Neurobiological Issues, Morality, and Pedophilia

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Inhibition-Related Brain Activation is Associated with Sexual Offending against Children in Pedophiles

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Neurobehavioral models of pedophilia and child sexual offending (CSO) suggest a pattern of temporal and in particular prefrontal disturbances leading to inappropriate behavioral control and subsequently an increased propensity to sexually offend against children. However, clear empirical evidence for such mechanisms is still missing and in this light the assessment of neuroimaging methods may be of high relevance. Within the framework of the German multi-site research network NeMUP-North, the present study was designed to assess the neural and behavioral correlates of response inhibition using a go/nogo paradigm in combination with functional magnetic resonance imaging (fMRI). During this task, subjects are required to respond as fast as possible to frequently occurring go stimuli, but have to inhibit their responses when infrequently nogo stimuli were presented. We compared behavioral performance and neural response patterns among three groups of men matched for age and IQ: pedophiles with \(N=40\) and without \(N=37\) a history of sexual offences against children as well as healthy non-offending controls \(N=40\). As compared to offending pedophiles, non-offending pedophiles exhibited superior inhibitory control as reflected by significantly lower rate of commission errors (false responses to nogo-trials). Group-by-condition interaction analysis also revealed inhibition-related activation in the left posterior cingulate and the left superior frontal cortex that distinguished between offending and non-offending pedophiles. Our results suggest that both inhibition-related behavioral and neurofunctional alterations are associated with and therefore may be predictive of sexual offending against children within the group of pedophiles. Both areas showing distinct activation pattern play a critical role in linking neural networks that relate to effective cognitive functioning. Data therefore suggest, that heightened inhibition-related recruitment of these areas is related to better inhibitory control in pedophiles who successfully avoid committing sexual abuse. From a clinical point of view, the present data thus indicate that intervention strategies aimed at fostering basic inhibitory control abilities might be useful for preventing CSO in both pedophiles who already engaged in CSO as well as those at risk.
Learning Goals and Objectives:

- Recent research provides evidence of aberrant brain functioning and altered brain structure in child sexual abusers, which may contribute to sexual offending behavior against children. The current presentation aimed at:
  - Providing a brief overview of the recent literature on response inhibition in general and with specific regard to pedophilia and CSO.
  - It is planned to introduce our recent research on response inhibition and the associated group design, which enables us to distinguish between offending and non-offending pedophiles.
  - Moreover, it is intended to convey the advantages of analyzing response inhibition in combination with fMRI in the abovementioned groups and
  - To discuss its implications for future clinical interventions aiming at the prevention of child sexual offences.
  - Another aim of the presentation is to discuss the findings as well as the limitations of the present study within the context of recent results deriving from experiments focusing on the functional and structural brain correlates of deviant sexual behavior.

Moral Decision-Making in Pedophilia: Behavioral and Neural Correlates

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Background.

Pedophilia is a preference disorder that is often associated with child sexual offending (CSO) and nearly always with thinking about child sexual offenses. As sexual activity of adults involving young children is nearly universally regarded as immoral it is of high interest to know if imaging child sexual offenses is altered in pedophilia in the brain as compared to non-pedophilic controls and with respect to offense status within subjects with pedophilia.

Determining deficiencies in moral decision-making could be helpful to deepen our understanding of this deviant sexual preference and moreover help developing intervention strategies aimed at decrease the risk of offending in convicted pedophiles or those at risk.
Methods. A total of 35 pedophilic men (n = 18 with and n =17 without a history of CSO) and 24 healthy controls were assessed by using functional magnetic resonance imaging (fMRI) in combination with a newly developed moral decision paradigm. The paradigm consists of 36 scenarios describing different types of offenses that had to be judged with respect to their moral reprehensibility.

Results. Data revealed that, compared to controls, pedophilic subjects in general showed a reversed activation pattern in the left temporo-parietal-junction (TPJ) and the left insular cortex during the evaluation of sexual offensive scenarios concerning adults versus those concerning children. Moreover, the brain activation patterns were associated with behavioral results only in the control, but not in the pedophilic groups.

Discussion. Activation of key brain areas of the social/moral brain and (socio-)moral disgust showed an interaction of sexual preference of the group and type of victim, suggesting that pedophiles judge and process sexual aggression differently. The lack of associations between brain activation and behavioral responses in pedophiles further either suggests a biased response pattern or different implicit valuation processes. Results will be moreover discussed in the light of recent findings in moral neuroscience and neurobiology of pedophilia.

Learning Goals and Objectives:
- Understanding the design of fMRI paradigms used in moral decision-making research
- Getting to know important results from recent fMRI research as well as milestones on moral judgment
- Understand the importance to differentiate between pedophilic offenders and non-offenders in the study-field of pedophilia
- Getting to know the benefits and opportunities of studying morality in pedophilic men and child sexual abusers as well as its possible clinical implications
- Understand the different brain activation pattern as well as behavioral results regarding moral decision-making in pedophilic men and healthy controls
Assessing Sexual Interests with a Functional Neurological Marker for Less Than $100 per Evaluation? On The Promises of Using Quantitative Electroencephalography (qEEG)

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Objective assessment of sexual preferences is of paramount importance in forensic psychiatry. Given that sexual arousal might induce specific brain activation patterns, neuroimaging could serve to confirm sexual interests of a given individual. To date, however, most studies are conducted with functional resonance magnetic imaging, which is a costly and lowly available technique, especially in clinical and forensic settings. The main goal of this study was to develop and to validate an alternative approach to detect the nature of sexual interests based on the spectral decomposition of brain waves (qEEG). Sexual arousal, assessed with plethysmography, and qEEG of men recruited among the general population or among a forensic setting (child sexual offenders) were measured. Results showed that a specific cortical frequency (8-13 Hz), originating from a specific cortical region (sensorimotor cortex) is highly sensitive to sexual arousal in both groups of participants when corresponding stimuli are used. qEEG seems to be a valid, low cost, and accessible neuroimaging approach to evaluate sexual (including pedophilic) sexual interest.

Learning Goals and Objectives:
- Discovering a new, low-cost and objective measure of sexual preferences.
- Understanding the bases of quantitative electroencephalography.
- Realizing the link between brain activity and sexual arousal.