**UNIVERSITY OF PAVIA – IUSS SCHOOL FOR ADVANCED STUDIES PAVIA**

**Department of Brain and Behavioral Sciences (DBBS)**

**MSc in Psychology, Neuroscience and Human Sciences**



**SEEING THROUGH STIGMA: AN EXPLORATION INTO HOW BIAS AGAINST PEDOPHILIC DISORDER ALTERS EMOTIONAL RECOGNITION IN OTHERS**

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**Abstract**

This study investigates whether a stigma against pedophilic disorder impairs one's ability of emotional recognition and examines how this impairment of accuracy and reaction times varies across different modalities of emotional presentation. Using a repeated measures design, twenty-four participants were presented with narratives about two individuals, one with a non-offending pedophilic disorder and another with alcohol addiction. Participants completed emotional recognition tasks across audio and video, video only, and audio only stimuli modalities, both before and after exposure to the narratives of either mental illness. The results revealed that there was a significant interaction for both reaction times and accuracy in recognizing emotions, with audio and video modality stimuli leading the quickest and most accurate recognition of emotions. An interaction between stimuli and emotion was found, suggesting that certain emotions, like disgust and surprise, were more accurately recognized in multimodal presentations. Participants in the control group, which is alcohol addiction, reported higher levels of anger and disgust, which reflected the influence of a framing issue on emotional responses. These findings suggest that stigma can bias emotional recognition, particularly in the absence of a multimodal stimuli. The study highlights the importance of addressing stigma in clinical and social settings to ensure accurate emotional assessment and improve societal interactions with stigmatized individuals.

**Keywords**: pedophilic disorder, stigma, emotion recognition, accuracy, reaction times, multimodal stimuli

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## Acknowledgments

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**Chapter 1: Introduction**

**1.1. Historical context and diagnostic evolution of Pedophilia**

The term Pedophilia first appeared in the medical lexicon during the late nineteenth century when it was categorized as *paedophilia erotica* by Krafft-Ebing (1886/1997).  This classification was the reason pedophilia got its recognition as a mental disorder, one that would evolve significantly over the coming century. The term was later included in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-II) by the American Psychiatric Association in 1968, where it was formally acknowledged and introduced as a mental illness. This established a guideline and framework for mental health professionals to diagnose and understand pedophilia within the much broader context of paraphilias and sexual behaviors.

As the DSM evolved through the years along with the different editions that came about, the definition for pedophilia became more nuances, showing the advancements in the field of psychological research and a much deeper understanding of the disorder. The most recent iteration, *the Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5, American Psychiatric Association, 2013), redefined the condition as ''pedophilic disorder''. This new version of diagnosis emphasizes not only the presence of sexual interest in prepubescent children but also the existence and occurrence of significant distress, interpersonal impairment, or other significant difficulties arising from these interests they have.

The DSM-5 outlines many key diagnostic criteria that are extremely important and essential for diagnosing pedophilic disorder: (1) recurrent and intense sexually arousing fantasies, urges, or behaviors involving prepubescent children, (2) acting on these urges or experiencing clinically significant distress or interpersonal impairment, and (3) time-related criteria, including a duration of at least six months for such fantasies, urges, or behaviors, and an age of 16 or older for the individual, with at least a five-year difference between the individual and the child of interest.

## DSM-5 pedophilic disorder

| | |
|---|---|
| Over a period of at least 6 months, recurrent, intense sexually arousing fantasies, sexual urges, or behaviors involving sexual activity with a prepubescent child or children (generally age 13 years or younger) | **Specify if:**<br>Sexually attracted to males<br>Sexually attracted to females<br>Sexually attracted to both |
| The fantasies, sexual urges, or behaviors cause clinically significant distress or impairment in social, occupational, or other important areas of functioning | **Specify if:**<br>Limited to Incest |
| The person is at least age 16 years and at least 5 years older than the child or children in Criterion A | **Specify type:**<br>Exclusive type (attracted only to children)<br>Non-exclusive type |

*Figure 1: DSM-5 criteria for pedophilic disorder*

### 1.2. Public misconceptions and the stigmatization of Pedophilic Disorder

Despite the very clear and detailed diagnostic criteria given for the pedophilic disorder in the DSM-5, the term 'pedophile' is often loosely used in everyday discourse,

where people broadly refer to it to any individuals who have committed sexual crimes against children. This term is frequently and incorrectly used interchangeably with ''child molester'', leading to a large level of misconception surrounding it. It is important to note that not all who engage in sexual acts with children meet the diagnostic criteria for pedophilic disorder, nor do all individuals that are diagnosed with pedophilia necessarily engage in sexual behavior with children. This distinction is extremely critical, as much of the literature on pedophilia is confounded by the inclusion of individuals who do not meet the specific diagnostic criteria for categorizing their sexual interest and behavior as a mental illness (Seto, 2008).

Pedophilic disorder is among the most stigmatized mental health conditions, often subjected to intense social condemnation and severe legal repercussions. The stigma surrounding this disorder is driven by moral outrage, societal fear and deeply ingrained perception of individuals with pedophilic disorder as inherently dangerous and molly corrupt. This stigmatization is so pervasive that it not only affects how these individuals are treated by society but also informs legal and policy frameworks that further marginalize them, often without considering the nuances of the disorder or the potential for rehabilitation (Jahnke, Imhoff, & Hoyer, 2014).

The image of ''the pedophile'' as a predatory child sex offender is deeply entrenched in public discourse and has become a truism in Western cultures (Berlin & Malin, 1991; Jenkins, 1998; West, 2000). This erroneous conflation of pedophilia with the criminal conduct of child sexual abuse (Feelgood & Hoyer, 2008) has led to pedophilic disorder being one of the most highly stigmatized conditions. The intense discrimination faced by individuals with pedophilic disorder often manifests in increased social distance—an indicator of the desire to reject stigmatized people at various levels of personal contact (Feldman & Crandall, 2007). At the core of the stigmatization of

people with pedophilic sexual interests may be mental processes related to dehumanization (Harper et al., 2022). A number of research teams have examined dehumanization within the context of media representations of sexual crime, which is often dominated by offenses committed against children and subsequently conflated with "pedophilia" (Feelgood & Hoyer, 2008)

A study by Jahnke et al. (2014) highlights how public fear of sexual offenses, especially ones against minors, fuels the stigmatization of pedophilic disorder. The moral condemnation associated with this condition leads to the specific perception of individuals with pedophilic disorder as irredeemable, unworthy of empathy, and deserving of hard punitive measures. This perception has been seen to discernibly contrast with public attitudes towards other mental health conditions, which while still stigmatized, do not carry the same level of moral degradation.

## 1.3. Comparative stigmatization of Pedophilic Disorder and other mental illnesses

To fully understand the different and unique stigmatization of pedophilic disorder, it is important that we compare it with the stigmatization of other mental health conditions such as schizophrenia, depression and alcohol addiction. While these conditions are also in the light of significant stigma from the public, the literature has shown how the intensity and nature of the stigma are extremely different in keyways.

Schizophrenia, for example, is often linked with unpredictability and potential violence, which largely contributes to its stigmatization. However, literature has shown that different kinds of awareness campaigns and public education programs have increasingly changed the perception of schizophrenia and has framed it as a medical condition that can be managed with appropriate treatment, in turn reducing some of the

stigma associated with it. Angermeyer and Dietrich (2006) noted that although individuals with schizophrenia still face considerable social barriers—such as challenges in securing employment or housing—the stigma is gradually shifting toward a more medicalized understanding of the condition. This shift allows for greater public empathy and support for individuals with schizophrenia, though significant stigma persists.

On the other hand, alcohol addiction is stigmatized mostly due to its association with the perceived lack of self-control and apparent moral failure. The stigma against alcohol addiction is often tied to the belief that one could 'quit' their usage of alcohol if they simply tried harder, thereby framing this condition as a personal failure rather than a medical issue. Despite growing recognition of addiction and its symptoms as a disease, societal attitudes remain quite judgemental, with people reporting that they struggled with social exclusion and frequently faced blame due to their alcohol addiction (Dwyer & Snoek, 2017; Morris & Schomerus, 2023).  However, unlike pedophilic disorder, alcohol addiction is being seen more and more as a condition that can be overcome with treatment, with people often pushing for rehabilitation techniques and treatment methods, allowing for a more compassionate response compared to the hard moral judgements directed at pedophilic disorder.

The stigma surrounding depression is also one that presents a complex picture. Depression is often seen as a common and treatable condition; however, it remains quite stigmatized due to perceptions of weakness and the belief that individuals should be able to 'snap out of it (Yokoya et al., 2018). However, public attitudes towards depression have improved over the many years of increasing awareness programs and education, which has resulted in understanding and acceptance of the condition as a legitimate and serious mental health issue that requires support and treatment. This shift, again, contrasts

sharply with the persistent and severe stigma that is associated with pedophilic disorder, which continues to grow punitive attitudes towards the disease.

Comparing these conditions and illnesses showcases the unique plight of pedophilic disorder in the hierarchy of stigmatization. While there are definitely other mental illnesses that are stigmatized, they are often viewed as treatable to some extent, with the public idea of treatment being the best course of action. Pedophilic disorder, on the other hand, is frequently perceived as untreatable and inherently dangerous, which leads to harsher societal reactions and less willingness to consider therapeutic interventions. Then moral condemnation of pedophilic disorder not only affects public attitudes but also influences the behavior of professionals in the field, who may be less inclined to offer support or treatment to individuals with this diagnosis due to fear of social or professional repercussions.

## 1.4. Misconceptions and media influence on public perception of Pedophilic Disorder

The stigma against pedophilic disorder is further supported and entrenched by widespread misconceptions about the condition. Jahnke et al. (2014) discuss how the public often conflates pedophilic disorder with child molestation, despite the fact that not all individuals with the disorder act on their impulses. This conflation exacerbates the stigma, as the disorder is viewed not merely as a mental health issue but as a direct threat to societal safety. This fear and moral outrage contribute to extreme forms of social distancing, where the severe consequences of stigma become particularly apparent in discriminatory behaviors such as avoiding contact with stigmatized individuals or denying them housing or job opportunities (Corrigan et al., 2003; Link, 1982; Page,

1977). However, research indicates that not every person who has sexually offended against a child is a person with pedophilia (PWP) (Schmidt, Mokros, & Banse, 2013). Up to 80% of individuals incarcerated for sexually abusing a child are not PWP and do not suffer from pedophilic disorder, meaning they do not have a sexual preference for children (Seto, 2018; Walker & Panfil, 2016). Despite this distinction, the mainstream media commonly labels perpetrators of child sex offenses as "violent criminal pedophiles" (Quinn, Forsyth, & Mullen-Quinn, 2004). Most people do not explicitly inform themselves about the differences between PWP and those who have sexually offended against children, relying instead on the media for information (Wurtele, 2018).

King and Roberts (2017) showed that people often believe that anyone who has sexually offended against a child must be a predatory pedophile, a misunderstanding further reinforced by media portrayals (Harper & Hogue, 2017). Jahnke and Hoyer (2013) found that this misconception contributes to the tendency to discriminate against PWP regardless of their actual behavior. In a 2018 study, Jahnke attempted to inform participants explicitly that a PWP has never and will never commit a sexual offense. Nevertheless, participants still considered the PWP to be dangerous, highlighting the deep-rooted nature of these biases.

## 1.5. Theories of Emotion

Understanding the stigmatization of the pedophilic disorder requires an in-depth exploration on the different theories in psychology that could potentially explain how emotions influence public perceptions and responses.

The 19th century marked the beginning of a more systematic study of emotions, particularly with the advent of psychology as a distinct scientific discipline. Charles

Darwin's seminal work *The Expression of the Emotions in Man and Animals* (1872) was a pivotal moment in the study of emotions. Darwin proposed that emotions evolved to serve adaptive functions, such as communication and survival. He conducted extensive observational studies on humans and animals, arguing that emotional expressions were universal and shared across species. This work laid the foundation for later evolutionary psychology approaches to emotions.

One aspect of emotion that has long been debated in literature is the relationship between physiological responses and emotions. The James-Lange theory of emotion, for example, posits that emotions are a direct result of physiological changes in response to external stimuli. According to this theory, when individuals encounter a stimulus related to a stigmatized condition like pedophilic disorder, their bodies undergo physiological changes such as increased heart rate or muscle tension. These physiological responses are then interpreted by the brain as specific emotions, such as disgust, anger, or fear (James, 1884; Lange, 1885). Based on this, this theory suggests that the stigma associated with certain mental health conditions could amplify these physiological responses, leading to more intense emotional experiences.

While this theory by James-Lange built a foundation for the relationships between emotions and physiological responses, it has been expanded upon by other psychological models that integrate cognitive processes into the understanding of emotions. The Schachter-Singer two-factor theory of emotion suggests that emotions result from a combination of physiological arousal and cognitive labeling. Schachter and Singer (1962) argued that after a person experiences physiological arousal, they seek cues in their environment to label this arousal, which then leads to the experience of emotion. This theory is particularly relevant in the context of stigmatized mental health conditions, as the cognitive labels attached to conditions like pedophilic disorder or alcohol addiction

can significantly influence emotional outcomes. For instance, if an individual is exposed to information about pedophilic disorder and experiences physiological arousal, they might label this arousal as disgust or fear due to the negative connotations associated with the disorder.

Building on the role of cognitive processes in emotions, the cognitive appraisal theory by Lazarus provides more insight into how individuals measure, assess and respond to stimuli that may be related to stigmatized conditions. According to this theory, emotions are not merely the result of physiological responses but are also shaped by how individuals appraise or evaluate the significance of an event for their wellbeing (Lazarus, 1991). Cognitive appraisal involves assessing whether a situation is threatening, harmful, or beneficial, which in turn determines the emotional response. In the context of stigmatized mental health conditions, individuals may appraise information about pedophilic disorder as more threatening or morally objectionable than information about alcohol addiction, leading to stronger negative emotions such as anger, disgust, or fear. This appraisal process highlights the importance of cognitive factors in shaping emotional responses to stigmatized conditions and suggests that efforts to change these appraisals could potentially reduce the intensity of negative emotions associated with stigma.

Social identity theory, which was developed in 1979 by Tajfel and Turner, offered a different perspective which emphasized the role of group membership in shaping attitudes and emotions. This theory posits that individuals derive a sense of identity and self-esteem from the social groups that they belong to. In-group members are seen more favorably, while out-group members are often subjected to prejudice and discrimination. In the case of mental health conditions, individuals with pedophilic disorder may be characterized as out-group members, and hence generating strong negative emotional reactions from those in the in-group category (Islam, 2014). This categorization can

amplify the stigma associated with the disorder, as individuals seek to distance themselves away from members deemed out-group, thereby reinforcing their group identity (Tajfel & Turner, 1979). Social identity theory thus provides a framework for understanding how societal norms and group dynamics could lead to the stigmatization of certain mental health conditions and the emotional responses they elicit.

Emotional regulation theory, founded by Gross (1998), adds to another layer of their complexity of emotional perception by exploring how individuals manage their emotions to various presented stimuli. This theory suggests that people use a variety of strategies to regulate their emotions, which includes suppression, reappraisal, and avoidance. In the context of stigmatized conditions like pedophilic disorder, one might engage in emotional regulation strategies to cope with the intense negative emotions these conditions may potentially provoke. For example, they might attempt to suppress their feelings of disgust or anger when presented with information about pedophilic disorder, or they might reappraise the situation in a way that reduces the intensity of their emotional response. Emotion regulation theory is particularly relevant when considering the impact of stigma on emotion recognition, as the strategies individuals use to manage their emotions can influence their ability to accurately perceive and interpret the emotions of others.

The Constructionist Theory, or Core Affect, contradicts the foundations of Discrete Emotion theory. It suggests that emotions are not purely biological but are instead socially constructed, created in specific situations, and related to the brain's capacity for prediction in future similar situations. Core Affect is measured on a continuum of valence (pleasure or displeasure) and arousal (high or low). This perspective, championed by James Russell and Lisa Feldman Barrett, argues that emotions are brain-body context-dependent and shaped by cultural and linguistic factors

(Barrett, 2017; Ellsworth & Scherer, 2003). This theory implies that how individuals interpret and label their emotional responses to stigmatized conditions can vary significantly based on their cultural background and social context.
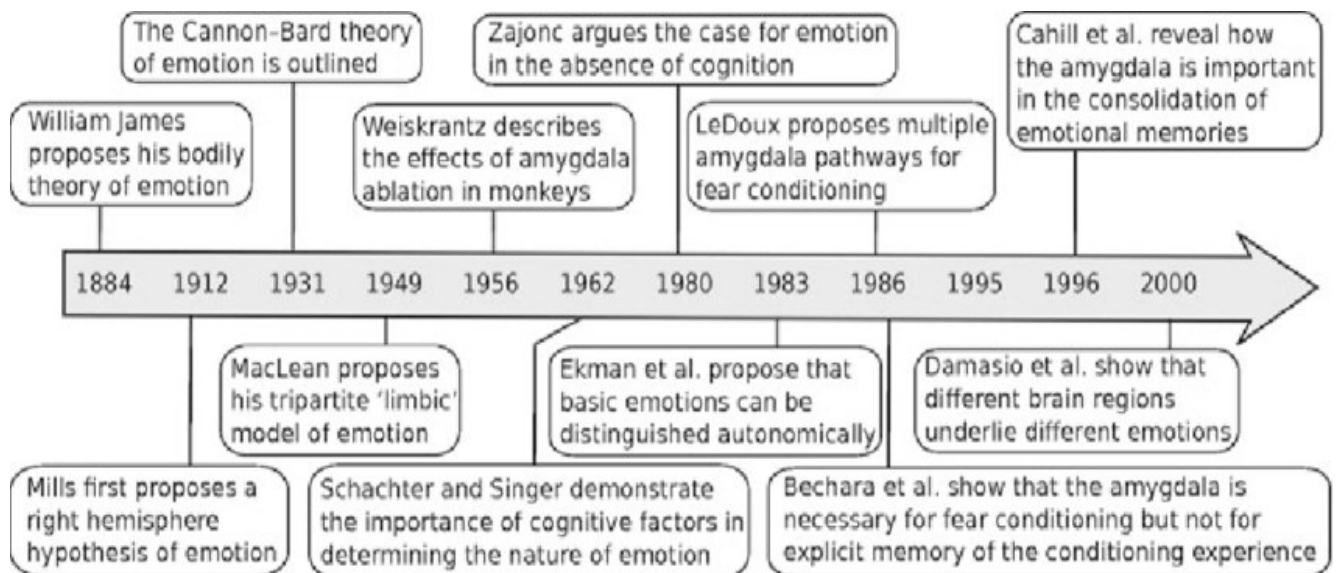


*Fig 2: A timeline of important milestones in the evolution of theories of emotions*

## 1.6. Embodied Emotions

One specific interesting field of research that has recently come about in the study of emotions is Embodied emotions, Embodied emotions are deeply intertwined with the process of emotional recognition, which suggests that physical states and bodily expressions play a crucial role in identifying and interpreting emotions. The facial feedback hypothesis suggests that the act of forming a facial expression can itself generate the corresponding emotional experience (Strack, Martin, & Stepper, 1988). This process is significant for both the individual expressing the emotion and the observer. When an observer mirrors the facial expressions of another person, even subconsciously, they may

begin to experience the associated emotion, facilitating accurate recognition of that emotion (Niedenthal, 2007). This indicates that the physical embodiment of emotions by the observer enhances their ability to perceive and interpret others' emotions accurately.

Moreover, the physical state of an observer can change their sensitivity to different emotional cues. For example, changing your posture in a certain way can affect emotional states and in return influence emotional recognition. This embodiment primes an observer's emotional recognition system, making them more responsive to detecting similar emotions in their environment (Carney, Cuddy, & Yap, 2010). Perception, which is influenced by the embodied emotions, plays a pivotal role in shaping how emotions are recognized and interpreted, and understood. Embodied cognition theory posits that cognitive processes, including perception, are deeply rooted in physical experience and the body's interaction with the environment (Barsalaou, 2008). This means that the state of a person, or a body, has the power to directly influence how an observer perceives emotional cues in others.

Interoception, which is the perception of internal bodily states, affects emotional recognition. Individuals with higher interoceptive awareness, or those who are more attuned to their bodily signals, tend to have more accurate emotional recognition abilities (Critchley & Garfinkel, 2017). This heightened awareness allows them to synchronize their bodily states with those of the supposed observed individual, leading to more accurate emotional perception.

However, it is to be noted that perception can also introduce bias in emotional recognition, especially when the observer's bodily state does not align with the emotions being observed. For example, if an observer is in a heightened state of arousal due to anxiety, they might be more likely to misinterpret neutral or ambiguous facial expressions

as threatening or angry (Zadra & Clore, 2011). This difference between the observers embodied state and the observed emotional cues can lead to inaccuracies in emotional recognition, highlighting how perception, which is influenced by embodied emotions, can skew emotional interpretation.

Moreover, cultural and contextual factors can also influence how embodied emotions play a role in emotional recognition. Cultural norms dictate the level of appropriateness of certain emotional expressions, influencing how people perceive these emotions and are mirrored by observers, in cultures where emotional restraint is valued, one might be less prone to express emotions out loud and physically, which could lessen the effectiveness of embodied emotional recognition. On the other hand, in cultures that encourage emotional expressiveness, the mirroring of emotions through embodied feedback might be more pronounced, enhancing emotional recognition (Mesquita & Frijda, 1992).

Another key aspect of how embodied emotions influence emotional recognition is seen to lie in the potential for bias. Biases in emotional recognition can be brought up when the observer's own embodied emotional states conflict with the emotional state that they are observing. For example, if an observer is feeling anger or frustration, their ability to recognize positive emotions such as joy or contentment in others may be drastically impaired. This bias is particularly relevant in the context of stigmatized mental health conditions, where the observer's embodied emotional state is influenced by societal prejudices and fears. When individuals perceive someone with a stigmatized condition like pedophilic disorder, their embodied emotions—such as disgust or fear—can override more neutral or empathetic responses, leading to biased emotional recognition (Jahnke et al., 2014).

## 1.7. Core Affect and Neural Basis of Emotion Recognition

Core affect, as described by Damasio (1999), refers to the neurophysiological and somato-visceral responses elicited by environmental stimuli. These responses are influenced by the interaction between the organism and its environment, shaping emotions, moods, attitudes, and various cognitive processes. Core affect plays a central role in emotional recognition, stereotyping, judgment, decision-making, and other cognitive functions (Feldman Barrett & Bliss-Moreau, 2010). Understanding core affect is crucial for explaining how individuals perceive and respond to emotionally charged stimuli, especially in the context of stigma and prejudice.
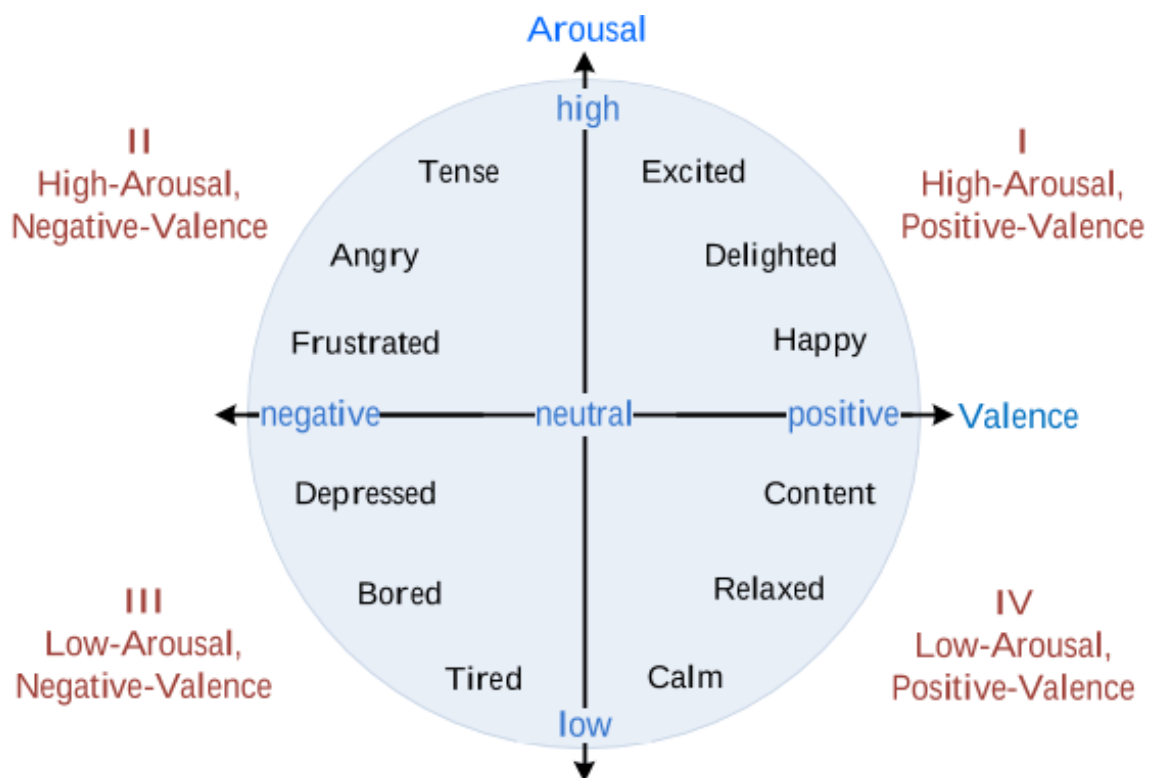


*Fig 3:* A schema for the two-dimensional structure of core affect. Adapted from Feldman Barrett and Russell (1999).

Core affect is a state of being, often under the control of environmental factors such as people, places, or events. It is considered to be a primitive and universal concept, with evidence showing that it can be measured through facial expressions, voice recognition, and the peripheral nervous system (Russell, 2003). The neural basis of core affect involves complex circuitry within the brain, including subcortical regions such as the amygdala and brainstem, as well as anterior frontal regions which are associated with cognition. These areas are responsible for processing sensory information and regulating the body's homeostatic state, which influences emotional responses and cognitive processes (Schaefer, 2022).

According to Duncan and Feldman Barrett (2007), affect's circuitry (sensory and somato-visceral information that later is translated into valence and mental representation) activates the amygdala and ventral striatum, with anterior portions of the cortex, such as the lateral orbitofrontal cortex (OFC), the medial OFC, often called by the ventromedial prefrontal cortex (vmPFC) and anterior cingulate cortex (ACC), which is

depicted                      in                    Figure                    4
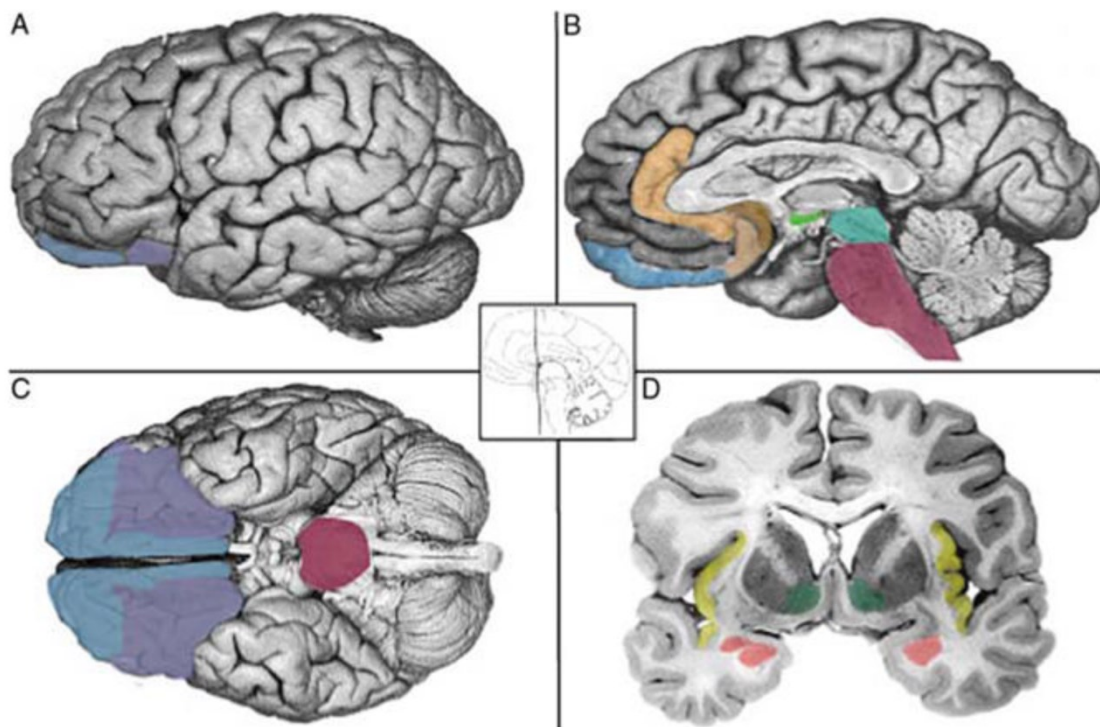


*Figure 4:* Brain regions associated with core affect including sensory and visceromotor networks in the OFC (A and C images – blue and purple), AI (D – yellow), AMG (D – rose), ACC (B – copper and tan), hypothalamus (B – light green) and ventral striatum (D-dark green), midbrain (B – turquoise) and brainstem (B and C – dark pink). Adapted from Duncan & Feldman Barrett (2007).

        The amygdala, in particular, directs attention to uncertain or ambiguous stimuli, guiding the organism's response to new information, and storing this information for future use. This process is critical for understanding how individuals learn to predict and respond to emotionally charged stimuli, such as those associated with stigma (Duncan & Feldman Barrett, 2007). Neuroscientific research supports this connection by showing that the amygdala plays a critical role in processing emotionally salient stimuli,

particularly those that are perceived as threatening (Phelps & LeDoux, 2005). When core affect is activated by a stigmatized stimulus, such as encountering someone with pedophilic disorder, the amygdala and related brain regions may amplify the emotional bias, leading to a distorted perception of the individual's emotional expressions. This bias is further reinforced by the orbitofrontal cortex (OFC), which integrates sensory information and evaluates its emotional significance based on prior experiences and societal norms (Duncan & Feldman Barrett, 2007).

A study that was done to show how human emotion share core affective properties showed that as activity changes in left amygdala, so does the subjective experience of arousal emotions, suggesting that arousal is a basic property of human emotional experience (Wilson-Mendenhall et al., 2013)

Located deep within the lateral sulcus, the insula is another important structure that is involved in core affect. It is responsible for interoceptive awareness, which is the perception of internal bodily states such as heartbeat, respiration and visceral sensations. (Critchley, Wiens, Rotshtein, Ohman, & Dolan, 2004). The insula integrates these internal signals with external sensory information, which in turn produces a subjective feeling state, thereby contributing to the valence dimension of core affect. The anterior insula in particular, is associated with the conscious experience of emotions and is activated during the awareness of bodily sensations that are integral to emotional experience (Craig, 2009; Gu, Hof, Friston, & Fan, 2013).

Next, the Thalamus acts as a relay station for sensory information, where it directs the information to the appropriate cortical and subcortical regions for further processing.

In the context of core affect, the thalamus plays a role in the initial appraisal of sensory stimuli, which influences both arousal and valence by rapidly sending information to the cortical and the amygdala. The thalamic pathway allows for quick responses to emotionally relevant stimuli and a nuanced, reflective processing via cortical routes. The anterior cingulate cortex is involved in the regulation of emotional responses and attention. It monitors conflicts between competing emotional and cognitive demands and plays a role in error detection and adaptive control of behavior (Bush, Luu, & Posner, 2000). The ACC is particularly important for the regulation of negative emotions and has been linked to the experience of pain and distress. Its connections with the amygdala and prefrontal cortex enable it to modulate emotional intensity and maintain emotional stability.

The hippocampus, which is primarily known for its role in the formation of memories, also contributes to core affect by contextualizing emotional experiences. This means that it helps encode the emotional significance of specific events, associating and linking it with current experiences with past memories to allow them to guide future behavior. The hippocampus interacts with the amygdala, enhancing the emotional salience of memories, especially those associated with fear or pleasure, which in turn influences the arousal dimension of core affect (Fanselow & Don, 2010).

A visual depiction of how these regions interact with one another can be found in figure 5.
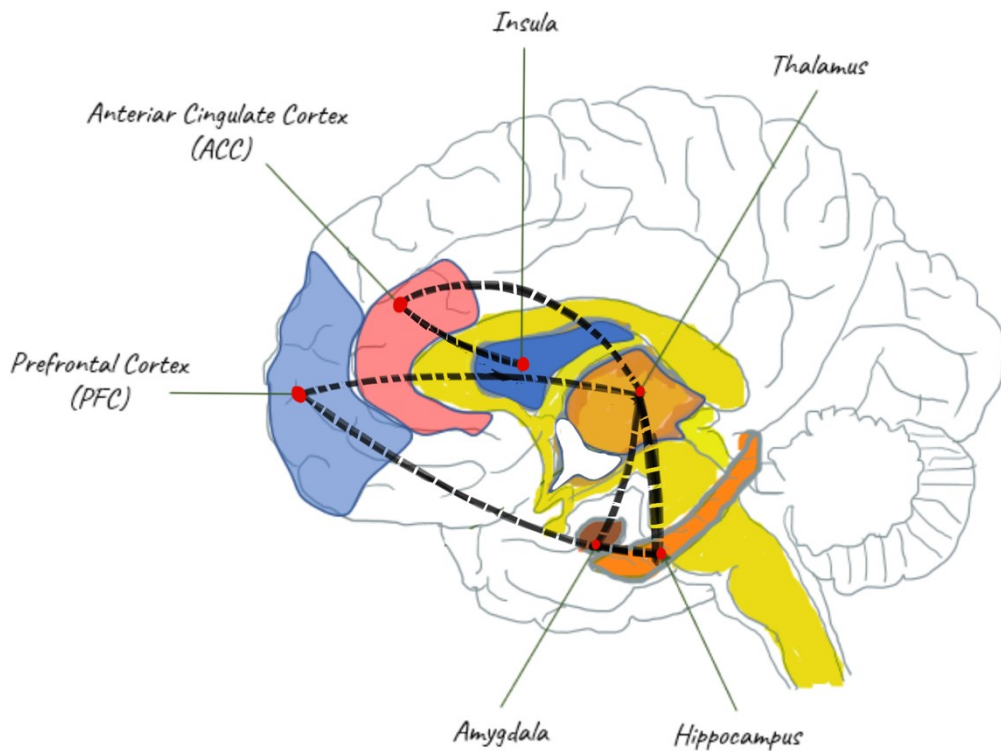
*Fig 5:* The dashed lines show the connected interplay of different regions.

A simplified version of the traditional view that addresses the question if cognition
and affect are separable processes is visualized in Figure 6 and it shows that negative and
positive affect are computed in the amygdala and nucleus accumbens, respectively, both
of which receive sensory input from thalamic nuclei and sensory cortex, and both of
which send output to the brainstem. Cognitive processes are thought to regulate affective
processing after the fact via inhibitory projections from the prefrontal cortex to these

subcortical areas (Duncan and Feeldman Barret, 2009). They showed that the brain in fact does respect the divide between cognitive and affect. The two related functions of the affective circuit system are shown in Figure 6, which clearly demonstrates that the first circuit involves the connection between the basolateral complex (BL) of the amygdala (AMG) and central and lateral regions of the orbitofrontal cortex (OFC). It is relevant to mention that the AMG together with amygdalar nuclei guides the organism to learn about survival and prediction and the OFC is relevant for the flexible, experience or context-dependent representation of an object's value (Duncan and Feeldman Barret, 2007)
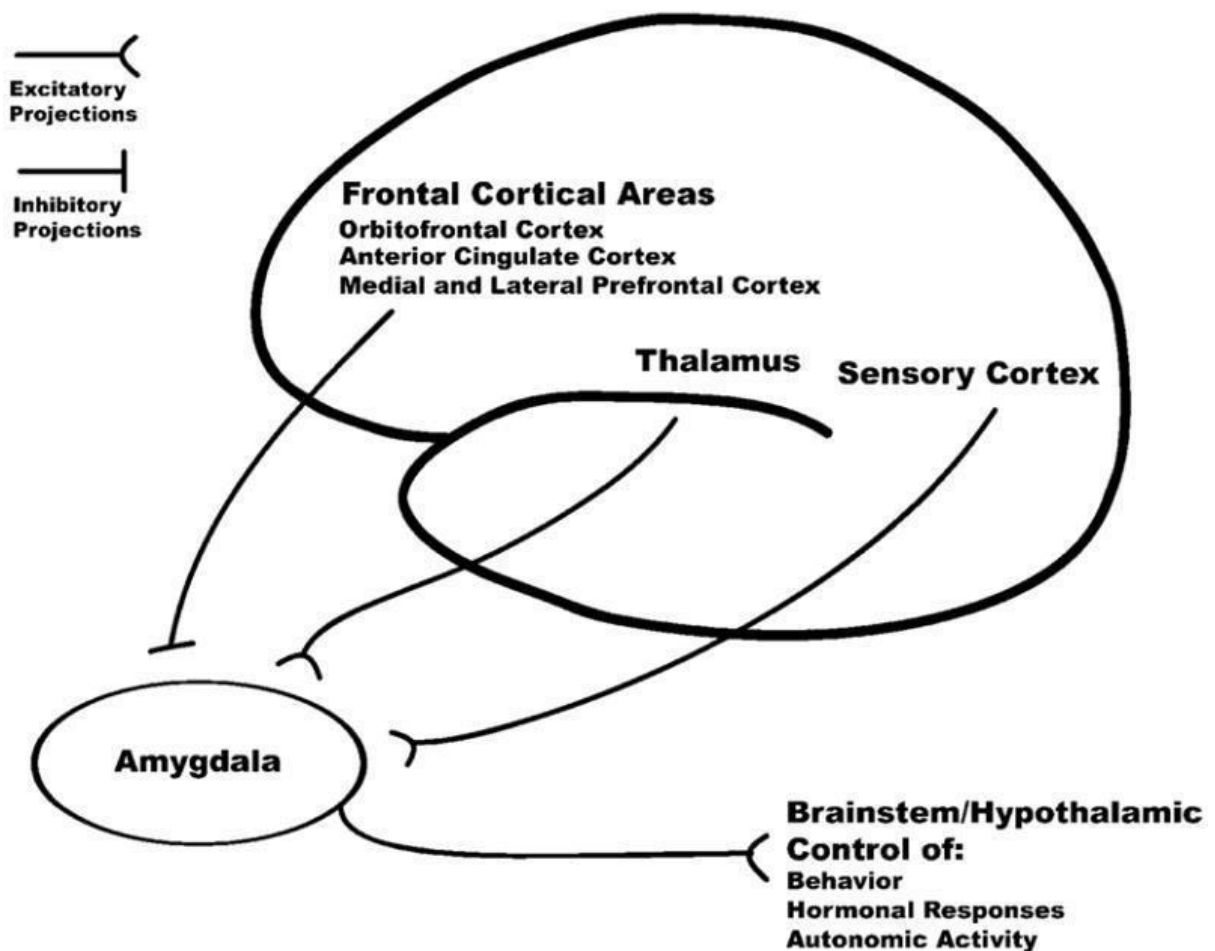


*Fig 6:* Processing of the affect network. Adapted from Duncan & Feldman Barrett (2007)

It is important to note that core affect is not localized to a single brain region, but it is a product of the dynamic interactions between these and other regions. The integration of the different aforementioned aspects like interoceptive signals, sensory information and cognitive processes occurs through a network of neural circuits, that mainly involve the regions that were mentioned- the amygdala, prefrontal cortex, insula and anterior cingulate cortex. The valence and arousal that participants experienced during a study by Feeldman Barrett and colleagues, varied instances of fear, sadness, and happiness correlated with neural activity in medial OFC and left amygdala, respectively. These brain regions are highly connected structures that have continual access to information about the state of the body and the state of the world and are thereby able to influence the body to do what is necessary to deal with the world (Barrett & Bliss-Moreau, 2009). Which means, that these circuits are responsible for assessing the emotional relevance of stimuli, which results in generating appropriate affective responses and then regulating those responses based on internal and external factors.
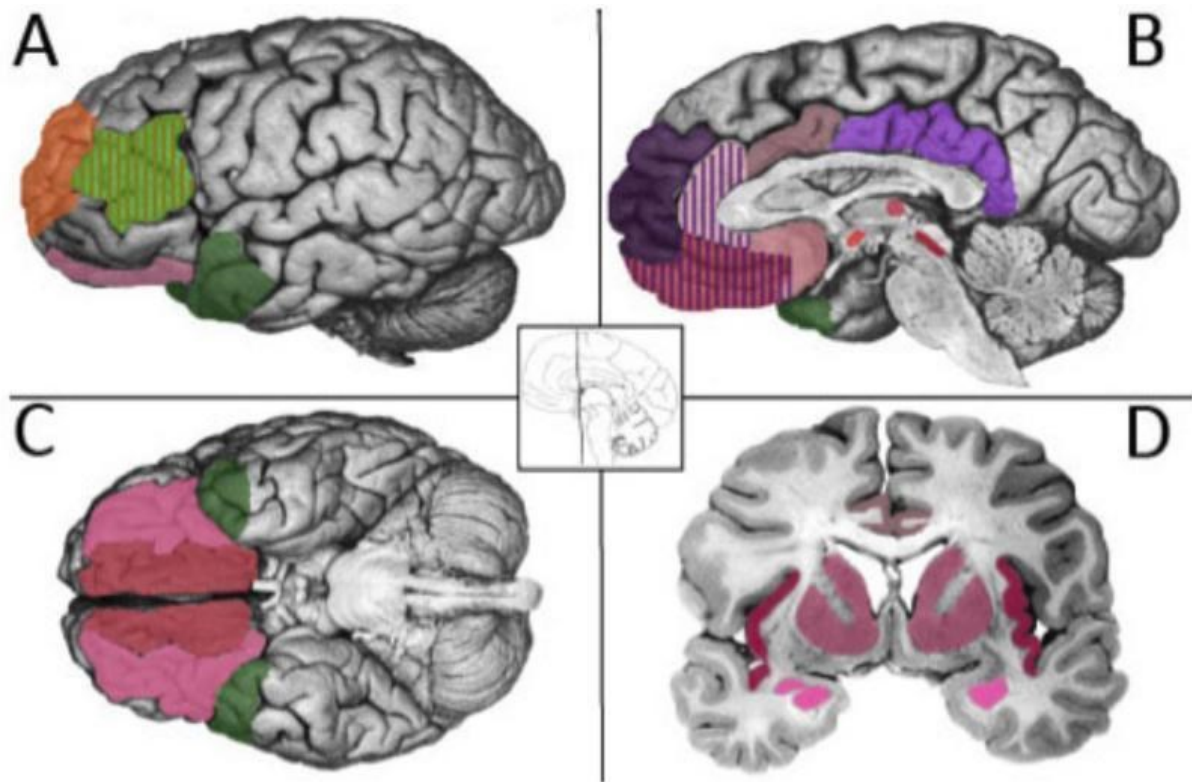
Fig 7: *Psychological Constructionist Approach of Brain–Emotion Correspondence*
*A: Lateral view. B: Sagital view at the midline. C: Ventral view. D: Coronal view.*

*Brain regions associated with psychological operations are depicted... Core Affect (pink): amygdala, insula, mOFC, IOFC, ACC, thalamus, hypothalamus, bed nucleus of the stria terminalis, basal forebrain, PAG. Conceptualization(purple): VMPFC, medial temporal lobe\* (hippocampus, entorhinal cortex, parahippocampal cortex), posterior cingulate cortex/retrosplenial area. Language (green): VLPFC), anterior temporal (adapted from Feeldman Barret et al.,2012)*

It is important to note that the observer's emotions are also relevant when reading facial expressions. The core effect of the own observer influences the perception. For example, if the observer has a negative mood or emotion, there is a bias of the perception toward negative emotions of others or even negative situations, the same happens for

neutral or positive emotions. Aversive situations in the daily routine can negatively influence the perception of the organism, having a huge impact on identifying, differentiating, and describing feelings, impairment in social life, decision making, trustworthiness, and so on (Zadra & Clore, 2011).

This theoretical perspective suggests that core affect, which is the basic neurophysiological response to stimuli, plays a crucial role in understanding the extremely important and drastic reactions often associated with pedophilic disorder. The amygdala, which is a key region that is involved in processing threats and eliciting fear responses, could potentially be particularly active when individuals are exposed to information related to pedophilic disorder. This heightened activation can lead to intense emotional responses, like disgust and fear, which are not just reactions but are deeply rooted in the brain's affective circuitry (Domassio, 1999). These responses, in turn, strengthen and act on the dehumanization and moral condemnation of individuals with pedophilic disorder, as highlighted by Jahnke et al., (2014).

### 1.8. Recognizing Emotions: The role of Facial and Auditory cues

Facial expressions are a result of the movements or positions of facial muscles, and the ability to accurately read and interpret these expressions is crucial for social interaction and emotional recognition. This skill is influenced by both evolutionary factors and social experiences, with evidence suggesting that facial affect recognition has played an adaptive role in human evolution (Schmidt & Cohn, 2001). Studies with animal models have further supported the evolutionary basis of facial recognition, demonstrating

the importance of this ability for social bonding and communication across species (Johnson, Senju & Tomalski, 2015).

Humans can enhance their facial affect recognition abilities through social interaction, particularly in recognizing emotions such as joy, surprise, anger, fear, disgust, sadness, and contempt (Hwang & Matsumoto, 2010). However, the observer's own core affect can influence their perception of others' emotions, like we mentioned in the previous chapter. For instance, if an observer is in a negative emotional state, they may be more likely to perceive negative emotions in others or misinterpret neutral emotions as negative. This bias can significantly impact social interactions, leading to impaired communication, decision-making, and social relationships (Zadra & Clore, 2011).

Considering emotional recognition is an important part of social interaction, the ability to accurately differentiate emotional expressions is crucial for social skills, empathy, and a higher sense of emotional intelligence. However, it is important to know that the expression of emotions, per se, is one that can vary across different contexts and cultures, making recognizing them a complex skill. In legal, educational and clinical settings, the accurate recognition and interpretation of facial expressions can have significant implications for judgement, decision making and the treatment of psychiatric disorders (Feeldman Barrett et al., 2019). When considering pedophilic disorder, it is important that we are aware of the potential there is for discriminatory biases to influence facial affect reading and emotion recognition, which could lead to negative outcomes for individuals with the disorder.

While much of the research on emotional recognition has focused on visual cues, such as facial expressions and body language, auditory cues—such as tone of voice, pitch, and speech rhythm—are equally important. These auditory cues can convey a wide range

of emotional states, including anger, happiness, sadness, and fear, and are often processed alongside visual information to form a comprehensive understanding of another person's emotional state (Schirmer & Kotz, 2006).

The vocal aspect of communication carries information about the emotional content of speech. Speech can be divided into two parts: an explicit message, consisting of what was said, and an implicit emotional expression, entailing how the message was said. Auditory cues are processed in the brain's auditory cortex and are integral to the recognition of emotions. The prosody of speech, which includes elements such as intonation, stress, and rhythm, plays a significant role in conveying emotion. For example, a rising pitch at the end of a sentence can indicate a question or uncertainty, while a monotonous tone might convey boredom or sadness (Juslin & Laukka, 2003). The ability to accurately interpret these cues is essential for effective communication and social interaction.

Research has shown that different emotions are usually associated with distinct acoustic patterns. For example, anger is typically expressed through loud, high-pitched and face paced speech. On the other hand, sadness is usually conveyed through slower-lower-pitched and softer voices (Banse & Scherer, 1996). These patterns are consistent across cultures, which suggests that the auditory aspect of recognition of emotions is a universal human ability, deeply rooted in our evolutionary history (Pell et al., 2009).

The recognition of emotions through auditory cues involves the use of both cognitive and neural mechanisms. The auditory complex is primarily responsible for processing the basic elements of sounds, which higher order brain regions like the amygdala are involved in interpreting the emotional content of these sounds (Schimer & Kotz, 2006). The amygdala plays a crucial role in the rapid detections of emotionally

salient stimuli, like fearful or angry tone of voice, which can trigger immediate physiological and behavioral responses in a person (Sander et al., 2005).

The integration of both the auditory and visual information occurs in regions such as the superior temporal sulcus, which is involved in multisensory processing. This allows for a more accurate and contextually relevant interpretation of emotional signals, as auditory cues can complement or enhance the information that are provided by visual cues (Campanella & Belin, 2007). This is an important aspect to look at in the context of stigmatized disorder like pedophilic disorder, where preexisting and preconceived notions can take over or distort the recognition of emotions.

**1.9. Emotional Recognition and the stigma associated with Pedophilic disorder**

Although multiple studies have been conducted and proved that stigma against pedophilic disorder exists, and there is a small number of papers on understanding emotional recognition in people with pedophilia, there has been little to no research done on how this stigmatization impacts the perception of emotions. This literature review has explored the complex interplay that exists in understanding stigma, emotion and perception in the context of mental illnesses, especially pedophilic disorder. The stigma that is often associated with pedophilic disorder could significantly distort emotional recognition, leading to a biased interpretation of emotional cues- therein causing an inaccuracy in recognizing emotions. This study will look at the concept of core affect playing a central role in this process along with using the foundations of embodied emotions. Neuroscientific research underscores the relationship between core affect and stigmatization of conditions like pedophilic disorder, showing how brain regions amplify emotional biases, which could lead to distorted perceptions along with the embodied

emotions allowing us the look at the emotional state of the observer and its impact on the

perception of others' emotions. By utilising these two approaches, this thesis aims to

explore whether the accuracy of emotion recognition is significantly impacted by the

perception of pedophilic disorder along with analysing the relationship with reaction time

to broaden the intricacies of studying emotional recognition.

## Chapter 2: Methodology

## Participants:

The study involved 24 participants, which included 15 female and 9 male participants (range=18-32; M= 24.6; SD =2.64), mostly comprising of university students from Milan and Pavia. The participants were recruited through voluntary sampling and were English speakers. The participants from the University of Pavia's Master of Science in Psychology, Neuroscience and Human Sciences course were offered credits that could be accounted into their Industrial Training Activities credits.

The exclusion criteria for this research were: 1) Participants with psychiatric conditions like anxiety and depression; 2) Neurological disorders; 3) non-English speakers.

## Materials

In order to achieve the aim of this study, which was to explore if the perception of pedophilic disorder affected the ability of emotional recognition and to investigate if there are specific emotions that are impaired, the researcher used two written texts regarding pedophilic disorder and alcohol addiction, respectively (see Appendix 4 and 5). The texts were sampled and written by the researcher, completely fictional, ensuring both the texts followed the same word count, writing style, and emotion inducing words. The experimental group (pedophilic disorder) was about a man named John who suffered from

pedophilic disorder and what his life looked like. The control group (alcohol addiction) was about a man named Mark who suffered from alcohol addiction and what his life looked like. It is to be noted that this study utilized alcohol addiction as the control group due to the large amount of literature that was contributed to evidencing it being another largely stigmatized mental illness and for literature supporting the evidence that a large number of alcohol consumption often leads to serious crimes and domestic violence (Fritz et al., 2023).

The study utilized a modified version of the Ryerson Audio-Visual Database of Emotional Speech and Song (RAVDESS). This portion of the RAVDESS contains 144 files: 48 trials per actor x 3 actors = 144 total.  This RAVDESS test contained 3 professional female actors, vocalizing two lexically matched statements in a neutral North American accent. Speech emotions included happy, sad, angry, fearful, surprise, and disgust expressions. Each expression is produced at two levels of emotional intensity (normal, strong), with an additional neutral expression. The stimuli were presented in three modalities: (1) audio and video, (2) video only, and (3) audio only. This emotional recognition test was conducted Psychopy v2022.1.3. (Pierce, et al., 2022) and shown to participants on a HP laptop with a screen of 17''.

To ensure no bias related to psychiatric disorders, the participants answered two scales, the State-Trait Anxiety Inventory (STAI) and Beck Depression Inventory (BDI). STAI is a self-reported 40-item scale divided into two sections of 20 items each (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The first section (STAI_1) measures the level of anxiety at the present moment (state) and the participant has to answer the statements on a scale from 1 to 4, whether 1 (not at all) does not represent its emotional state to 4 (very much so) strongly represents its emotional state. The second section (STAI_2) consists of the other 20 items that measure anxiety in general terms

(trait) , which follow the same logic, whether the answer 1 (almost never) does not represent its emotional state and 4 (almost always) mostly represents its emotional state (see appendix 1 for STAI_1 and appendix 2 for STAI_2).

The Beck Depression Inventory (see appendix 3) is a self-reported scale that measures depression in people with and without a psychiatric condition. It is composed of 21 items on a 4-point scale, where it is expected for the participant to answer from 0 (no symptom) to 3 (severe symptoms) the affirmation that best matches with its feelings (Jackson-Koku, 2016).

Both the BDI and STAI tests were administered through pencil and paper.

The study also utilized a Likert-scale questionnaire tailored to the specific group each participant was assigned to. This questionnaire was designed to measure the participants' immediate emotional states after being exposed to the texts- pedophilic disorder or alcohol addiction. The Likert scale ranged from 1 to 5, with the following options presented: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly Agree). Each participant responded to six questions that corresponded to the six emotions being studied in this research: anger, sadness, fear, happiness, surprise and disgust (See appendix 6 for Experimental group and appendix 7 for control group's Likert-scales).

## Design

This research is a Group Comparison Study, specifically a repeated measures factorial design (6 x 2 x 2 x 3) that is aimed at exploring how the perception of pedophilic disorder (experimental group) influences emotional recognition compared to alcohol addiction (control group). It examines six different emotions (happy, sad, angry, fearful,

surprised and disgusted) across pre-test and post-test to assess emotional recognition before and after exposure to information regarding pedophilic disorder or alcohol addiction. The participants we exposed to the emotional stimuli presented in all three kinds of modalities.

The primary aim of this research is to determine whether stigmatizing information about pedophilic disorder impairs the ability to recognize specific emotions and to explore how this potential impairment may vary across different modalities of emotional presentation. By comparing pre and post test results, this study also seeks to identify not only the direct effects of the potentially stigmatized information but also interaction effects between the types of condition, reaction times and the modalities.

## Procedure

During the recruitment phase, potential participants were warned about the potentially triggering nature of the study and asked to be sure of their willingness to take part in a study of such nature.

Prior to the experiment starting, participants were first asked to review and sign the consent agreement, after being informed of their rights and their right to withdrawal as well. Following the consent process, each participant was required to complete the BDI and STAI that was administered to them via pen and paper.

Upon completion of these preliminary assessments, participants were randomly assigned to one of two groups: John (Experimental) and Mark (Control). Randomized assignment was done to ensure the possibility of minimizing any potential biases.

Both groups then proceeded with the pre-test phase, where they completed the 15-minute long RAVDESS test on a computer. This test involved recognizing and categorizing emotional expressions that were presented through the different stimuli modalities. The participants would either hear, watch or hear and watch an emotion being played and immediately afterward, be redirected to the next page where they were asked to click on the emotion, they felt was accurate to what they had just witnessed. The test allowed for a trial phase for each modality, allowing the participants to get comfortable with the testing process. The pre-test phase was carried out to provide a baseline measure of each participant's emotional recognition abilities before exposure to any condition.

After completing the pre-test, participants were given a printed text corresponding to their assigned group. Participants were given adequate time to read and reflect on the content of the text at hand. Post this, they were asked to fill out the Likert scale questionnaire which was tailored to each group. The questionnaire was administered via pen and paper and the participants were asked to reflect on their emotions based on the text they had read.

Once the Likert scale questionnaire was completed, participants were asked to return to the computer and carry out the RAVDESS test for the second time. The post-test followed the same procedures as the pre-test and also lasted 15 minutes.

All the participants' data was anonymized, with each participant corresponding to a number. In total, each participant's involvement in the experiment lasted about one hour after being thanked for their involvement in the study and debriefing, if it was necessary.

## Chapter 3: Analysis and results

All data collected from the experiment was initially coded into an Excel file. This file included the scored results from each participant's BDI and STAI. Along with this, the Likert scale answers were also manually recorded into the file for both the control group (n=12) and the experimental group (n=12).

To start the data analysis, the participants pre and post test results from the RAVDESS were separated into two categories: reaction time and accuracy. They were then further organized according to each specific emotion: A (Anger), S (Sadness), Fear (F), H (Happiness), Su (Surprise), and D (Disgust). It was also categorized based on the stimuli modality: Audio and Video (01), Video only (02), and Audio only (03).  An example of how each data file was stored: H_01_Acc_pre. This means that this file contained the results for a participant's data on the accuracy of happiness during the pre-tests on the audio and video modality.

Before conducting the analysis, the data underwent a cleaning process to ensure its accuracy. First, the mean and standard deviation was calculated for each set of data to identify any variability in the participants' performance on Excel after exporting the data. Following this, data points that exhibited ceiling effects were identified and removed to prevent skewing the results. Once the data was cleaned, the averages for both the reaction time and accuracy were calculated for each emotion on each modality for both the pre and posttest and were exported to the file containing the demographics and STAI and BDI results. All the statistical analysis was done on JAMOVI v.2.3.28.

The study included 24 participants. The gender distribution included 9 males and 12 females. Participants were randomly assigned to either the control group (Mark) with n= 12 or the experimental group (John) with n=12. The t-test for age showed no significant difference with t(22)= 0.45, p=0.65, showing that the age's for the two groups are comparable.

The BDI showed scores of M=10.4 (SD = 10.7) The groups showed a non-significant difference in BDI scores [t(22) =−1.75,p=0.09] (with Mark's group having non-significant higher BDI scores on average) . The STAI1 showed scores of M= 35.5 (SD =10.9) and the STAI2 showed scores of M=40.6 (SD= 12.5). No significant difference between groups, [t(22)=−1.36,p=0.18] were seen for STAI1 , nor for STAI2 (t(22)=−1.66,p=0.11) .Figures 1, 2, and 3 show the density histograms for BDI, STAI_1 and STAI_2 scores respectively across John and Marks group.
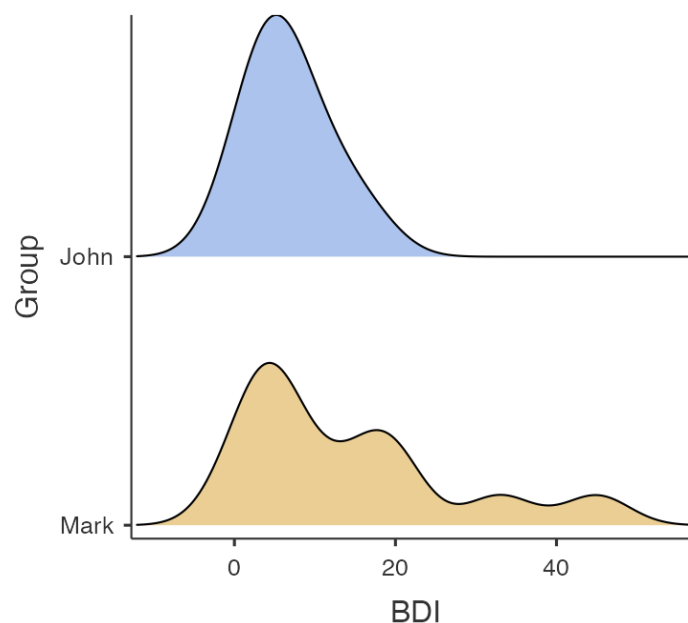


*Fig 1*: BDI scores across the two groups
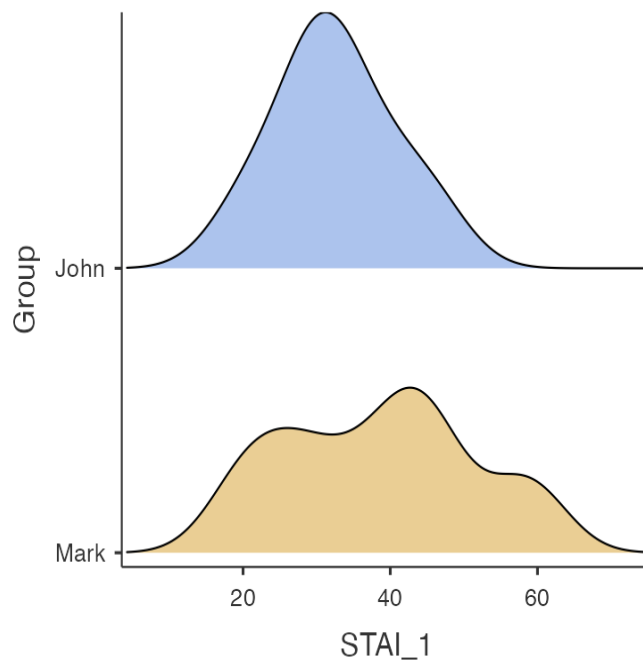
*Fig 2:* STAI_1 scores across the two groups
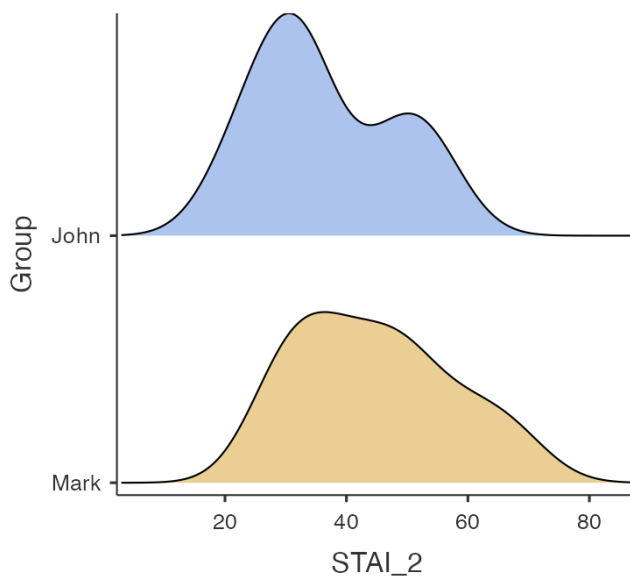


*Fig 3:* STAI_2 scores across the two groups

Reaction times (RTs) were analyzed using repeated measures ANOVA to compare condition (pre and post), type of emotion (H, S, A, F, D, Su) and kind of stimuli (audio+video, video, audio) between groups (John's story and Mark's story).

A main effect of condition was observed indicating that reaction times differed significantly between the pre-test and post-test phases [$F(1, 22) = 22.12$, $p < .001$, $\eta^2p = 0.50$], with faster reaction times recorded in the post-test. Bonferonni corrected post-hoc tests revealed a significant difference between pre-test and post-test reaction time ($p < .001$)

A main effect of Stimuli in RTs was found [$F(2, 44) = 29.36$, $p < .001$, $\eta^2p = 0.57$], showing that the type of stimuli significantly influenced reaction times. The Audio+Video stimuli had the fastest reaction times, which was followed by Video-only and Audio-only conditions. Bonferroni-corrected post-hoc tests revealed significant differences between the Audio+Video and both Video-only ($p < .01$) and Audio-only stimuli ($p < .01$).

There was a significant main effect of emotion [$F(5, 110) = 5.20$, $p < .001$, $\eta^2p = 0.19$], showing that reaction times varied depending on the type of emotion, with happiness generally eliciting faster responses compared to other emotions. Bonferroni post hoc tests revealed a significant difference with Happiness and Surprise ($p < 0.002$)

Also, a significant main effect of group was found that showed difference in RTs between John's story and Mark's story [$F(1,22) = 6.10$, $p=.022$, $\eta^2p=0.217$] and the Bonferroni post hoc tests also revealed a significant difference ($p < 0.022$)

In the RTs, the interaction between Condition and Stimuli was significant [$F(2, 44) = 4.21$, $p = .02$, $\eta^2p = 0.16$], indicating that the effect of stimuli on reaction times differed between the pre-test and post-test phases. A significant three-way interaction was

found [$F(5, 110) = 2.30$, $p = .05$, $\eta^2 p = 0.09$], which shows that the interaction between Condition and Emotion was differentially affected by Group. Along with this, an interaction between stimuli and emotion was significant [$F(10,220) = 6.20$, $p < 0.00$, $\eta^2 p = 0.220$]
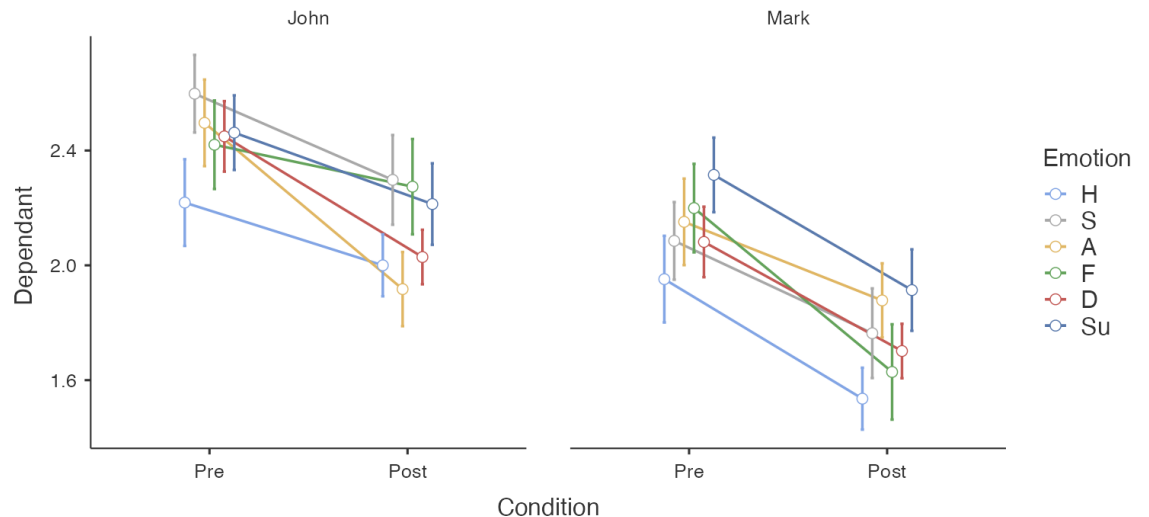


*Fig 4:* Estimated Marginal Means plot of emotions across pre and post tests for both the groups to measure RTs.

Accuracy scores in recognizing emotions were analyzed using repeated measures ANOVA to compare condition (pre and post), type of emotion (H, S, A, F, D, Su) and kind of stimuli (audio+video, video, audio) between groups (John's story and Mark's story).

A main effect of condition was not observed in accuracy, indicating that there was no significant difference between the pre-test and post-test phases [$F (1, 22) = .21$ $p < .64$, $\eta^2 p = 0.10$].

A main effect of Stimuli in Accuracy was found [$F (2, 44) = 60.45$, $p < .001$, $\eta^2 p = 0.78$], showing that the type of stimuli significantly influenced the accuracy of

recognizing emotions. Post hoc tests showed a significant difference across all the stimuli suggesting that the type of stimuli significantly affects accuracy, with Audio+Video resulting in the highest accuracy, followed by Video, and then Audio alone.

There was a significant main effect of emotion [$F(5, 110) = 9.43$, $p < .001$, $\eta^2 p = 0.30$], showing that accuracies varied depending on the type of emotion. Bonferroni post hoc tests revealed that Happiness generally has higher accuracy scores compared to Sadness ($p < 0.001$), Disgust ($p < 0.001$), and Surprise ($p = 0.006$). Anger ($p = 0.005$) and Fear ($p = 0.002$) also show significantly higher accuracy than Disgust. Disgust has significantly lower accuracy compared to Surprise ($p = 0.033$).

No significant main effect of the group was found that showed no difference in accuracies between John's story and Mark's story [$F (1,22) = 1.03$, $p = .32$, $\eta^2 p = 0.45$].

A significant interaction between Emotion and Group [$F (5,110) = 2.417$, $p = .04$, $\eta^2 p = 0.045$]. Bonferroni post hoc tests revealed that there is a significant difference in the ability to accurately recognize between Happiness and Disgust within the John group, with Happiness being recognized more accurately($p < .001$)Within the Mark group, Happiness is recognized significantly more accurately than Disgust ($p < .001$).Within the John group, Fear is recognized significantly more accurately than Disgust ($p = 0.03$)

A significant interaction between stimuli and Emotion was found $F (10,220) = 26.031$, $p < .001$, $\eta^2 p = 0.542$], suggesting that specific emotions are recognized differently depending on the type of stimuli. Bonferroni post hoc  analyses showed that disgust and surprise were significantly more accurately recognized when using Video or Audio+Video stimuli compared to Audio alone, with very strong statistical significance in all comparisons ($p < .001$).It also indicated that sadness and happiness are more accurately recognized with Video stimuli compared to Audio+Video stimuli, with

statistically significant differences as indicated by the p-values (p<.001) for Sadness, (p<.05) for Happiness).
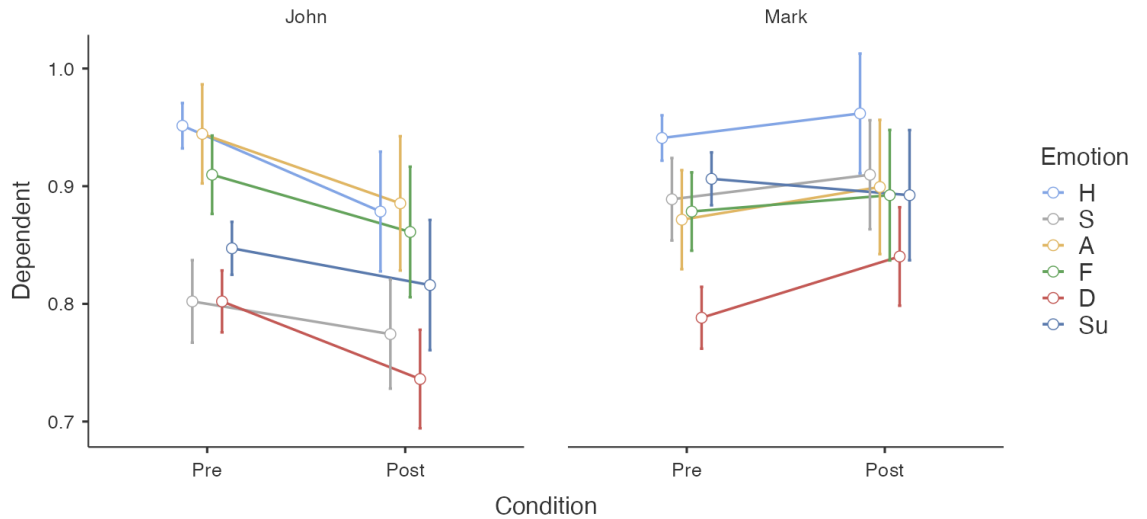


*Fig 5:* Estimated Marginal Means plot of emotions across pre and post tests for both the groups to accuracy.

To better highlight other possible differences that the ANOVA might have not detected, we calculated delta scores subtracting pre-text administration scores to post-administration scores.

The T-tests were conducted using deltas for both RTs and Accuracy.

T-tests for RTs indicated a trend of significance difference between groups in Fear for audio only condition (Cohen's d = .792, p = .062), meaning that in Mark's group participants reduced their reaction times after the story's presentation more than John's

group (or vice versa → in John's group participants' reaction times after reading the story were slower than Mark's group) as we can see in the box plot in figure 6.
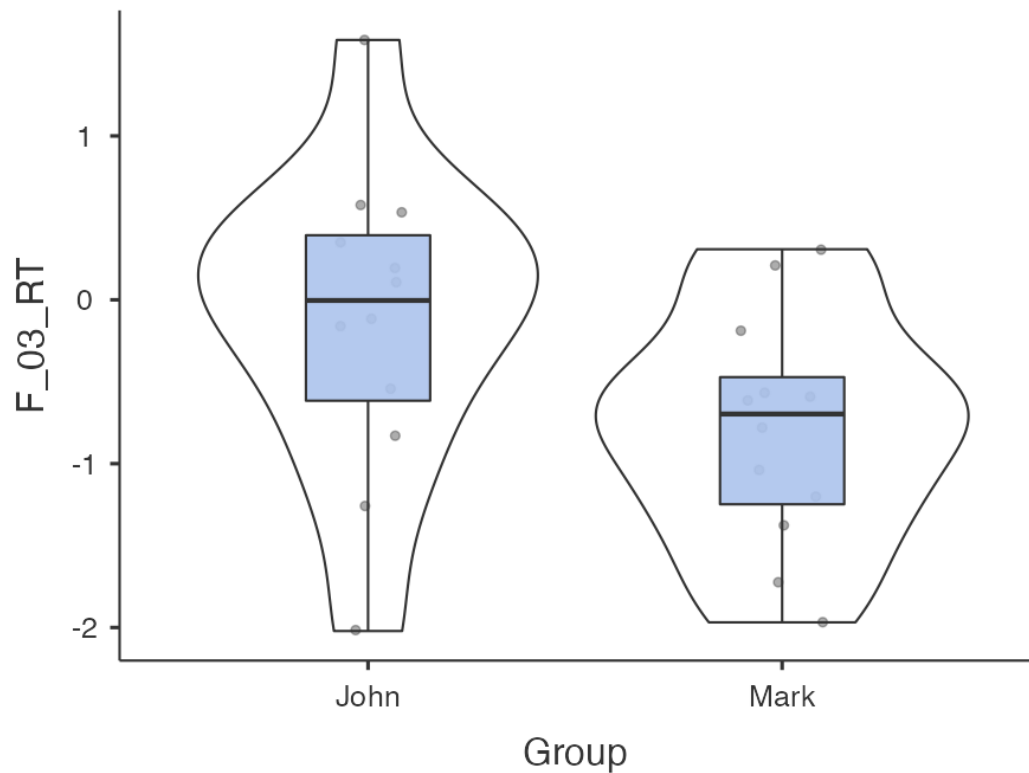


*Fig 6:* RTs trend of significance difference between groups in Fear for audio only condition.

Since the data for accuracy was not normally distributed, we used the Kruskal-Wallis nonparametric t-test to examine the effects of condition (pre and post), type of emotion (H, S, A, F, D, Su) and kind of stimuli (audio+video, video, audio) between groups (John's story and Mark's story).

Kruskal-Wallis t-tests showed a significant difference between groups for Happiness in Audio+video condition [$\chi2(1) = 4.001$, $p = 0.045$, $\epsilon2 = 0.174$)], which shows that there is a difference in recognizing Happiness. in the audio and video stimuli

presentation. There is also a significant difference in recognizing disgust in the audio only stimuli [$\chi 2(1) = 4.272$, $p = 0.039$, $\epsilon 2 = 0.186$] and for Surprise in the same stimuli presentation [$\chi 2(1) = 3.892$, $p = 0.049$, $\epsilon 2 = 0.169$] We also found a trend of significance for surprise, where except for surprise's accuracy in the audio only stimuli, the performance for everything else increased in John's group. However, there is a drop in surprise in the audio only stimuli in the post test for Mark's group. This trend of significance is driven by Mark's group for Fear [$t(22) = 1.94$, $p = 0.065$, Cohen's $d = 0.792$]. The RTs were worse post test as well.

An rm ANOVA conducted on the Likert scale answer in comparison to the groups showed that Anger was significantly lower in John's group as compared to Mark's group [Mean Difference = -2.4167, $t(22) = -7.034$, $p < .001$], as well as the ratings for Disgust, as we can see in the graph.
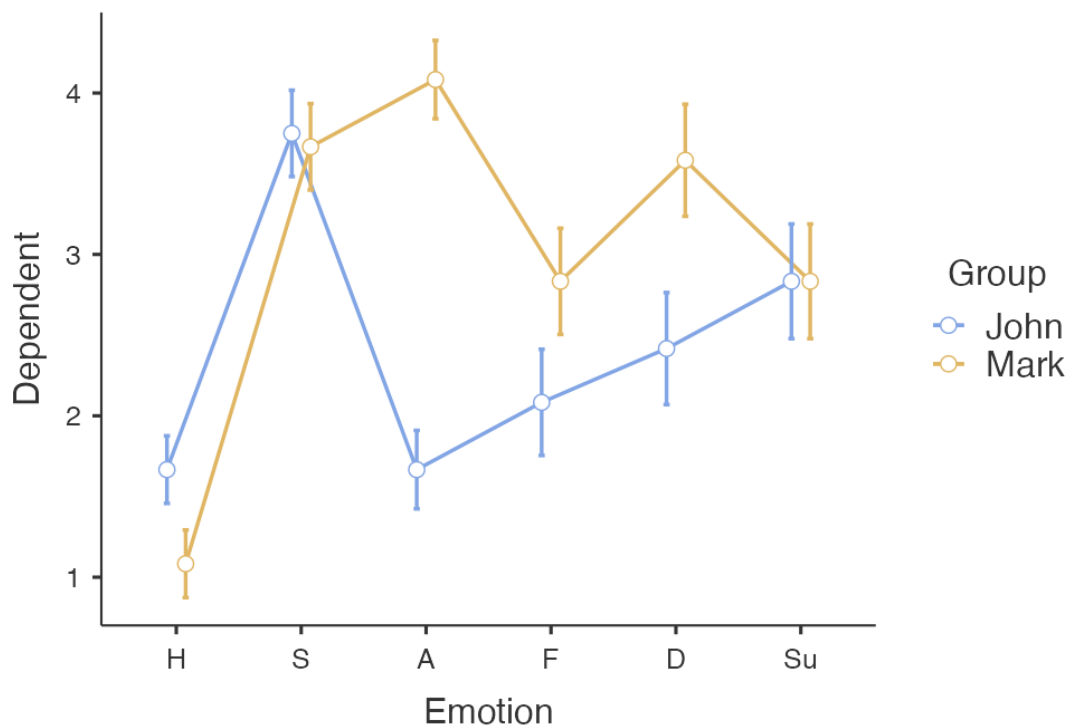
*Fig 7:* Estimated Marginal Means plots for the Likert scale answers between the two groups.

A Mann-Whitney U test was conducted which showed that there is a significant difference in Disgust Likert scores between the John and Mark groups, where we found Mark's group reporting higher Disgust Likert scores (U=34.50, p=0.029) we also found a significant difference in Anger Likert scores between the John and Mark groups where Mark's group reported significantly higher Anger Likert scores compared to the John group. (U=5.00, p<0.001p)

A correlation analysis was conducted using the Likert scale answers to the accuracy of emotion recognition in Mark's group in the post test showed a significant negative correlation in surprise Likert scale answer and sadness accuracy (p= -0.016). This shows that as the participants in Mark's group felt more surprised, they were less

likely to detect sadness post-test in audio and video stimuli as well as audio only. The test also showed a negative correlation amongst surprise in the Likert scale and accurately recognizing sadness in the audio only stimuli (p=0.009)

However, in the correlation analysis done on John's group, showed a significance in participants' fear Likert scale with disgust in audio and video (p=0.032), suggesting that the more they felt fear, the more they were able to accurately recognize disgust. Disgust also negatively correlated with surprise in the audio and video stimuli (p= 0.013) as well as anger in audio only (p=0.005). A negative correlation for disgust in the Likert scale answers also showed with sadness in the audio only stimuli (p=0.038) and fear audio only (p=0.005)

**Chapter 4: Discussion**

The primary aim of this study was to investigate if stigmatizing information regarding pedophilic disorder impairs the ability to recognize specific emotions and how this might vary across different modalities of presentation of the emotions (audio and video, audio only and video). Along with this, we sought to explore the interaction effects between the conditions (pre and post test), reaction times and the stimuli. The literature showed an abundance of evidence that suggests that if there is a stigma or bias against pedophilic disorder, the potential of inaccurately recognizing emotions like disgust and anger is high. Many of the theoretical backgrounds have also suggested that if the observer is experiencing negative emotions of any kind, the likelihood of not being able to recognize emotions accurately are high, suggesting that an interplay between the environment and biological processes have an effect on perception.

The repeated measure ANOVA that was conducted on reaction times revealed several findings. A significant main effect of condition was observer, with faster reaction times being recorded during the post-test phase compared to the pre-test. This improvement in reaction times can be attributed to a learning effect, or familiarity bias, where participants could have become familiar with the emotional recognition tasks during the pre-test, which resulted in quicker responses (Posner, & Petersen, 1990). On the other hand, we can also attribute this reduction in reaction time to a desensitization effect, where the emotional impact of the stimuli presenting the information diminished

over time, which allowed for a more rapid processing of the emotions (Lang, Bradley, & Cuthbert, 1998)

The main effect of stimuli was also significant, showing us that the type of stimuli greatly influenced reaction times. The fastest reaction times were observed in the first type of stimuli, which was Audio and video. Video only stimuli type followed this and then by the audio only stimuli conditions. This finding aligns with the current literature which suggests that integrating auditory and visual information enhances emotional processing by providing redundant cures, facilitating a faster and more accurate emotional recognition (Campanella & Belin, 2007; de Gelder & Vroomen, 2000). There was also a significant interaction between condition and stimuli, which further highlights the dynamic nature of this effect. This suggests that the modality of emotional presentation may differently impact reaction times based on the different phases of an experiment, that is if the participant is in the pre or post test phase (Laurienti et al., 2004)

Moreover, the significant main effect for emotion showed that the reaction times varied depending on the specific emotion that was being recognized. Happiness was seen to consistently elicit faster responses, which could be a result of the generally positive and unambiguous nature of happiness as an expression. (Ekman, 1992). On the other hand, emotions like fear and disgust, which might be more ambiguous, resulted in slower reaction times. This is in line with the existing literature that suggested that positive emotions are processed quicker and more efficiently than negative emotions that may require more cognitive resources to decode and interpret (Zadra & Clore, 2011).

The significant interaction between condition, emotion and group sheds light further into how stigmatized information may differently affect emotional recognition. In specific, the interaction suggests that the impact of the narrative one reaction time was

different not only by the time of emotion, but also by the groups. This was in line with the current literature that showed that participants' emotional biases to the narrative interacted with the type of emotion being recognized, which might lead to a more pronounced effect in certain conditions (Jahnke et al., 2014).

In contrast to reaction times, the analysis of accuracy did not show any significant main effect for condition, which shows that the accuracy did not significantly change between the pre-test and post-test. This suggests that while participants became faster at recognizing emotions, their accuracy did not necessarily vary through conditions, highlighting a potential trade-off between speed and accuracy in emotional processing (Wickelgren, 1977). The findings could also potentially indicate that the information presented to the participants did not significantly impair their ability to recognize emotions drastically, or that any potential effects were set off by the familiarity gained during the pre-test phase (Carroll & Russell, 1996).

However, the type of stimuli did show a significant impact on accuracy, where audio and video stimuli resulted in the highest accuracy, followed by video only and then audio only. This finding is consistent with literature on multisensory integration, which suggests that the combination of auditory and visual cues enhance the accuracy of emotional recognition providing complementary information reduced ambiguity (de Gelder & Vroomen, 2000, Campanella & Belin, 2007). The significant main effect of emotion that was shown in accuracy further grounds the complexity of emotional recognition, with certain emotions like happiness being recognized more accurately than the other emotions. This can be attributed to the fact that there are more distinct, universally recognized facial and vocal expressions that are associated with happiness, compared to more ambiguous or variable expressions of emotions (Ekman & Friesen, 1971, Izard, 1994)

The significant interaction between stimuli and emotion suggests that the modality of emotional presentation plays an important role in the ability to recognize specific emotions accurately. For example, the results indicated that disgust and surprise were more accurately recognized with the audio and video stimuli or video only stimuli compared to audio only stimuli. This finding aligns with the belief that certain emotions, especially those that involve complex facial expressions or body language, are more effectively conveyed through visual modalities (Cohen & Gunz, 2002). On the other hand, emotions like sadness and happiness were more accurately recognized in the video stimuli compared to audio and video, suggesting that the addition of auditory information may sometimes introduce what is called noise, or ambiguity, potentially leading to a slight decrease in the ability to accurately recognize these emotions (Paulmann & Pell, 2011).

The analysis of Likert scale rating revealed a significant difference in participants' emotional responses between the experimental group and control group. In specific, Mark's group, that is the control group, reported significantly higher levels of anger and disgust, consistent with the information presented in the narrative about Mark's history of physical abuse due to addiction. However, when we compare this to the Likert scale answers in John's group, it does not support the existing literature that clearly indicated that there is still a significant amount of negative emotions, such as disgust and anger, towards persons with pedophilia in comparison to one suffering from alcohol addiction. The absence of such heightened negative emotions in John's group, who were presented with the story of a man suffering from pedophilia and is a non-offender, suggests that the framing of the narrative might play a crucial role in shaping the participants emotional responses (Hastorf, Schneider & Polefka, 1970).

The significant difference in anger and disgust ratings between the group do to an extent align with prior research, which has definitely shown that these stigmatized

conditions often evoke strong negative emotions, such as anger and disgust, especially when the stigmatized individual is seen to be morally culpable or dangerous (Jahnke et al, 2014; Rozin et al., 2000). However, the discrepancy in these findings and previous literature which abundantly reported a much stronger bias against individuals with pedophilic disorder as opposed to other conditions like alcohol addiction, could be due to the specific framing of narratives used in this study. The portrayal of Mark's history of physical abuse as a result of his addiction, and the portrayal of the experiences of his wife, may have amplified the participants negative emotional responses, considerably overshadowing the literatures reported responses that are associated with pedophilia (Harper & Hogue, 2015).

The correlation analysis provided further insights into the relationship between the participants emotional states and their ability to recognize emotions accurately. In Marks group, a significant negative correlation was found between surprise Likert scale ratings and sadness accuracy. This suggests that participants who reported feeling higher levels of surprise were less accurate in recognizing sadness as an emotion. This finding could be interpreted with the backing of the embodied emotions framework, which posits that an in individuals current state can influence the perception of other people's emotions (Zadra & Clore, 2011). In this case, participants who felt more surprise maybe have been less attuned to more subtle or ambiguous emotions cues, which led to the inability to recognize emotions accurately (Niedenthal et al., 2005).

Similarly, in John's group, a significant positive correlation was found between fear's Likert scale ratings and the accurate recognition of disgust. This indicated that heightened fear may have enhanced the recognition of certain negative emotions, like disgust. This finding is in line with the notion that the negative emotional states, such as fear, can prime individuals to be more vigilant and responsive to potential threats, leading

to more accurate recognition of emotions like disgust, which are seen to be associated with aversive stimuli (Smith et al., 2006; Öhman & Mineka, 2001).

The negative correlations observed between surprise and disgust, and between disgust and sadness, further show us the complex interplay that occurs between different emotional states and their impact on emotional recognition. These findings suggest that specific emotions may compete or intervene with one another, which leads to biases or inaccuracies in the ability to accurately recognize emotions, particularly when the observer's emotional state does not align with the emotion that is being observed (Gross, 2002, Gohm & Clore, 2002).

The findings of this study are consistent with prior research on the impact stigma has on emotional recognition. The significant interaction between stimuli and emotion, as well as the observed biases in the recognition of emotions in Mark's group, align with the existing literature suggesting that stigmatizing attitudes can impair emotional recognition, particularly when the stigmatized individual is perceived as a threat or morally culpable (Jahnke et al., 2014, Phelan et al., 2008).

However, this study also provides new insights into how the role of multimodal emotional presentations is mitigating or exacerbating these biases. The finding that the audio and video stimuli resulted in the highest accuracy and fastest reaction times supports the existing literature that multisensory integration enhances emotional processing by providing complementary cues (Stein & Stanford, 2008, Laurienti et al., 2004). This finding branches out the existing literature by demonstrating that the benefits of multimodal presentation may be more apparent in situations where stigmatizing information exists and potentially counteract some of these biases (de Gelder & Vroomen, 2000).

At the same time, the discrepancies between this study's findings and previous research on emotional biases towards persons with pedophilia or pedophilic disorder highlight the importance of considering the impact of framing issues. The stronger negative emotional responses observed in Mark's group, which are attributed to the narrative's focus on physical abuse due to addiction, suggests that the specific content and framing of narratives can drastically influence the nature and extent of emotional biases (Pescosolido et al., 2010, Angermeyer & Matschinger, 2005). This finding stresses the importance for the need for future research to carefully consider the framing of information regarding stigmatized mental illness and understand its potential impact on the perception and recognition of emotions.

The results of this study provide support to the Core Affect theory and the concepts of embodied emotions. The significant correlations that were seen between the participants' emotional states and their accuracy in being able to recognize emotions suggest that an individual's core affect and embodied state can largely impact and influence their perception of others' emotions. This is consistent with Zadra & Clores (2011) findings that negative emotions can lead to the misinterpretation of neutral or ambiguous cues as negative.

Moreover, the significant interaction effects between stimuli and emotion shed light on the importance of considering the modality of emotional presentation in the study of embodied emotions. The findings that video and, audio and video stimuli enhance the recognition of certain emotions, such as disgust and surprise, could show that the integration of multiple sensory modalities may help to align the observer's embodied state with the emotions being observed, which in turn reduces the bias and improves accuracy.

A significant limitation of this study is the possibility of familiarity bias. Since participants were required to take the same emotion recognition test in both the pre-test and post test phases, the repetition may have led to the increased familiarity with the test material and could have become more adept at recognizing emotions due to repeated exposure, rather than as a result of experimental manipulation. This effect could confound the observed changes in reaction times and accuracy, making it difficult to point blank say that these changes are solely due to the impact of the bias against the disorder, or the type of stimuli used (Yonelinas, 2002, Sergerei, Lepage & Armony, 2007)). Additionally, another major limitation is the issue of framing in the narratives used to present to the participants. The study, like we mentioned earlier, found that participants expressed more feelings of disgust and anger towards Mark, whose narrative included descriptions of a physically abusive alcohol addict, as opposed to John, who was described to be a non-offending pedophile struggling with internalized issues of anxiety and self-prescribed social ostracization in order to not cause any harm to others. The framing of the narratives may have potentially overshadowed the effects of the stigma itself, making it a challenge to isolate the specific impact it had on emotional recognition (Goffman, 1963; Tversky & Kahneman, 1981). Another aspect to discuss would be the degree of subjectivity that is associated with Likert scales. As they are self-reported, there is a possibility that participants may have been influenced by social desirability bias, leading them to underreport or overreport negative emotions such as anger and disgust, particularly in the instances of sensitive topics like pedophilia and alcohol addictions along with physical abuse (Paulhus, 1984). One other limitation to consider is the fact that this study did not take into consideration individual differences in emotional intelligence, cognitive processing and or personal experiences. While the study definitely controlled for some extraneous variables, it is possible that unmeasured individual differences such as having

a higher emotional intelligence may have influenced the results, allowing them to be better equipped at recognizing emotions more accurately, regardless of the group type (Mayer & Salovey, 1997).

Future research can focus on addressing familiarity bias using different emotional recognition tests in the pre-test and post-test phases-such as with different actors or different phrases of expressions. They could also introduce novel stimuli or vary the presentation in order to reduce the chance of learning effects and familiarity bias. It is also extremely important that future research ensures no framing issues and could also potentially manipulate the framing of narratives more systematically, which would help explore how different types of narrative content (like neutral, positive, or negative) may influence emotional recognition. Future studies could also consider cross-cultural comparisons to examine how cultural norms and values influence stigma for disorders such as pedophilic disorder and its impact on emotional recognition.

Literature has definitely shown that cultural differences in the perception and recognition of emotions, along with the societal attitudes towards mental illnesses like pedophilic disorder and alcohol addiction, could influence one another (Matsumoto, 1990). Lastly, future research could also incorporate objective measures of emotional responses, such as skin conductance tests or heart rate monitors, to provide physiological indications allowing for a more comprehensive understanding of the effects stigma has on emotional recognition.

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# Appendix

## A1: State-Trait-Inventory 1

**SELF-EVALUATION QUESTIONNAIRE** STAI Form Y-1

**Please provide the following information:**

Name_____Date_____S_____

Age_____ Gender (*Circle*) **M**  **F**                    T_____

**DIRECTIONS:**

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

|  | NOT AT ALL | SOMEWHAT | MODERATELY SO | VERY MUCH SO |
|---|---|---|---|---|
| 1. I feel calm | 1 | 2 | 3 | 4 |
| 2. I feel secure | 1 | 2 | 3 | 4 |
| 3. I am tense | 1 | 2 | 3 | 4 |
| 4. I feel strained | 1 | 2 | 3 | 4 |
| 5. I feel at ease | 1 | 2 | 3 | 4 |
| 6. I feel upset | 1 | 2 | 3 | 4 |
| 7. I am presently worrying over possible misfortunes | 1 | 2 | 3 | 4 |
| 8. I feel satisfied | 1 | 2 | 3 | 4 |
| 9. I feel frightened | 1 | 2 | 3 | 4 |
| 10. I feel comfortable | 1 | 2 | 3 | 4 |
| 11. I feel self-confident | 1 | 2 | 3 | 4 |
| 12. I feel nervous | 1 | 2 | 3 | 4 |
| 13. I am jittery | 1 | 2 | 3 | 4 |
| 14. I feel indecisive | 1 | 2 | 3 | 4 |
| 15. I am relaxed | 1 | 2 | 3 | 4 |
| 16. I feel content | 1 | 2 | 3 | 4 |
| 17. I am worried | 1 | 2 | 3 | 4 |
| 18. I feel confused | 1 | 2 | 3 | 4 |
| 19. I feel steady | 1 | 2 | 3 | 4 |
| 20. I feel pleasant | 1 | 2 | 3 | 4 |

STAIP-AD Test Form Y
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## A2: State-Trait-Inventory 2

### SELF-EVALUATION QUESTIONNAIRE
#### STAI Form Y-2

Name_____Date_____

<table>
<tr><td><b>DIRECTIONS</b></td><td>ALMOST NEVER</td><td>SOMETIMES</td><td>OFTEN</td><td>ALMOST ALWAYS</td></tr>
</table>

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

| | ALMOST NEVER | SOMETIMES | OFTEN | ALMOST ALWAYS |
|---|---|---|---|---|
| 21. I feel pleasant | 1 | 2 | 3 | 4 |
| 22. I feel nervous and restless | 1 | 2 | 3 | 4 |
| 23. I feel satisfied with myself | 1 | 2 | 3 | 4 |
| 24. I wish I could be as happy as others seem to be | 1 | 2 | 3 | 4 |
| 25. I feel like a failure | 1 | 2 | 3 | 4 |
| 26. I feel rested | 1 | 2 | 3 | 4 |
| 27. I am "calm, cool, and collected" | 1 | 2 | 3 | 4 |
| 28. I feel that difficulties are piling up so that I cannot overcome them | 1 | 2 | 3 | 4 |
| 29. I worry too much over something that really doesn't matter | 1 | 2 | 3 | 4 |
| 30. I am happy | 1 | 2 | 3 | 4 |
| 31. I have disturbing thoughts | 1 | 2 | 3 | 4 |
| 32. I lack self-confidence | 1 | 2 | 3 | 4 |
| 33. I feel secure | 1 | 2 | 3 | 4 |
| 34. I make decisions easily | 1 | 2 | 3 | 4 |
| 35. I feel inadequate | 1 | 2 | 3 | 4 |
| 36. I am content | 1 | 2 | 3 | 4 |
| 37. Some unimportant thought runs through my mind and bothers me | 1 | 2 | 3 | 4 |
| 38. I take disappointments so keenly that I can't put them out of my mind | 1 | 2 | 3 | 4 |
| 39. I am a steady person | 1 | 2 | 3 | 4 |
| 40. I get in a state of tension or turmoil as I think over my recent concerns and interests | 1 | 2 | 3 | 4 |

STAIP-AD Test Form Y
www.mindgarden.com

# A3: Becks Depression Inventory

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.
    0       I do not feel sad.
    1       I feel sad
    2       I am sad all the time and I can't snap out of it.
    3       I am so sad and unhappy that I can't stand it.

2.
    0       I am not particularly discouraged about the future.
    1       I feel discouraged about the future.
    2       I feel I have nothing to look forward to.
    3       I feel the future is hopeless and that things cannot improve.

3.
    0       I do not feel like a failure.
    1       I feel I have failed more than the average person.
    2       As I look back on my life, all I can see is a lot of failures.
    3       I feel I am a complete failure as a person.

4.
    0       I get as much satisfaction out of things as I used to.
    1       I don't enjoy things the way I used to.
    2       I don't get real satisfaction out of anything anymore.
    3       I am dissatisfied or bored with everything.

5.
    0       I don't feel particularly guilty
    1       I feel guilty a good part of the time.
    2       I feel quite guilty most of the time.
    3       I feel guilty all of the time.

6.
    0       I don't feel I am being punished.
    1       I feel I may be punished.
    2       I expect to be punished.
    3       I feel I am being punished.

7.
    0       I don't feel disappointed in myself.
    1       I am disappointed in myself.
    2       I am disgusted with myself.
    3       I hate myself.

8.
    0       I don't feel I am any worse than anybody else.
    1       I am critical of myself for my weaknesses or mistakes.
    2       I blame myself all the time for my faults.
    3       I blame myself for everything bad that happens.

9.
    0       I don't have any thoughts of killing myself.
    1       I have thoughts of killing myself, but I would not carry them out.
    2       I would like to kill myself.
    3       I would kill myself if I had the chance.

10.
    0       I don't cry any more than usual.
    1       I cry more now than I used to.
    2       I cry all the time now.
    3       I used to be able to cry, but now I can't cry even though I want to.

11.
    0      I am no more irritated by things than I ever was.
    1      I am slightly more irritated now than usual.
    2      I am quite annoyed or irritated a good deal of the time.
    3      I feel irritated all the time.

12.
    0      I have not lost interest in other people.
    1      I am less interested in other people than I used to be.
    2      I have lost most of my interest in other people.
    3      I have lost all of my interest in other people.

13.
    0      I make decisions about as well as I ever could.
    1      I put off making decisions more than I used to.
    2      I have greater difficulty in making decisions more than I used to.
    3      I can't make decisions at all anymore.

14.
    0      I don't feel that I look any worse than I used to.
    1      I am worried that I am looking old or unattractive.
    2      I feel there are permanent changes in my appearance that make me look unattractive
    3      I believe that I look ugly.

15.
    0      I can work about as well as before.
    1      It takes an extra effort to get started at doing something.
    2      I have to push myself very hard to do anything.
    3      I can't do any work at all.

16.
    0      I can sleep as well as usual.
    1      I don't sleep as well as I used to.
    2      I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3      I wake up several hours earlier than I used to and cannot get back to sleep.

17.
    0      I don't get more tired than usual.
    1      I get tired more easily than I used to.
    2      I get tired from doing almost anything.
    3      I am too tired to do anything.

18.
    0      My appetite is no worse than usual.
    1      My appetite is not as good as it used to be.
    2      My appetite is much worse now.
    3      I have no appetite at all anymore.

19.
    0      I haven't lost much weight, if any, lately.
    1      I have lost more than five pounds.
    2      I have lost more than ten pounds.
    3      I have lost more than fifteen pounds.

20.
    0        I am no more worried about my health than usual.
    1        I am worried about physical problems like aches, pains, upset stomach, or constipation.
    2        I am very worried about physical problems and it's hard to think of much else.
    3        I am so worried about my physical problems that I cannot think of anything else.

21.
    0        I have not noticed any recent change in my interest in sex.
    1        I am less interested in sex than I used to be.
    2        I have almost no interest in sex.
    3        I have lost interest in sex completely.

**A4: John's narrative (Experimental group text)**

**The Hidden Struggles of Pedophilia: A Silent Battle**

Pedophilia is a deeply stigmatized condition that remains shrouded in misunderstanding and secrecy. This article delves into the life of an individual living with this condition, shedding light on the profound internal struggles and societal challenges they face.

Meet John, a 45-year-old man who has quietly battled disturbing thoughts for most of his adult life. John's story is one of inner turmoil and isolation, revealing the harsh realities of living with a condition that society often meets with condemnation and fear.

John's journey began with fleeting, troubling thoughts that he could not control. These thoughts, which centered around children, caused him immense distress and guilt. As they became more persistent, John withdrew from social interactions, particularly those involving families and children, to avoid situations that might trigger his anxiety.

For John, the internal battle was relentless. The fear of being discovered or acting on these unwanted thoughts consumed him. He lived in a state of constant vigilance, always aware of his surroundings and his behavior. This hyper-awareness took a toll on his mental health, leading to severe anxiety and depression.

John's life became a series of evasive maneuvers. He avoided parks, schools, and other places where children might be present. His social circle dwindled as he distanced himself from friends and family, fearing judgment and rejection if his secret were ever revealed. Conversations with his friends about family or children were one he avidly started avoiding, causing little to no interaction with his peers. The isolation deepened his sense of loneliness and despair.

Despite the relentless nature of his thoughts, John made a conscious and unwavering decision not to act on his urges. He understood the moral and legal implications and was determined to prevent any harm. John refrained from consuming any form of illegal material, including child pornography, to satiate his desires. Instead, he sought alternative ways to cope, such as engaging in rigorous physical exercise and immersing himself in work and hobbies.

Despite his struggles, John never sought professional help.

The stigma surrounding pedophilia made him afraid of potential consequences, such as being labeled a criminal or losing his job. He lived in silence, suffering alone and without support.

**A5: Mark's narrative (Control group text)**

**The Dark Side of Alcohol: A Story of Domestic Violence**

Alcoholism is a pervasive issue that can lead to devastating consequences, particularly within the home. This article delves into the life of an individual whose struggle with alcoholism resulted in violent outbursts and domestic violence, shedding light on the profound impact of this condition on both the sufferer and their loved ones.

Meet Mark, a 38-year-old man whose battle with alcohol addiction turned his home into a battleground. Mark's story reveals the destructive power of alcohol and the urgent need for intervention and support.

Mark's relationship with alcohol began in his early twenties as a way to cope with the pressures of work and personal life. What started as occasional drinking soon escalated into a daily habit. By his thirties, Mark's alcohol consumption had spiraled out of control, affecting his job, health, and most tragically, his family.

The more Mark drank, the more he struggled with controlling his emotions. Small disagreements quickly turned into heated arguments, and under the influence of alcohol, these arguments often escalated into physical violence. Mark's wife, Lisa, and their two children lived in constant fear of his unpredictable outbursts. The cycle of violence in Mark's home followed a distressing pattern. After a bout of drinking,

Mark would become irritable and prone to explosive anger. His violent outbursts were triggered by minor incidents, often leaving Lisa and the children physically and emotionally scarred.

For Lisa, the bruises and injuries were only part of the torment. The psychological trauma of living with an abusive partner eroded her sense of self-worth and left her feeling trapped. The children, too, suffered immensely. They lived in a state of perpetual anxiety, their home a place of fear rather than safety. Mark's violent behavior created a tense and volatile environment. The unpredictability of his outbursts meant that Lisa and the children were constantly on edge, trying to avoid actions or words that might provoke his anger.

The once-loving home became a place of dread and survival. Lisa often found herself making excuses for Mark's behavior to friends and family, ashamed and fearful of the

stigma and repercussions if the truth were known. The isolation compounded her despair, leaving her with no safe space to turn to.

**A6: Likert-Scale questionnaire for John's group (experimental group)**

1.Reading about John's story evoked feelings of sadness in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

2.Reading about John's story evoked feelings of happiness in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.I was surprised by the details of John's internal struggles.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

4.I felt fear after reading about John's story.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

5.John's story evoked feelings of disgust in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

6.I felt angry after reading about John.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

**A7: Likert-Scale Questionnaire for Mark's group (Control Group)**

1.Reading about Mark's story evoked feelings of sadness in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree


2. Reading about Mark's story evoked feelings of happiness in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree


3.I was surprised by the details of Mark's violent outbursts and the impact on his family.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree


4.I felt fear after reading about Mark's actions.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

5.Mark's story evoked feelings of disgust in me.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

6.I felt angry about the effects of Mark's behavior and the suffering of his family.

○ Strongly Disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree