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# Neuro-Cognitive Correlates of Sexual Offences - A Systematic Review

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***Abstract:*** ***The study aimed to identify the neurocognitive correlates of sexual offences. A qualitative descriptive approach was undertaken and the design of Systematic Review was used. A total of 1856 researches were initially identified and were brought down to 76 following the criteria and finally 9 papers were undertaken after manually assessing them. The results showed a significantly high relationship between cognitive deficits and commission of sexual offences. A relationship was also found between frontal cortex especially the prefrontal pathology and commission of sexual offences. Executive functioning, verbal reasoning and cognitive control were very high in sexual offenders. Sexual offenders of adults and non-offenders had similar cognitive functioning compared to offenders of children who scored lower in neurocognitive tests. The use of forensic neuroscience in the criminal evaluation set up needs to be increased for successful identification of such cases and further studies of structural changes and functional changes of the brain are required to conclusively prove the role of neural systems in commission of sexual offences.***

***Keywords: Sexual Offence, Offenders, Neurocognition, Paraphilia, Pedophilia.***

## I. INTRODUCTION

Sexual Offence is said to have been committed when then there is sexual contact involving either physical or psychological coercion of one or more individuals without consent or those illegible to provide consent. Molestation and rape are some of the most widespread forms of sexual offenses found throughout the globe

Most sexual offenders tend to have either one or more paraphilia such as pedophilia, Voyeurism, Exhibitionism Frotteurism, etc. A majority of individuals suffering from paraphilia are males due to which the higher number of both incarcerated and under trials offenders of sexual assaults are males in comparison to the smaller number of females. (Fedoroff et al., 1999)

There are multiple causes that could lead to individuals being sexual offenders ranging from socio-cultural background, and upbringing to internal and biological factors such as heredity and brain functioning. Forensic neuroscience is the science dealing with the neurobiological/cognitive aspects that lead to criminal activities. This paper seeks to understand how neurocognitive aspects can influence the possibility of committing sexual offenses.

## II. METHOD

### *A. Rationale and Purpose*

An increasing number of sexual crimes in India and abroad are leading to evaluate the role of Neurocognition in committing sexual offenses.

Minimal studies into Neural Psychopathology of sexual offenders

Legislative failures to curb occurrence of sexual offences

### *B. Objectives*

To identify the role of neural networks and cognition in committing sexual offenses

To provide necessary suggestions

To identify research gaps in the existing studies

To identify the future scope and potential areas of research

### *C. Research Design*

The study is following the Descriptive Research Design and is using the method of Systematic Review.

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*D. Inclusion Criteria*

*1)* Original articles published in English
*2)* Must have the variables mentioned as key words or as variables in the study
*3)* Both quantitative and qualitative research were taken for the study
*4)* Must be published between 1990-2023
*5)* Google Scholar was used to identify various sources and journals along with NCBI, APA Publication, Research Gate, Pub Med and other sources of psychology academic resources
*6)* The studies were later filtered based on relevance

*E. Sample and Procedure*

A total of 1856 research and Case studies were identified. Following on the inclusion and exclusion criteria the studies were filtered. The remainder of 76 articles were manually reviewed based on the abstract for further relevance to the study. Data was collected from 9 researches that were highly relevant to both criteria and aims and tabulated. Data was manually analyzed to find significance and relationship between the neurocognitive pathways and sexual offenses.

## III. RESULTS

This chapter discusses the key findings from each of the research that was analyzed.

Table 1

Brief Summary of Research evaluating Neurocognitive causes of Sexual Offences

| Author and Year | Evaluation Group | Comparison Group | Test or Evaluation Method | Summary of Findings |
|---|---|---|---|---|
| Rodriguez et al., (2017) | First-Time Sexual Offenders (FTSO)- 32<br>Historical Long Term Offenders (HSO)- 36 | Non Sex Offenders (NSO)- 32 | Battery Of Neuropsychological Measures | 1. Impaired executive function such as verbal fluency and verbal memory.<br>2. Cognitive Deficits showed higher probability of sexual offending. |
| Langevin and Curnoe (2008) | Sexual Offenders and Paraphilics (SOPs)- 1,180 | Non Sexual Offenders- 113 | Halstead-Reitan (HR) Neuropsychological Battery | 1. Offenders against adults and control group had similar cognitive functions.<br>2. Offenders against children had higher deficits compared to other groups. |
| Hoaken et al., (2007) | Violent Offenders-20<br>Non Violent Offenders- 20 | Control- 20 | 1. Conditioned Non-spatial-Association Test<br>2. Concrete Subject-Ordered Working Memory Test<br>3. Abstract Subject-Ordered Working Memory Test<br>4. Facial affect recognition task | 1. Offending groups performed poorly in tasks.<br>2. Violent offenders performed poorly compared to non-violent offenders.<br>3. Scores were significantly related to executive deficits. |
| Rosburg et al. (2018) | Contact Child Sexual Offenders-21 Males<br>Non-Contact Child Sexual Offenders- 19 Males | Control-21 Males | Go/No-go task | 1. The response inhibition, processing of stop signals, and error detection are not impaired in Child Sexual Offenders<br>2. Less cognitive resources are used for evaluating errors committed. |
| Kruger and Schiffer (2011) | Pedophile Inpatients-20 (9 attracted to females, 11 attracted to males) | Control 28 (14 heterosexuals, 14 homosexuals) | Neuropsychological tests- Wechsler Adult Intelligence Scale, the WCST, d2 Attention-Deficit Test and Corsi block-tapping test<br>Personality Test- MMPI 2, MSI | 1. In comparison to control group, pedophiles show-<br>Impaired Neurocognition, low intelligence and information processing,<br>High levels of Psychopathy and Paranoia,<br>Sexual obsessiveness and dysfunction. |
| Tost et al. (2004) | Convicted Pedophiles- 3<br>Non convicted Pedophile- 1 | nil | Frontal Cognitive Tasks- test battery for the assessment of attention TAP, | 1. Low results in at least 3 of 5 tests Neurocognitive functioning<br>2. Impaired Prefrontal cortex and Motor circuits |

| | | | | |
|---|---|---|---|---|
| | | | WCST.<br>Non frontal Cognitive Task-(Reduced Wechsler Intelligence<br>Scale, WIP, Corsi-span | 3. Deficits in response inhibition, Working memory and Cognitive Flexibility. |
| Flor-Henry et al. (1991) | Pedophiles- 52<br>Incest Offenders- 30<br>Hebephiles- 14 | Control-46 | Electro encephalogram analysis on WAIS-R: Vocabulary and block Design | 1. Increased Frontal delta theta and alpha power in verbal processing<br>2. Reduction in interhemispheric coherence<br>3. Increase in Inter-Intra hemispheric coherence during verbal processing compared to control |
| Joyal et al. (2013) | 23 Neuropsychological studies on 1756 participants. | nil | Meta-Analysis | 1. Sex offenders against children have lower cognitive functioning in executive functioning compared to sex offenders against adults who scored low in verbal fluency and inhibition.<br>2. Sex offenders against adults have similar cognitive functioning as control groups |
| Adjorlolo and Egbenya (2016) | 24 Research articles (19 published, 5 unpublished) | nil | Systematic Review | 1. Reduced Cognitive flexibility and inhibition of interference among adult male sexual offenders.<br>2. No executive functioning deficits among juvenile sexual offenders |

A total of 9 Research were analyzed for this study. Child sexual offenders and Pedophiles were the most highly studied group of sexual offenders followed by sexual offenders of adults.

A majority of the studies undertook various neuro cognitive tests such as WAIS, WCST to evaluate the neuro cognition of the participants. Descriptive studies undertook methods of meta-analysis and systematic reviews to understand causes of sexual offences.

The findings show that a majority of sexual offenders and pedophiles suffer from cognitive deficits. There is significant impairment in executive functioning of sexual offenders. Offenders against adults showed similar test results as non-offenders showing normal cognitive functioning however offenders against children had lower results compare to offenders against adults and non-offenders. Pathology in frontal cortex was highly recognized and associated with probability of sexual offence.

## IV. DISCUSSION

While there is no specific cause that can be identified for commission of sexual offences there are various factors that could be pinpointed that influence the committing of sexual offences. Multiple theories ranging from cognitive to behavioral to learning have provided various hypothesis for sexual crimes (Faupel & Przybylski, 2015). For the neurocognitive causes it was identified that pathology in the frontal cortex has a significant role in commission of sexual crimes with specific isolated parts identified as the prefrontal cortex being the most significant. Other parts that were significant were the posterior parietal cortices, left frontal cortex and motor circuits along with the amygdala whose association was seen in cases of violent sexual offences with lack of social cognition (Johnston & Ward, 1996). As this study has identified that there is a significant relationship with brain pathology and sexual offences it is necessary that legislature looks into these factors while framing necessary laws. As such posing stringent laws may seem plausible as justice, it will, in no way help reduce or diminish the rising cases of sexual offences. As such it is important to identify cases beforehand and provide necessary treatment and rehabilitation to prevent occurrences. Furthermore, increased awareness, easy access to mental healthcare and de-stigmatization of consensual sex and sexual activities can help reduce the occurrence of sexual crimes.

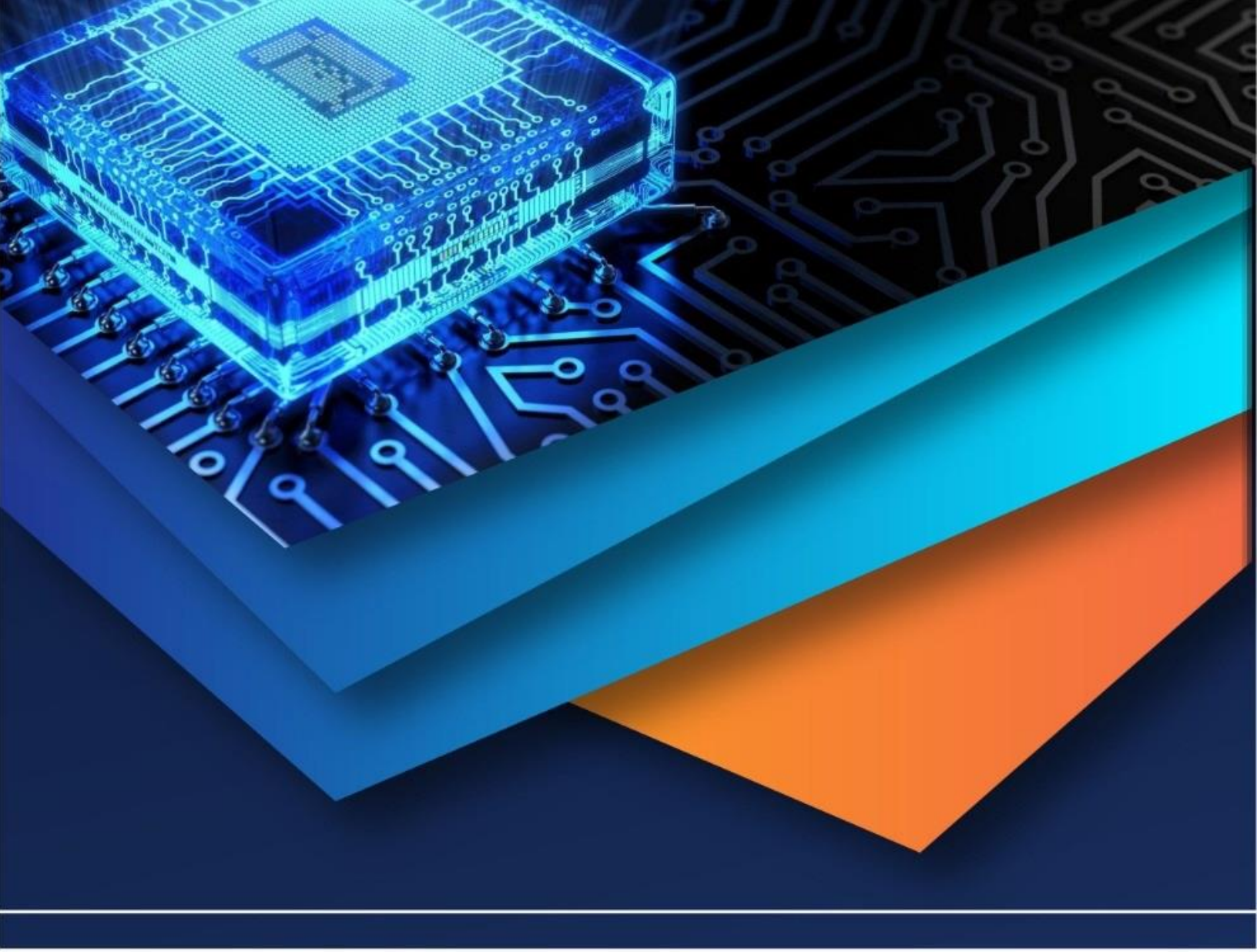
## V. CONCLUSION

The review of research showed that there was a positive relationship between Neuro Cognitive Pathology and sexual offences. Pathology in the Prefrontal Cortex was identified as a key region leading to the commission of sexual offences. As such it is recommended to emphasize on early identification and treatment of such pathology instead of setting up stringent legislative rules to overcome the rising sexual offences. The use of forensic neuroscience in the criminal evaluation set up needs to be increased for successful identification of such cases. Finally, further studies of structural changes and functional changes of the brain are required to conclusively prove the role of neural systems in commission of sexual offences.

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