.

15. Straube, T.; Mentzel, H., & Miltner, W. R. (2005). "Neuropsychobiology". Common and District Brain Activation to Threat and Safety Signals in Social Phobia 52 (3): 163–168. doi:10.1159/000087987.

16. Etkin, Amit; Tobias Egner and Raffael Kalisch (February 2011). "Emotional processing in the anterior cingulate and medial prefrontal cortex". Trends Cogn Sci. 15 (2): 85–93. doi:10.1016/j.tics.2010.11.004

References

17. Amber M. Leaver, Laurent Renier, Mark A. Chevillet, Susan Morgan, Hung J. Kim and Josef P. Rauschecker. Dysregulation of Limbic and Auditory Networks in Tinnitus. Neuron, Volume 69, Issue 1, 13 January 2011, Pages 33-43

18. Tinnitus is the result of the brain trying, but failing, to repair itself. Josef P. Rauschecker, Retrieved from Science Daily, January 10, 2014