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Understanding the Dynamic States of Fear and Arousal and its Manifestation in Abusive Circumstances

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Abstract

As human beings, we know anything because it gets reflected on our senses - "I know this bag is black because I can **see** that it is black" or "I know the music is loud because I can **hear** that the music is loud." There is a connection present with our senses, and this connection goes up to the brain. The brain interprets the data that the senses have sent and accordingly commands the associated systems in the body to respond. Fear is our response to threatening situations, while arousal is a state of vigilance that allows us to respond to a situation either by retreating from it or seeking it as a source of pleasure. The chemical response to both states leads to confusion, because neurotransmitters involved in fear and arousal are the same, i.e., norepinephrine and dopamine. This research paper studies 75 adult participants who answered a questionnaire on verbal abuse and emotional negligence that had taken place during their childhood. We understand the unconscious arousal that covers a fear response in an abusive situation leading to a victim enduring their abuser obediently. The questionnaire used to conduct this research was generated by the authors. It consists of 3 subscales and each item is carefully fabricated to understand different aspects of childhood abuse, Arousal and its impact on adult relationships. The results of this study have indicated positive correlations among all three subscales, hence proving the hypothesis that one might get seduced into loyalty from what they fear.

Keywords: Fear, Arousal, Amygdala, Abuse

Are we seduced by what we fear?

Fear may be defined as the neurophysiological process that prepares an organism to perform innate or learned responses to cope with danger. Studies of the amygdala in humans have concluded this structure to be involved within the recognition, expression, and knowledge of fear. Through human neuroimaging, we have observed the amygdala to activate not only high anxiety provoking situations but also by many pleasant or unpleasant stimuli. Circumstances including sexual stimuli or one's favorite song tends to activate the amygdala in the same manner. (Adolphs, 2013)

Fear and the amygdala

Understanding the neurophysiology of fear, McGaugh and Roozendaal (2002) found that the basolateral amygdala is responsible for the release of arousal related neurotransmitters, namely norepinephrine and dopamine. When interpreting a threatening stimulus, the part of the brain that gets activated in fear processing is the amygdala and structures connected to it. The basolateral amygdala receives sensory inputs involving fear.

The central nucleus of the amygdala is the main regulator to mediate responses to fearful situations. Activation of the amygdala further initiates motor functions involved within the fight-or-flight response and the release of stress hormones triggering the sympathetic nervous system as well as the adrenal glands.

This Research paper is on ***'Fear and Arousal'*** and has been authored by ***Anil Thomas.***

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Activation of the fear response initiates the adrenal gland to release epinephrine and other catecholamines into the blood. The body releases cortisol responding to ACTH, which increases blood pressure, blood glucose, and white blood cells.
Cortisol turns fatty acids into energy for the muscles. Catecholamine hormones, epinephrine and norepinephrine, prepare muscles for violent action. This further results in physiological changes in the body like, pupils dilating, breathing accelerates, pulse and blood pressure increases, and the digestive system slows down.

Arousal

Arousal is a requirement for all cognitive functions and emotional expression. Arousal mechanisms in the CNS are well known at the neuroanatomical level. Five neurochemically definite systems collaborate to increase arousal, using norepinephrine, dopamine, serotonin, acetylcholine and histamine as transmitters. Starting from the brainstem and converging in the basal forebrain, they overlap and cooperate. Their abundance is what keeps failure at bay.

Stress is an agent of the emotion, fear. Stress is manifested by an adaptive syndrome that works in the direction of returning to the unchallenged state of the body. Similarly, arousal is a state, manifested by the stimulation of behavior. There exists an asymmetric relationship between arousal and fear that acts as a medium to stress and stress-related response. It is viable to have arousal without fear. But it is not possible to have fear without arousal.

Neurotransmitters inducing Arousal and Fear

Arousal is the physiological and psychological state of being awake. Being in a state of fear automatically means being in a state of high arousal but the state of arousal can be achieved by itself also. Adrenaline and noradrenaline participate in generalized arousal of the CNS, which is why the physiological response to an arousal state is also increased heart rate, blood pressure, pupils dilating, difficulty to breathe, a condition of sensory alertness, desire, mobility and readiness to respond. Stone et al. have studied alpha-1 adrenoceptors' function in positively motivated circumstances and in inhibited behavioral circumstances. The difference is in where the receptor is located. Sites such as the lateral hypothalamus, the nucleus accumbens, and the piriform cortex activate positive behavioral explorations. However, sites such as the paraventricular hypothalamus and the central nucleus of the amygdala are associated with fear, stress, depression, etc.

Sensory systems direct arousal pathways indicating vestibular, somatosensory and auditory stimuli, and taste stimuli causing arousal to an animal or human being. Often pain pathways and sexual stimulation on the skin overlap, and inhibit the possibility of high arousal. In contrast, impulses triggered by odor stimulation reach the brain through tracts in the basal forebrain, projecting to a receiving zone connected with high degree of arousal, during both sex and fear.

Literature Review

Pavlovian reward cues, even if they aren't present, may still be 'wanted'. The intensity of 'wanting' triggered by reward cues can be regulated by states of brain mesocorticolimbic circuitry, and can be influenced by relevant physiological states such as hunger or thirst, by stress, drugs of abuse, etc.

A study in 2014 examined the significance of the central nucleus of the amygdala (CeA) in detecting an environmentally salient stimulus: a shock prod. It was predicted that both groups would exhibit fearful behavior. Contrastingly, rats did not fear the shock prod. Instead, they pursued it. The results conclude that optogenetic activation of CeA-related circuitry produces narrowly focused yet intense motivation to pursue a reward. However, it also shows a 'maladaptive' feature of this CeA-generated intense motivation that might be shared with addiction, as the motivation enhancement was towards a threatening and harmful stimulus.
(Robinson et al., 2014)

A stimulus with aversive properties can become an incentive target when paired with limbic activation, which compels the rats to repeatedly endure shocks. The shock from the rod was itself an induced attraction, however an identical 'dummy rod' without shock failed to become attractive. Thus, this study may provide the strongest proof of the principle demonstration of 'wanting what hurts'. That strong 'wanting' can be induced in the absence of 'liking'. (Warlow et al., 2020)

Fear and Arousal in the parent-child dynamic

In a systematic relationship between two or more people, i.e. when one's action is dependent on the other, when a tyranny arises, dependency occurs and the dynamic is either fear based or reward based. When it is fear based, the question that arises is, why is the victim obediently following the abuser? We hypothesize that on an unconscious level, one's brain might confuse response to fear and respond in an aroused manner. To explore this phenomenon we are testing this hypothesis in a parent - child relationship dynamics, where a child has endured emotional abuse at the hands of a parent(s). We predict that the unconscious arousal that takes place in childhood,

who is conditioned to abusive environments, leads to an attraction that comes up in adulthood with an archetypal presentation of the parent(s). This childhood conditioning further affects adulthood relationships because these people tend to be unconsciously attracted to the abusive situation. The neurotransmitter systems that were triggered back in childhood, the brain seeks, unconsciously, for the same environment conditions that in their mind is the "ideal" of attachment and attraction in any type of relationship.

A caregiver's response to attachment, exploration and fear is an important aspect of these interactions. While complex in nature, the caregiving system can sometimes turn contorted, as was noted by Bowlby as well. Pbe the safety net for their children, or worse, they tend to harm the children themselves. From a child's perspective, threat and outcomes include how their caregiver responded to them as well, the fearful arousal. Lieberman spoke on early attachment about how young children's overt lives are set around their emotional relationships. The affective characteristics of their experience shape their sense of self, their trust in others, embodying who they become and their eagerness to learn about the world. When the child cannot feel safe because the parent is consistently unavailable, unpredictable, or frightening, the basic conditions that promote early mental health are severely undermined. (Lieberman & Van Horn, 2008)

We explore this dynamic while focusing on two specific kinds of abuse, that is verbal abuse and emotional rejection. **Verbal abuse** : verbal harassment, which can be induced in different ways like: Belittling - verbal behaviors which make the child feel inferior and worthless. Humiliating - shaming the child for every unacceptable speech or behavior. Nominating - naming the child faultily and mockingly. Criticizing - criticizing all of the child's behavior as faulty or wrong. **Emotional Rejection** : refusing to accept the child and to prepare a warm and loving environment for the child.

Methodology

Sample

Taking a sample size of 75 participants, who are adults and the single child in the family. The participants of this study fall between the ages of 18 - 48. More than half the participants were women (71%). All participants proceeded with the study with informed consent.

Inclusion criteria

- Provide valid informed consent prior to answering the questionnaire
- Male or female subjects age 18 to 50 years old
- Must be a single child in the family

Exclusion criteria

- Participant fails to check the informed consent box
- Male or female subjects under the age of 18
- Participant having siblings

Tools used

The material used to conduct this study is a questionnaire consisting of 30 questions that have 3 subdivisions. The first division attempts to understand how much the participant was exposed to verbal abuse and emotional negligence in their childhood by one or both parents. The Cronbach Alpha for this study is .948. The next division assesses a child's reasoning towards enduring verbal abuse and emotional negligence. This part explores the unconscious arousal that partakes in an abusive scenario. The Cronbach Alpha for this study is .745. The final division attempts to understand the impact of this abuse and its conditioning in childhood on the adult participant's romantic relationships. The Cronbach Alpha for this study is .897.
The questionnaire in annexure.

Research Design

Moving forward with a quantitative approach, with regards to our hypothesis, it was important to obtain a positive correlation among all 3 subscales. A survey was conducted to collect responses by broadcasting the google form to different social groups. For this correlational study, we assessed our primary hypothesis of a relationship between fear and arousal and its impact on relationships using the Pearson correlation coefficient. The statistical significance of the correlation coefficient was assessed using a t test.
Null Hypothesis
$H0_1$: There will be no significant association between gender and abuse.
$H0_2$: There will be no significant association between gender and arousal.
$H0_3$: There will be no significant association between gender and relationships.
$H0_4$: There will be no significant association between age and abuse.
$H0_5$: There will be no significant association between age and arousal.
$H0_6$: There will be no significant association between age and relationships.

Objectives

The objective of this scale was to understand the degree of childhood verbal abuse and emotional rejection, how an individual would cope with the abuse - if it pointed towards unconscious arousal, and further how the abuse and their coping mechanisms implant themselves in their romantic relationships as an adult.

Results

In order to prove our hypothesis, it was necessary to obtain a positive correlation between all three subdivisions of the scale.

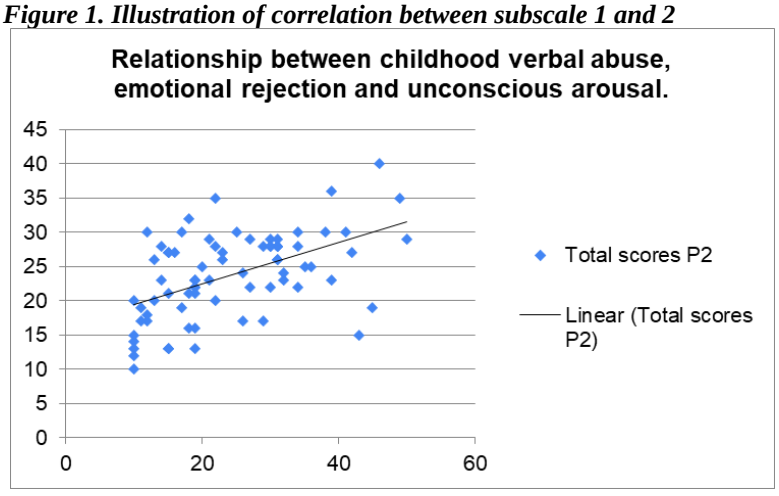
Table 1. Correlations table

		Total scores P1	Total scores P2	Total scores P3
Total scores P1	*Pearson Correlation*	1	.514**	.584**
	Sig. (2-tailed)		<.001	<.001
	N	75	75	75
Total scores P2	*Pearson Correlation*	.514**	1	.368**
	Sig. (2-tailed)	<.001		.001
	N	75	75	75
Total scores P3	*Pearson Correlation*	.584**	.368**	1
	Sig. (2-tailed)	<.001	.001	
	N	75	75	75

**. Correlation is significant at the 0.01 level (2-tailed)

Associate between childhood verbal abuse, emotional rejection and unconscious arousal Simple linear Pearson correlation was used to test whether childhood verbal abuse and emotional rejection affects our mind to unconscious arousal towards our abuser. It has been seen that there is a significant positive correlation between childhood abuse and unconscious arousal, **r (75) = .514**, p<.001** (Table 1). This suggests that higher the form and intensity of verbal abuse and emotional rejection in one's childhood, more the brain's response to it with unconscious arousal leading to the victim's obedience towards their abuser.

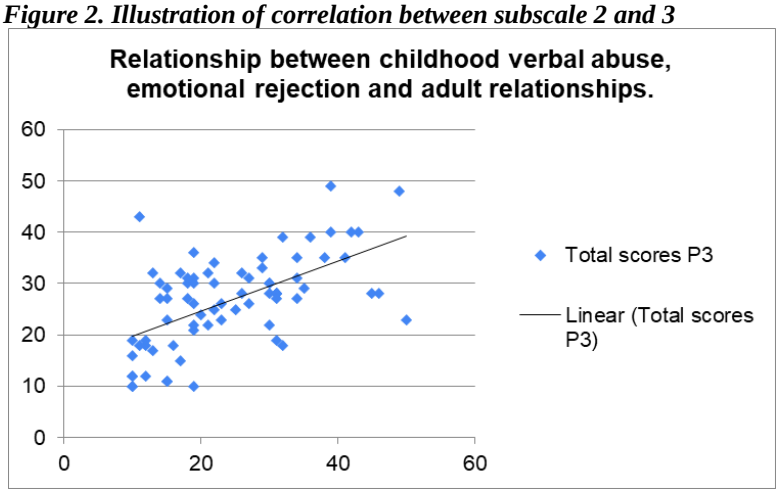
Figure 1. Illustration of correlation between subscale 1 and 2



Associate between childhood verbal abuse, emotional rejection and its impact on adult relationships

Simple linear Pearson correlation was used to test whether childhood verbal abuse and emotional rejection impacts the participant's romantic relationships in adult life. It has been seen that there is a significant positive correlation between childhood abuse and unhealthy patterns in adult relationships, **r (75) = .584**, p<.001** (Table 1). This suggests that the more the abuse in one's childhood, the more it leads to an individual to end up in similar abusive patterns in all their relationships that extend into their adult life.

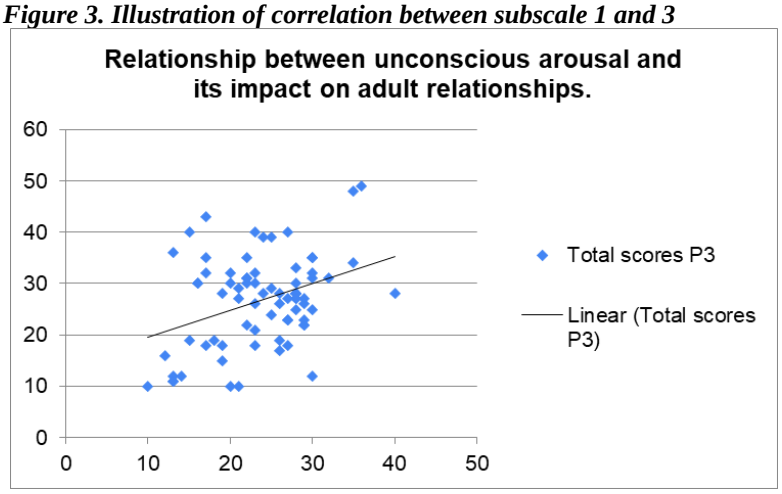
Figure 2. Illustration of correlation between subscale 2 and 3



Associate between unconscious arousal and its impact on adult relationships

Simple linear Pearson correlation was used to test whether unconscious arousal further impacts the participant's romantic relationships in adult life. It has been seen that there is a significant positive correlation between unconscious arousal and unhealthy patterns in adult relationships, **r (75) = .368**, p<.001** (Table 1). This indicates that the more unconscious arousal response that our brain emits in abusive situations in childhood, it further increases and seeks out for similar abusive patterns in their adult relationships. An unconscious pull towards abuse leads to the brain's original response of obedience to abuse.

Figure 3. Illustration of correlation between subscale 1 and 3



Discussion

The aim of conducting the study was to understand the motivations behind an individuals' decided obedience towards their abuser. And the results show that participants who endured a childhood with verbal abuse and emotional rejection, source of abuse being parental, have indicated a trend of reasoning triggered by unconscious arousal. In a systematic relationship between two or more people, i.e. when one's action is dependent on the other, when a tyranny arises, dependency occurs and the dynamic is either fear based or reward based. A parent-child relationship falls under such dynamics, where the parent holds the position of power being older, stronger and much more independent than the child who is dependent on their parent for survival. Now, since the nature of the relationship itself is fearful; one has endured verbal abuse and emotional rejection at the hands of their parents whose opinion and approval matters the most for guidance in life; the child's response to such threat ideally should lead to fight-or-flight, but that is not the case. Instead the child remains to be a victim of abuse and continues to comply with what his/her parents want. The neurochemical response of the brain tricks the child to feel that they are to gain the blanket of care and safety that every child naturally wants from their caretaker, only if they accept and comply with the abuse.

This behavior seems to extend itself into the victim's adult life as well. Childhood conditioning creates the environment for all future adult relationships. So, when a child seems to unconsciously accept parental abuse, the mind gets conditioned to perceive such a response to abuse, even in adult relationships, to be normal. A relationship for such an individual is laced with seeking outside validation, harsh criticism and troubles identifying and expressing their emotions. Objectively, they may be aware that

these are not healthy patterns, however, the brain seeks the familiar. The body, addicted to certain emotional states, neurotransmitters and stress hormones unconsciously seek dynamics where the same emotional environment exists.

When children are neglected or rejected by their attachment figures, they tend to create negative mental characterizations of themselves, others, and relationships that are congruous with such treatment and unconsciously put up with maladaptive ways of regulating emotion and interactions. Thus, early interactions with caregivers that are insensitive, unresponsive, or emotionally abusive creates a risk for insecure adult romantic attachment style, psychological difficulties, and relationship dysfunction marked by emotional mistreatment. (Riggs &
Kaminski, 2010)

While conducting this study, having reached out to people personally, it has been understood that often, participants who have endured some form of abuse in their childhood, hesitated to participate in the study. They were explained that their participation is completely voluntary and they were allowed to leave at any point. As important as the topic is, we understand that this proves to be a sensitive topic for many, and it should be approached with careful consideration.

Conclusion

Observing the results of this study, one can conclude that understanding unhealthy patterns and their origin becomes important to break out of abusive cycles. Childhood trauma is something that leaves long lasting effects on one's life, and it needs to be navigated with informed awareness. There needs to be more research studying the relationship between fear and arousal. Abusive dynamics exist in many forms in our environment, for example, domestic abuse between husband and wife, girlfriend and boyfriend. Might even apply on a larger scale for instance, to understand why tyrants like Hitler gained a mass of loyal followers knowing the nature of his abuse. This is a topic that needs to be approached with sensitivity but proves to be an important one to look into.

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Annexure:

Part I:

- In my childhood, I was frequently fighting with my parent(s)
- In childhood, my parent(s) spoke to me in such a way that made me feel devalued
- I was made to feel guilty, whereas my parent(s) played the victim in every situation
- My parent(s) participated in name-calling to belittle me
- My parent(s) often threatened me into compliance
- I was ridiculed by my parent(s) on a daily basis
- My comments or suggestions were never taken into consideration by my parent(s)
- My feelings towards my parent(s) were always rejected by them
- My parent(s) behavior towards me was always cold
- I always felt ashamed to share my achievements with my parent(s)

Part II:

- In every fight with my parent(s), I was always on the wrong side
- My parent(s) constant criticism was their way of pushing me to do better
- Regardless of how they spoke to me, obeying my parent(s) was the right thing to do
- Being belittled by my parent(s) helped me establish my identity
- If my parent(s) did not threaten me into compliance, I would have been an undisciplined child
- Getting ridiculed by my parent(s) motivated me to change myself constantly
- If my comments and suggestions were not taken into consideration, by my parent(s), they were most probably wrong
- If my feelings were rejected by my parent(s), it was because I was not expressing it properly or in the right manner
- When my parent(s) behavior towards me was cold, it was because I deserved it
- If my achievements were not appreciated by my parent(s), they did not mean anything

Part III:

- When my partner is mad at me I always blame myself for it
- I feel the need to constantly prove my worth to the people I am romantically involved with
- I struggle to express my feelings with my partner
- I feel like my achievements are nothing compared to my partner's achievements
- In all of my past relationships, I have felt devalued
- Whenever I have been treated badly in a relationship, it is because I deserved it
- Every time I have been rejected, I find faults in myself for it
- When my partner is being kind to me, I feel like I don't deserve it
- I find it difficult to accept compliments from my partner
- I find it difficult to bring up my needs with my partner