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Neural Correlates of Pain and Suffering Observation in Sexual Sadists

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Sexual sadism is a psychiatric disorder which refers to the sexual pleasure an individual derives from inflicting pain, suffering and/or humiliation upon another person. The pain and suffering of the victim, which may be both physical and psychological, is essential to the sadist for sexual arousal and pleasure.

It must be pointed out that I use the word 'victim' here and throughout,

but the partners of sadists are not always *victims*. Indeed, sexual sadists sometimes engage in sexual activities with consensual partners. Nonetheless, I adopt the word 'victim' here since this is the term that is used in the studies discussed to describe the individual upon whom the sexual sadist is practicing.

The ICD-10 Classification of Mental and Behavioural Disorders (World Health Organization, 1992) characterises sadism as the "preference for sexual activity that involves bondage or infliction of pain or humiliation".

Diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) requires the following to be met for a diagnosis of sexual sadism:

1. Over a period of at least 6 months, recurrent, intense sexually arousing fantasies, sexual urges, or behaviors involving acts (real, not simulated) in which the psychological or physical suffering (including humiliation) of the victim is sexually exciting to the person.

2 The person has acted on these sexual urges with a non-consenting person, or the sexual urges or fantasies caused marked distress or interpersonal difficulty.

The criteria indicate that the impairment must be perceived by the individual for a diagnosis.

Currently, the prevalence of sexual sadism remains elusive. As a result, studies attempting to determine the prevalence focus on criminal populations. Based on investigation of sexual offenders, estimates vary widely from 5% to 11% to 45% to 50% . However, it is important to note that these estimates may not reflect the percentage among the general population.

Even less is known about the neurocognitive circuitry (the neuroscience) underlying sexual sadism.

Some argue that the sexual sadism is a brain disease (Money, 1990). It has also been proposed that sadism is used as a form of self-medication for an abnormal brain (Chuang, 2011). But these are, as yet, unsupported views given that the majority of paraphiliacs exhibit no brain damage or other neurological disorder.

Paraphilia is a broad term used to characterise the experience of intense sexual arousal to atypical objects, situations, or individuals. When diagnosed as a disorder, it is a psychosexual disorders characterised by sexual fantasies, feelings, or activities involving a nonhuman object, a nonconsenting partner such as a child, or pain or humiliation of oneself or one's partner. The DSM-IV-TR includes eight specific paraphilic disorders



(exhibitionism, fetishism, frotteurism, pedophilia, sexual masochism, sexual sadism, voyeurism, and transvestic fetishism, in addition to a residual category, paraphilia—not otherwise specified) (Malin & Saleh, 2007).

Though the majority of paraphiliacs do not exhibit any known brain damage or neurological disorder, an increase in peripheral sexual arousal has been observed in sexual sadists when they observe an individual in pain. *What are the neural mechanisms underlying this atypical response to another individual's pain and suffering?* There have been some relevant experiments.

A few interesting studies from the 1980's, using both computerised tomography (CT) and neuropsychological assessment, have shown statistically significant associations between sadism and right-sided temporal horn damage (dilation) (Graber et al., 1982; Langevin et al., 1988; Hucker et al., 1988). Another group of researchers showed that 55% of their studied sadists displayed neurological abnormalities, primarily in the temporal lobe (Gratzer & Bradford, 1995). These imaging studies highlight the existence of *structural* neurobiological differences in the brains of sadists compared to non-sadists.

Yet another imaging study recorded positron emission tomographic activity (PET) in one sadist and two non-sadists during the presentation of erotic and neutral auditory stimuli. Findings revealed right lateralised activity during both stimuli in non-sadists, whereas the sadist exhibited more bilateral activity – activity in both hemispheres (Garnett et al., 1988). This study provides evidence of a difference in the *patterns of activity* in the brains of sadists compared to non-sadists. Note however that there are obvious limitations with making any interpretations from this study given the *very* small sample.

Most recently (2012), Jean Decety, a psychology professor at the University of Chicago, believes that his functional magnetic resonance imaging (fMRI) research is starting to address the long-standing debate over whether sadists are indifferent to another individual's pain or derive pleasure from it.

In their study, Decety and colleagues recruited 15 violent sexual offenders including 8 sadists and 7 non-sadists (defined using the Severe Sexual Sadism Scale) who were matched for age, IQ, and education. They viewed 50 social scenes, 25 of which depicted a person in pain (for example, one person stabbing another person's hand with scissors) and 25 thematically matched no-pain pictures (e.g., one person stabbing a table with scissors, with another person's hand nearby). Participants were asked to complete pain severity ratings (range, 0 [none] to 4 [severe]) following each picture presentation.



Surprising findings emerged.

Compared to the non-sadists, the sadists were found to have *increased* amygdala activation when viewing the pain pictures compared to no-pain pictures. This region of the brain has a primary role in the processing of memory and emotional reactions. This may indicate that sadists are not indifferent to other's pain—indeed, that they are *more* sensitive to it. Consistent with this, sadists also rated pain pictures higher on pain severity as compared to non-sadists. So too, sadists but not non-sadists showed a positive association between pain severity ratings and activity in the anterior insula. These neurobiological findings highlight an unusually or abnormal heightened sensitivity to the pain of others in sadists.

Caution must be exerted when interpreting the findings by Decety and colleagues. As

they point out, their sample of sexual sadists were incarcerated offenders. Therefore it is unclear how representative these findings are to other sexual sadists in the general population – specifically ones engaged in acts of sadism which are consensual.

Future research is necessary to address some of the questions surrounding whether these findings are suggestive of inherent abnormalities (e.g., structural) within these brain regions in sexual sadists or instead reflect a different context-dependent engagement of brain regions compared to non-sadists. Whether sexual sadists are hard-wired differently or just use their brains differently during sexual situations remains an unanswered question.

Though there's still a lot to learn, the evidence suggests that counter to widespread belief, sexual sadists may actually be *more* sensitive to the suffering of others that arouses them!

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