

The Mind of a Psychopath

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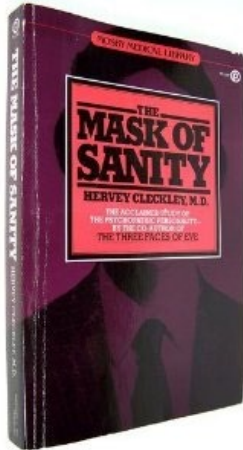
Some Background

- 20-25% of convicts fit criteria for Psychopathy
- 80% of recidivism as opposed 50% of normal convicts
- Hare – 1% of all population (Canada)
- Net annual burden of US crime > \$1 Trillion





Hervey Cleckley



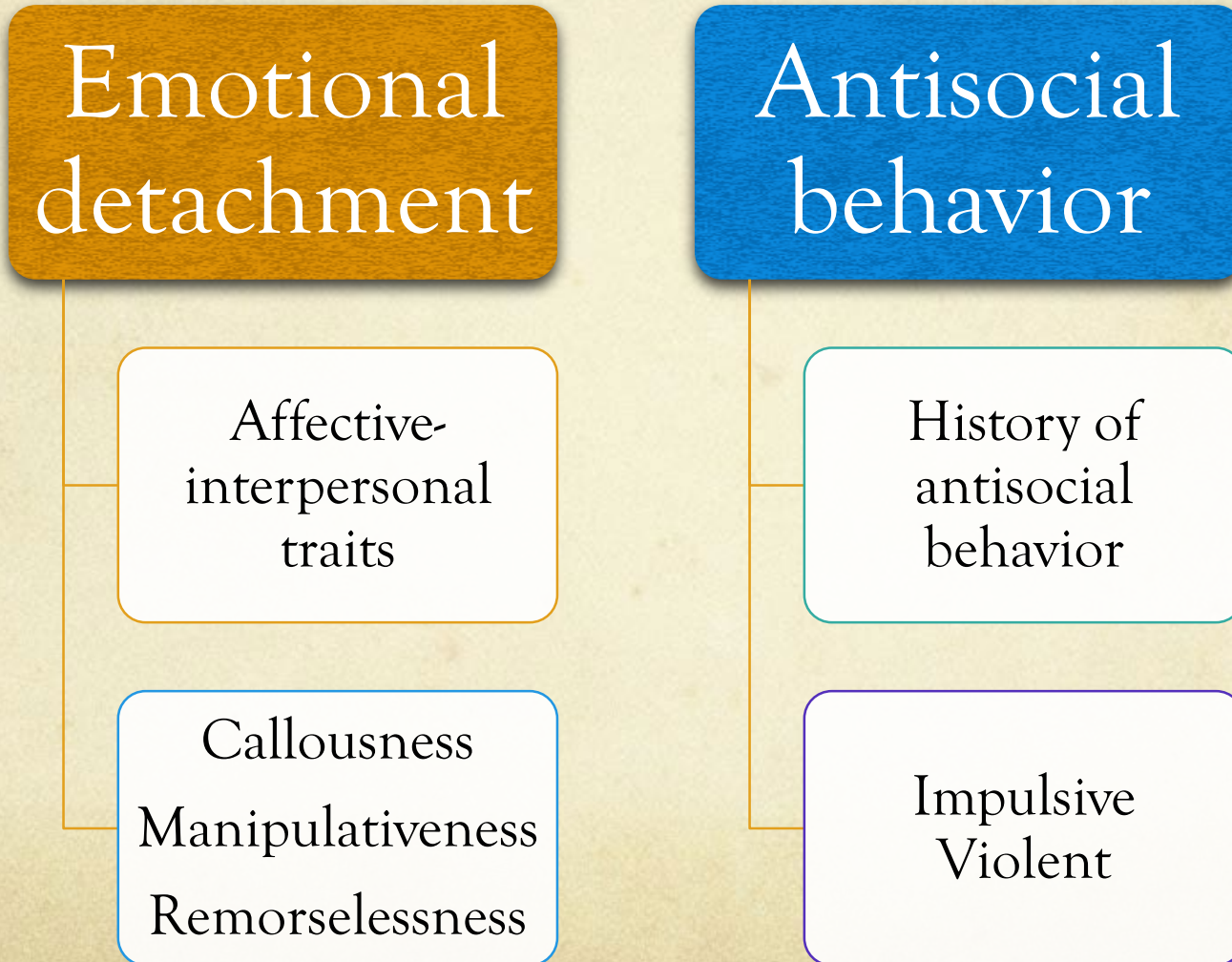
- The Mask of Sanity (1976)
- Characterization
 - Antisocial lifestyle
 - Selfish
 - Domineering
 - Manipulative
 - Irresponsible
 - Impulsive
 - Fearless
 - Shallow
 - Callous
 - Lacking empathy and remorse
 - Not just criminal or deviant behavior
 - Can be socially well adjusted and successful individuals

Psychopathy Checklist-Revised (PCL-R)

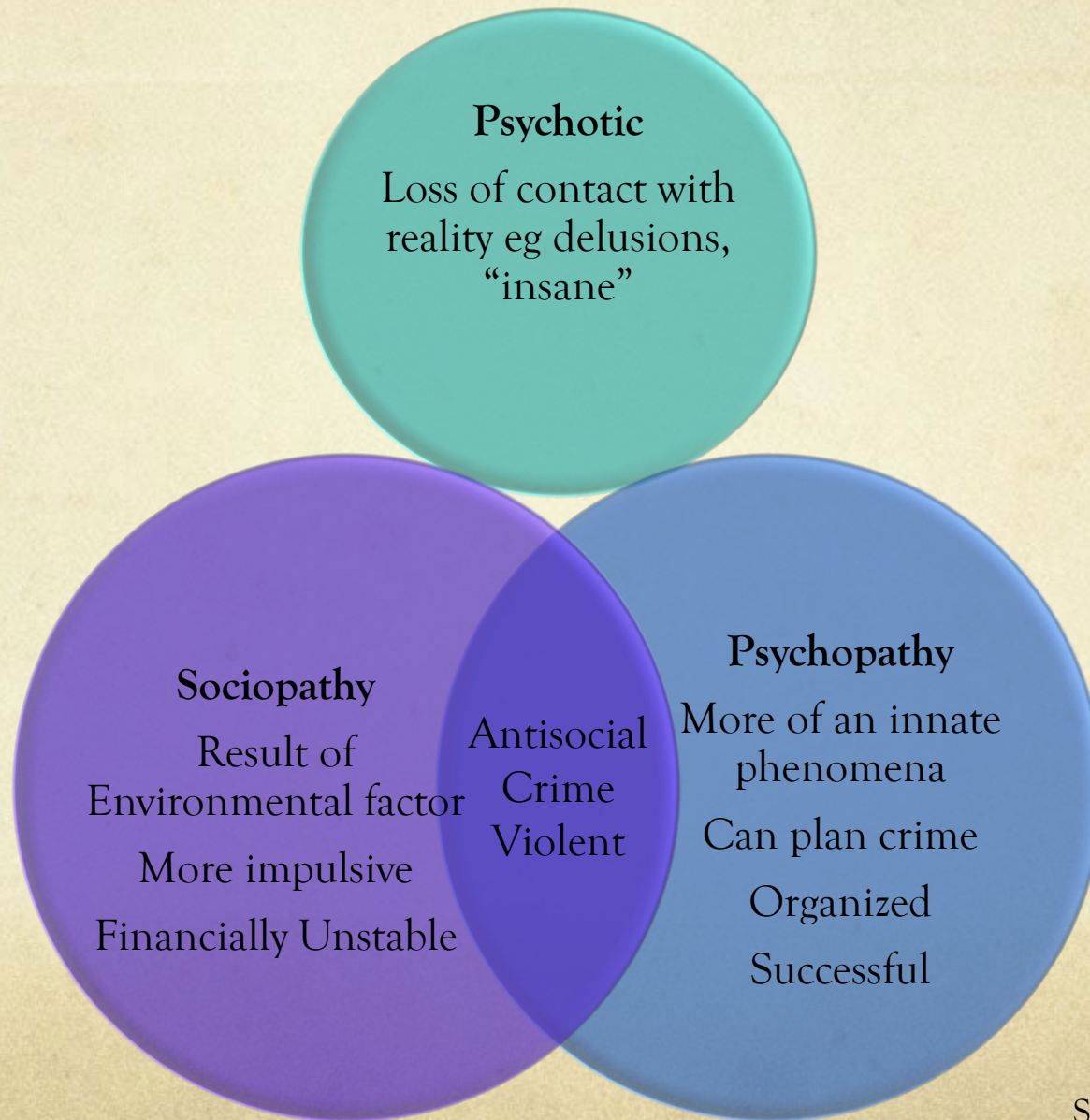


<http://www.hare.org/>

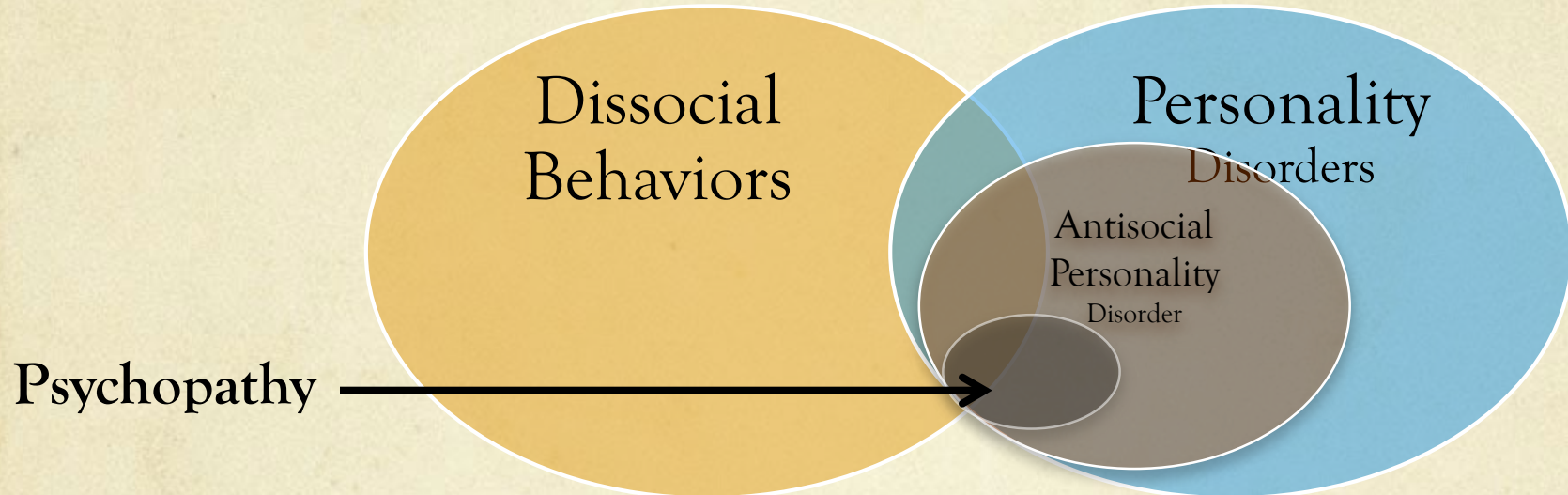
Factors influencing PCL-R score:



How do you know?



Distinction between PCL-R vs. DSM-IV – Antisocial Personality Disorder



Psychopathy

- a. Failure to conform to social norms (arrests)
- b. Irritability and aggressiveness (fights)
- c. Irresponsibility in work and financial matters
- d. Impulsivity (in actions) or failures to plan ahead
- e. Deceitfulness (cons, deceives)
- f. Reckless disregard for safety of self and others
- g. Lack of remorse, guilt, and indifference (absence of feelings)

Need 3 of the
following
characteristics

Structural Brain Abnormalities in Psychopaths—a Review

Sabrina Weber, M.Sc.,* Ute Habel, Ph.D.,[†]
Katrin Amunts, M.D.^{†,‡}
and Frank Schneider, M.D., Ph.D.[†]

Unlike the concept of psychopathy as operationalized by Hare's PCL-R, the DSM-IV criteria of an antisocial personality disorder are mostly restricted to the description of criminal and socially deviant behavior. Therefore, while a psychopath scores highly on both factors of the PCL-R, someone with an antisocial personality disorder will score highly on Factor 2 (antisocial behavior). The diagnosis of an antisocial personality disorder can hence be applied to the majority of prison inmates. Nearly 75% of prison inmates fit the DSM-IV criteria describing an antisocial personality disorder, while the prevalence of psychopathy is much lower, namely about one-quarter of the 75% prison inmates with APD (Hare, 1998). It is

Acquired sociopathy - pseudopsychopathy?

Recall:

Neural Basis of Decision Making

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Frontal lobe injuries, violence, and aggression:

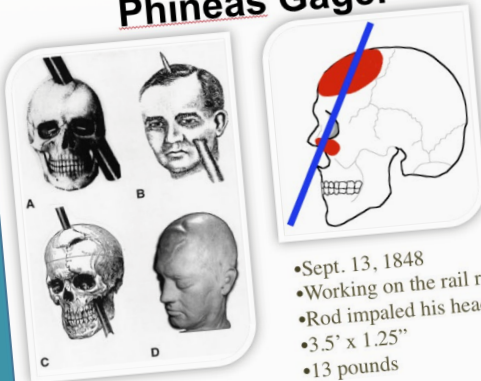
A report of the Vietnam Head Injury Study

J. Grafman, PhD; K. Schwab, PhD; D. Warden, MD; A. Pridgen, BS; H.R. Brown, HMCM, USN (Ret); and A.M. Salazar, MD

Article abstract—Knowledge stored in the human prefrontal cortex may exert control over more primitive behavioral reactions to environmental provocation. Therefore, following frontal lobe lesions, patients are more likely to use physical intimidation or verbal threats in potential or actual confrontational situations. To test this hypothesis, we examined the relationship between frontal lobe lesions and the presence of aggressive and violent behavior. Fifty-seven normal controls and 279 veterans, matched for age, education, and time in Vietnam, who had suffered penetrating head injuries during their service in Vietnam, were studied. Family observations and self-reports were collected using scales and questionnaires that assessed a range of aggressive and violent attitudes and behavior. Two Aggression/Violence Scale scores, based on observer ratings, were constructed. The results indicated that patients with frontal ventromedial lesions consistently demonstrated Aggression/Violence Scale scores significantly higher than controls and patients with lesions in other brain areas. Higher Aggression/Violence Scale scores were generally associated with verbal confrontations rather than physical assaults, which were less frequently reported. The presence of aggressive and violent behaviors was not associated with the total size of the lesion nor whether the patient had seizures, but was associated with a disruption of family activities. These findings support the hypothesis that ventromedial frontal lobe lesions increase the risk of aggressive and violent behavior.

NEUROLOGY 1996;46:1231-1238

Phineas Gage:



- Sept. 13, 1848
- Working on the rail road
- Rod impaled his head.
- 3.5' x 1.25"
- 13 pounds

Factors influencing PCL-R score:

Emotional detachment

Antisocial behavior

Affective-interpersonal traits

History of antisocial behavior

Callousness
Manipulativeness
Remorselessness

Impulsive Violent

Impulsive-
reactive

Antisocial
behavior

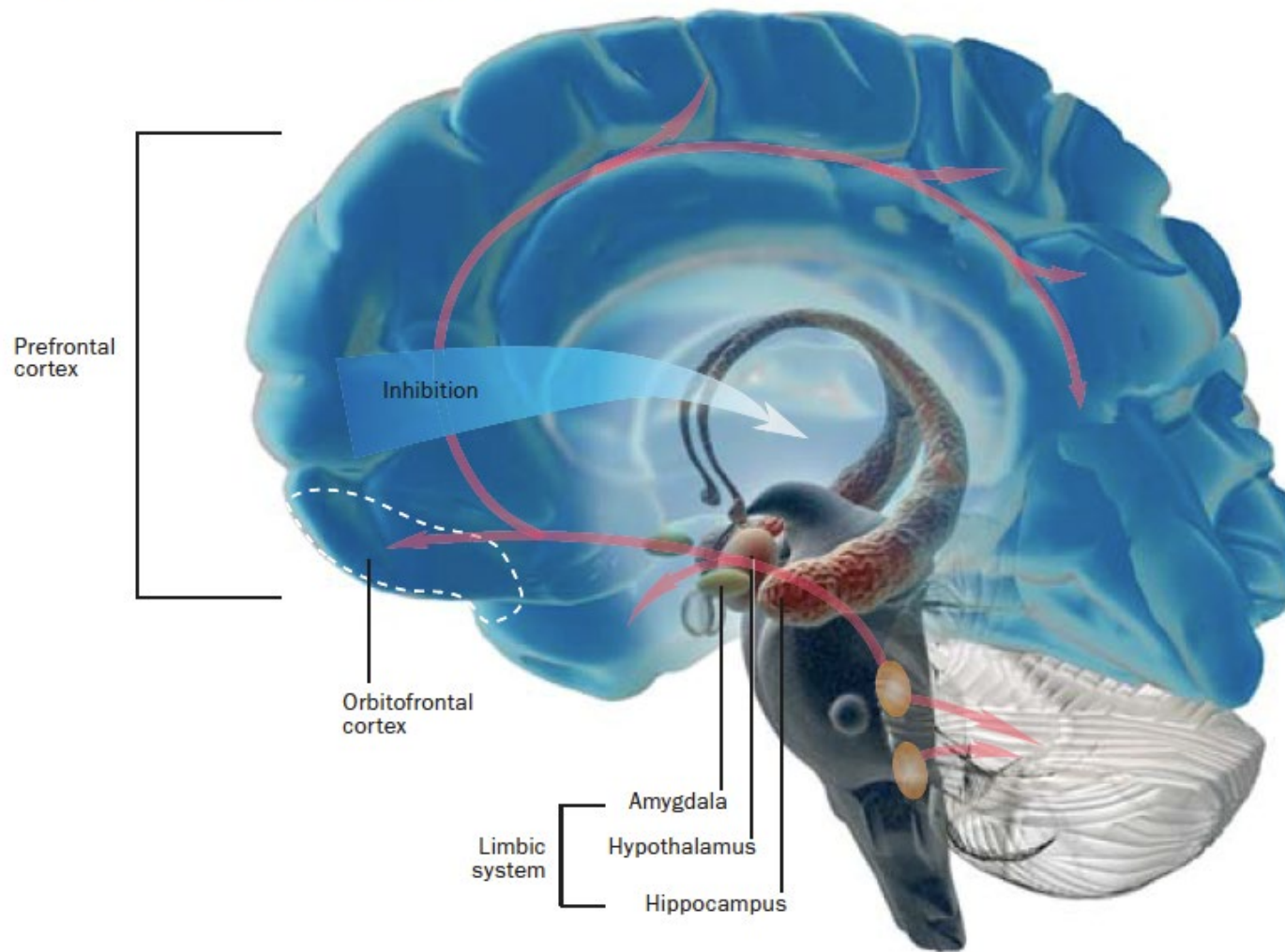
Allelic variations
may be
responsible for
neurocognitive fcn

Predatory

Psychopath

Predisposition to violent
behavior

Anatomy of Aggression



Anomalies in the prefrontal cortex may handicap some individuals, making it difficult for them to show restraint. Some scientists hypothesize that the orbitofrontal cortex, an area involved in decision making, normally inhibits regions in the limbic system—specifically the hypothalamus and the amygdala, where fear and aggression arise. If a defect blocks this communication, a person might not be

able to moderate his or her emotional reactions. Damage to the hippocampus may also impair the brain's processing of emotional information. In some instances, a malfunction of the amygdala may underlie violent behavior. This theory could explain the lack of fear, empathy and regret that is characteristic of criminals who plan their acts and commit them in cold blood.

—D.S., M.L. and G.R.

Is the X-linked MAO-A gene associated with predisposition to violence?

Monoaminoxidase A – enzyme in the catabolism of serotonin (and other monoamines)

Low expression (MAOA-L) associated with impulsive aggressive behavior.

Structural brain abnormalities – especially in the anterior cingulate cortex

and reduction in amygdala, insula and hypothalamus.

Nature or Nurture?

MAO-L

Low activity

(higher intracellular
concentration of 5-HT)

“Genetic vulnerability
to violence by MAOA-L
only in the presence of
environmental trigger of
maltreatment.”

Neural mechanisms of genetic risk for impulsivity and violence in humans

Andreas Meyer-Lindenberg^{*†‡§}, Joshua W. Buckholtz^{†‡}, Bhaskar Kolachana[‡], Ahmad R. Hariri^{†‡¶}, Lukas Pezawas^{†‡||}, Giuseppe Blasi^{†‡**}, Ashley Wabnitz^{†‡}, Robyn Honea^{†‡}, Beth Verchinski^{†‡}, Joseph H. Callicott^{†‡}, Michael Egan^{†‡†}, Venkata Mattay^{†‡}, and Daniel R. Weinberger[‡]

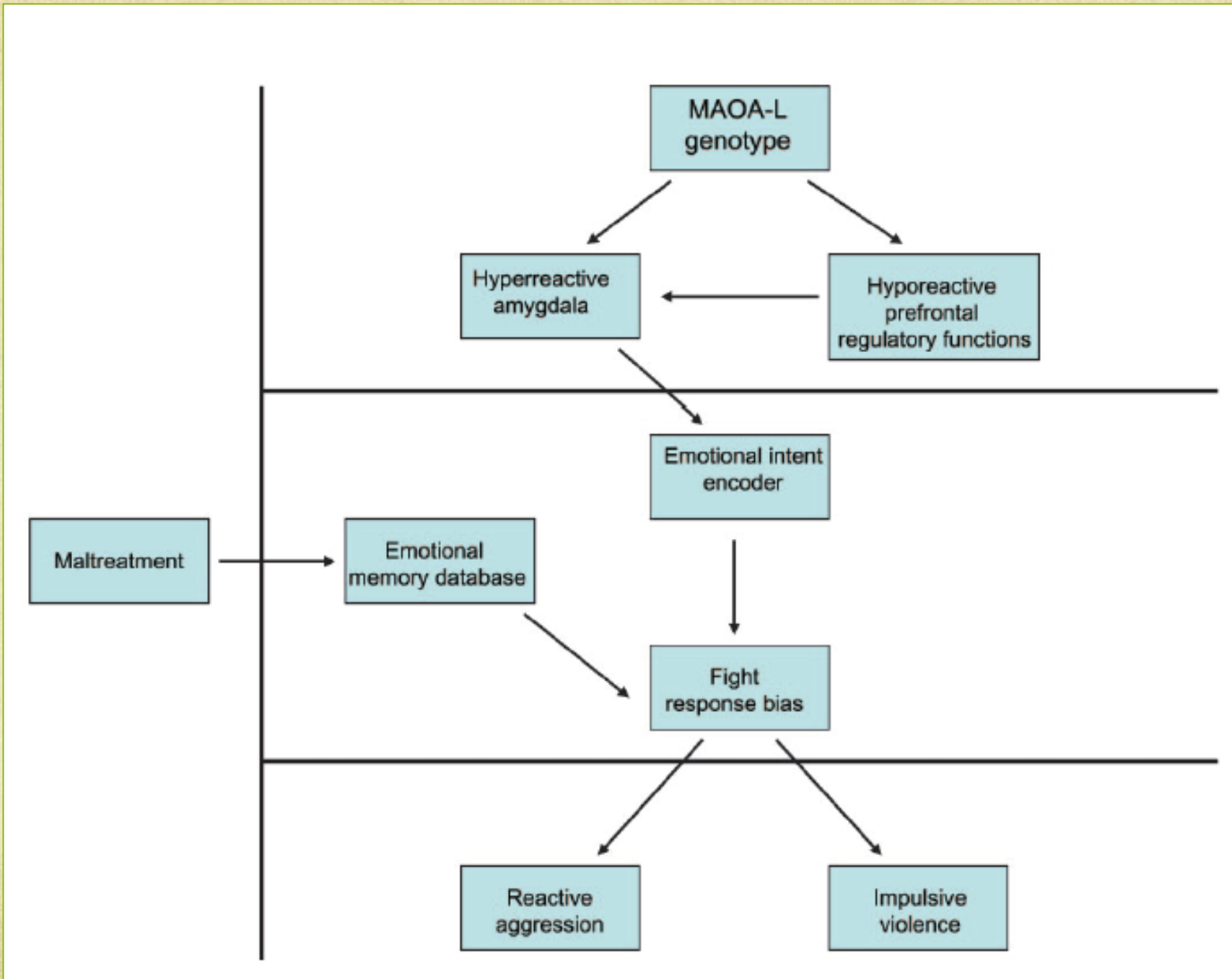
^{*}Unit for Systems Neuroscience in Psychiatry, [†]Neuroimaging Core Facility, and [‡]Clinical Brain Disorders Branch, Genes, Cognition, and Psychosis Program, National Institute of Mental Health, National Institutes of Health, Department of Health and Human Services, 9000 Rockville Pike, Bethesda, MD 20892-1365

Edited by Marcus E. Raichle, Washington University School of Medicine, St. Louis, MO, and approved February 8, 2006 (received for review December 30, 2005)

Neurobiological factors contributing to violence in humans remain poorly understood. One approach to this question is examining allelic variation in the X-linked monoamine oxidase A (*MAOA*) gene, previously associated with impulsive aggression in animals and humans. Here, we have studied the impact of a common functional polymorphism in *MAOA* on brain structure and function assessed with MRI in a large sample of healthy human volunteers. We show that the low expression variant, associated with increased risk of violent behavior, predicted pronounced limbic volume reductions and hyperresponsive amygdala during emotional arousal, with diminished reactivity of regulatory prefrontal regions, compared with the high expression allele. In men, the low expression allele is also associated with changes in orbitofrontal volume, amygdala and hippocampus hyperreactivity during aversive recall, and impaired cingulate activation during cognitive inhibition. Our data identify differences in limbic circuitry for emotion regulation and cognitive control that may be involved in the association of *MAOA* with impulsive aggression, suggest neural systems-level effects of X-inactivation in human brain, and point toward potential targets for a biological approach toward violence.

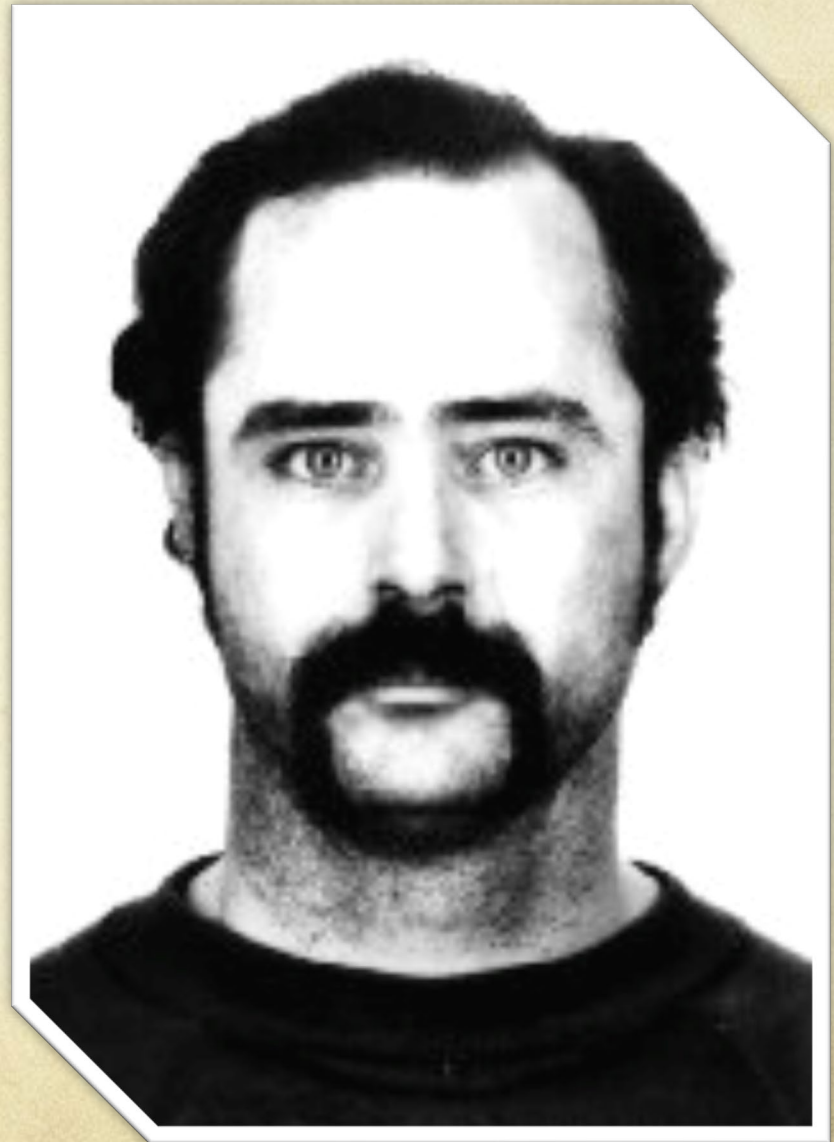
“For males the MAOA-L genotype is associated with amygdala hyper-responsivity during emotional arousal, coupled with diminished reactivity of regulatory prefrontal regions, compared with the high-activity allele (MAOA-H)”

Viding and Frith (2006)



Robert Alton Harris

- Looking for getaway for heist at San Diego Trust; Murdered John Mayeski, Michael Baker
- Was 25 years old. Harris taunted the victims before they died, laughed at them after he pulled the trigger, then calmly ate the hamburgers they had bought for lunch.
- Sociopath or Psychopath?



The Trial and the Controversy

- "As great as is my compassion for Robert Harris the child, I cannot excuse or forgive the choice made by Robert Harris the man." – Pete Wilson California Governor
- "You can be a king or a street sweeper, but everybody dances with the grim reaper." – Last Words, reference to Bill and Ted's Bogus Journey

Which is the Psychopath?



Ted Bundy...



- American serial killer, rapist, kidnapper and necrophiliac
- More than a decade of denials
- Confessed shortly before his execution to 30 homicides
- Regarded as handsome and charismatic (especially by his victims)
- Lived with grandparents, no abuse, harassment etc.

Empirical basis and forensic application of affective and predatory violence

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Classification of violent behavior

affective

Preceded by high autonomic arousal

Characterized by emotions of anger and/or fear

Response to a perceived imminent threat

predatory

Not preceded by autonomic arousal

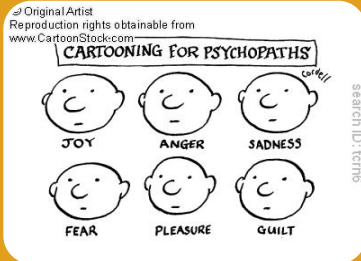
Absence of emotion or threat

Cognitively planned, premeditated, proactive, cold blooded

Table 1. Forensic criteria for determining affective or predatory violence (Meloy [2,57,58])

Affective violence	Predatory violence
1. Intense autonomic arousal	Minimal or absent autonomic arousal
2. Subjective experience of emotion	No conscious emotion
3. Reactive and immediate violence	Planned or purposeful violence
4. Internal or external perceived threat	No imminent perceived threat
5. Goal is threat reduction	Variable goals
6. Possible displacement of target	No displacement of target
7. Time-limited behavioural sequence	No time limited sequence
8. Preceded by public posturing	Preceded by private ritual
9. Primarily emotional/defensive	Primarily cognitive/attack
10. Heightened and diffuse awareness	Heightened and focused awareness

Psychopathic Personality Inventory...



Fearless Dominance

- Fearlessness
- Emotional and interpersonal deficits



Impulsive antisociality

- Rebellious nonconformity
- Crime
- Violence



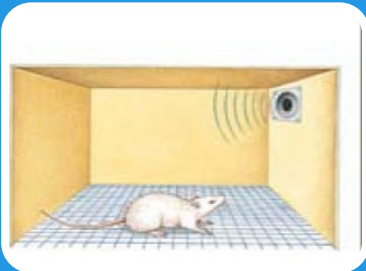
Cold-heartedness

- Mainly dependent on scores of other two
- Lack of moral facts

Emotional-Social Deficits



Reduced response to threatening or fear inducing stimuli, as measured by skin conductance



Moreover, individuals with psychopathy show difficulties in emotional learning.



Moral Transgressions v Conventional Transgressions Eg. Hair Pulling

Recall:

The ventromedial prefrontal cortex (VMPC).

The VMPC projects to basal forebrain and brainstem regions that execute bodily components of *emotional responses*, and neurons within the VMPC **encode the emotional value of sensory stimuli.**

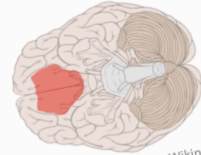
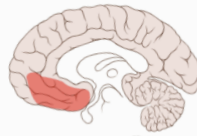


Image from Wikipedia



All six VMPC patients had impaired autonomic activity in response to emotionally charged pictures, as well as severely diminished empathy, embarrassment and guilt.

They were shown pictures of social disasters, etc. and their emotional response was measured using galvanic skin conductance measurement tools.



“Psychopathy is—among other things—related to impairments in the **medial region of the orbitofrontal cortex**, which is **extensively interconnected with the amygdala** and involved in instrumental learning and response reversal.”

Weber et al (2008) Behav. Sci. Law 26: 7–28

Theoretical models of psychopathy:

Somatic marker

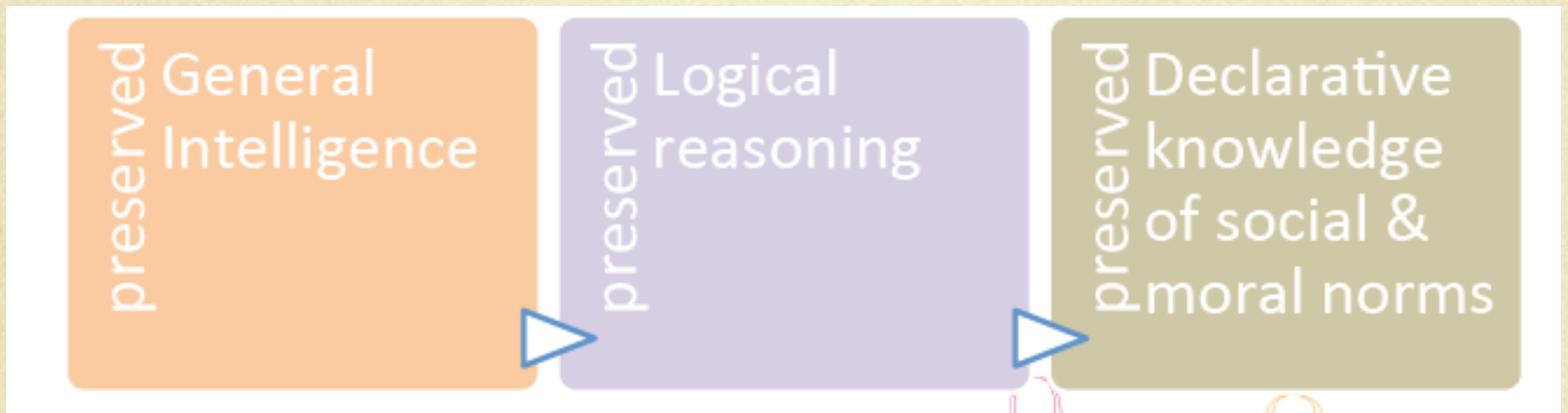
- Damasio (1994)
- VMPF damage
- Impaired decision making
- Insensitive to reward and punishment
- Poor access to social rules and potential outcomes.
- Iowa gambling task

Violence inhibition mechanism

- Blair (1995)
- Stresses the role of empathy for moral socialization.
- Amygdala dysfunction – cannot control aggression.
- Submission of aggression response with distress cues.
- Dysfunction of autonomic arousal could result in lack of empathy.

Recall, adult VMPPF damage...

For adult onset, recall last lecture...



...is it the same for early VMPPF damage?

... what happens if there is early damage to PFC?

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articles

Impairment of social and moral behavior related to early damage in human prefrontal cortex

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The long-term consequences of early prefrontal cortex lesions occurring before 16 months were investigated in two adults. As is the case when such damage occurs in adulthood, the two early-onset patients had severely impaired social behavior despite normal basic cognitive abilities, and showed insensitivity to future consequences of decisions, defective autonomic responses to punishment contingencies and failure to respond to behavioral interventions. Unlike adult-onset patients, however, the two patients had defective social and moral reasoning, suggesting that the acquisition of complex social conventions and moral rules had been impaired. Thus early-onset prefrontal damage resulted in a syndrome resembling psychopathy.



Subject A - Case Report

The first patient (subject A) was 20 years old at the time of these studies and was ambidextrous. **She had been run over by a vehicle at age 15 months.** At the time of the accident, she appeared to recover fully within days. **No behavioral abnormalities were observed until the age of three years,** when she was first noted to be **largely unresponsive to verbal or physical punishment.** Her behavior became **progressively disruptive,** so much so that, by age 14, she required placement in the first of several treatment facilities. Her teachers considered her to be **intelligent and academically capable,** but she routinely failed to complete assigned tasks.

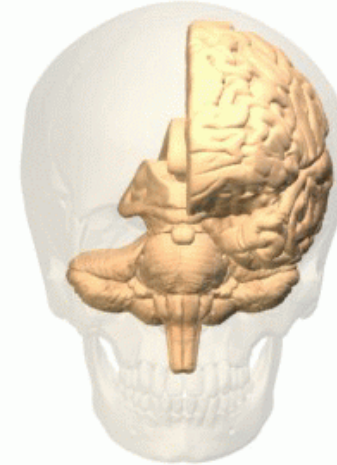
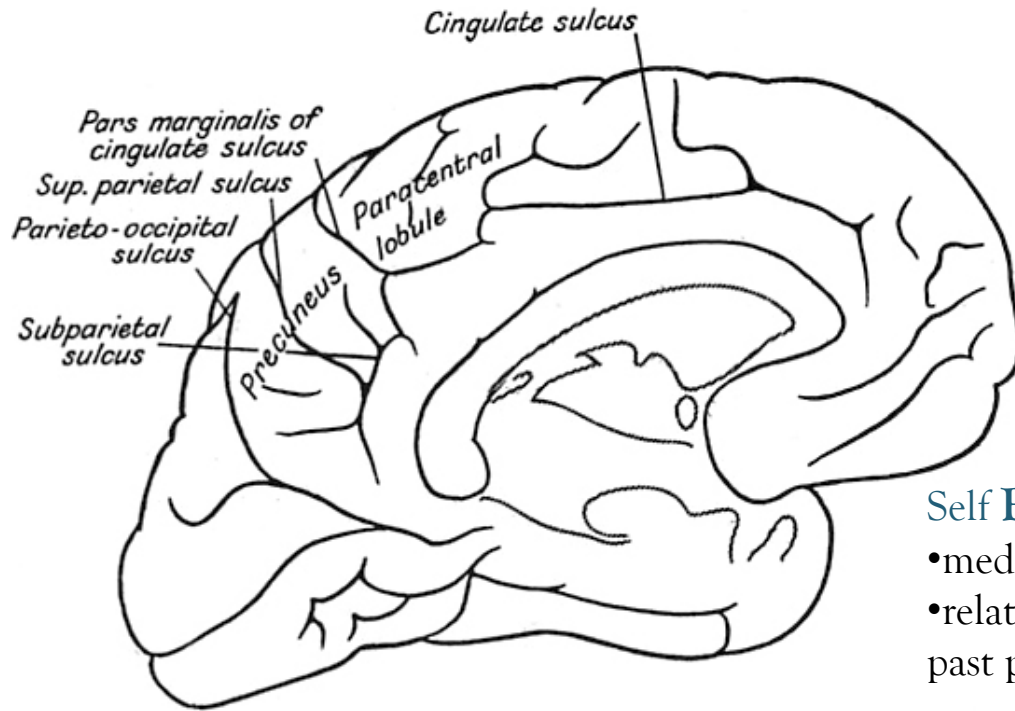
Her adolescence was marked by disruptive behavior in school and at home (for example, **failure to comply with rules, frequent loud confrontations with peers and adults**). **She stole from her family and from other children and shoplifted frequently, leading to multiple arrests**. She was verbally and physically abusive to others. She **lied chronically**. Her lack of friends was conspicuous. She ran away from home and from treatment facilities. She exhibited **early and risky sexual behavior** leading to a pregnancy at age 18. Contingency management in residential treatment facilities and the use of **psychotropic medication were of no help**. After repeatedly putting herself at physical and financial risk, she became entirely dependent on her parents and on social agencies for financial support and oversight of her personal affairs. She did not formulate any plans for her future and she sought no employment. Whenever employment was arranged, **she was unable to hold the job due to lack of dependability and gross infractions of rules**.

Affect was labile and often poorly matched to the situation, but superficial social behavior was unremarkable.

She *never expressed guilt or remorse for her misbehavior*. There was little or **no evidence that she experienced empathy**, and her maternal behavior was marked by dangerous insensitivity to the infant's needs.

She **blamed her misdeeds and social difficulties on other people, and she denied any difficulties with cognition or behavior.**

A little bit more about the precuneus



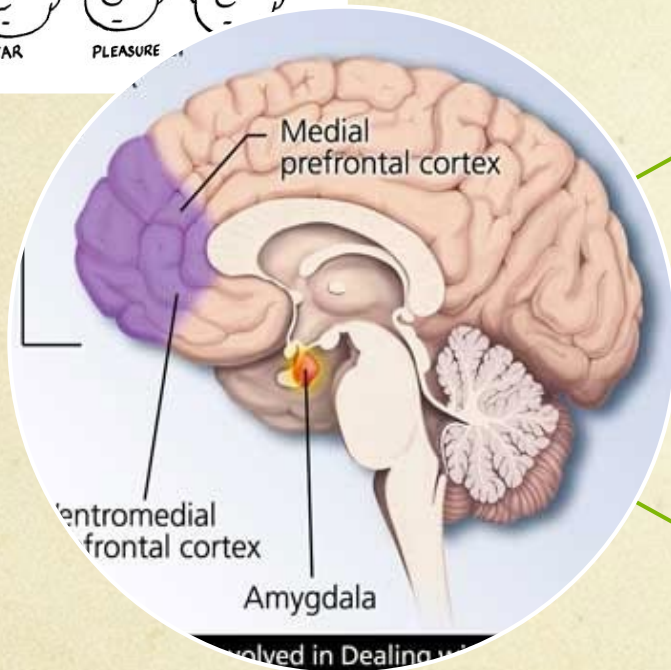
Self Representation vs. Self Awareness:

- medial prefrontal area cxn precuneus
- relates personal identity with past personal experiences

- Causal links between one's own intentions and actions (intentional causality)

- Theory of Mind – Empathy & Forgivability

What does this mean?



Amygdala

- Underlie aspects of emotion regulation, aggression, and stimulus reinforcement associations.

Precuneus

- Underlies aspects of reflective processing and empathy, especially when it comes to decision making

The two theories may not be exclusive:

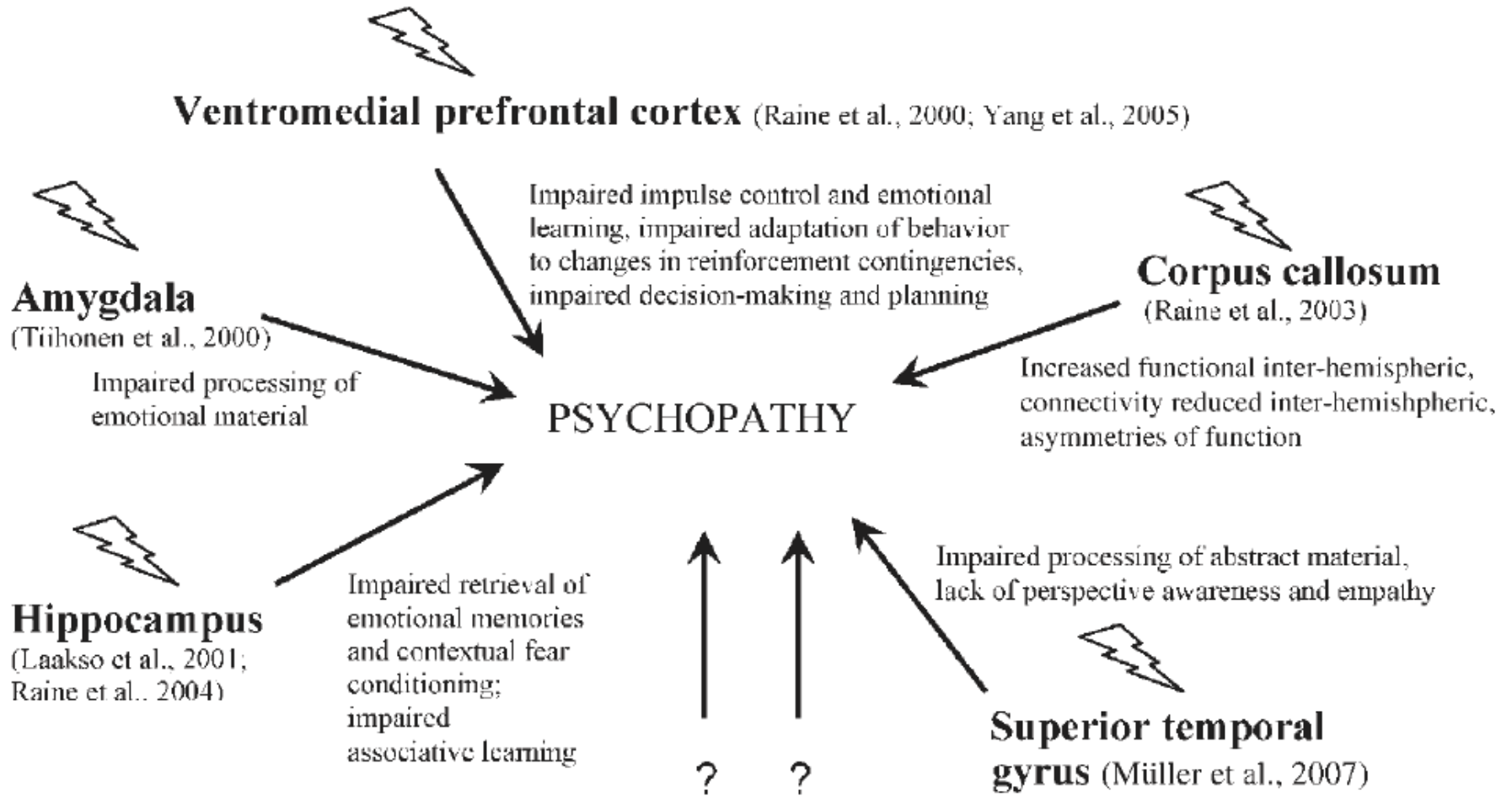


Figure 6. Affected brain regions in psychopathy (findings of the reviewed structural neuroimaging studies).

The Amygdala

Kiehl and colleagues found reduced amygdala activity in psychopathic criminals in response to emotionally charged words

Children with callous unemotional traits have less amygdala activity than other children when viewing photos of fearful expressions

“Once they start paying attention to some goal they want, they ignore cues that would otherwise activate the amygdala”



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Psychiatry Research: Neuroimaging 130 (2004) 297–312

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Temporal lobe abnormalities in semantic processing by criminal psychopaths as revealed by functional magnetic resonance imaging

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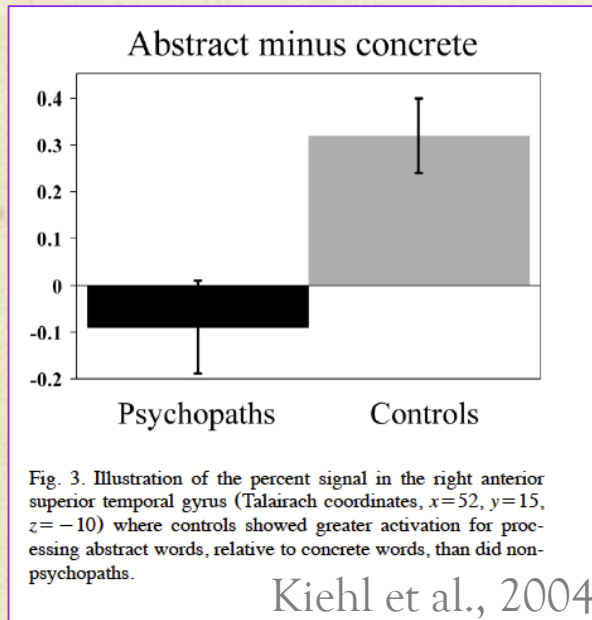
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Psychopaths are impaired cognitively



Right anterior superior temporal gyrus – fMRI and structural abnormalities in psychopaths

Abstract word processing and emotion-related hypo-function

The abnormalities could relate to problems with complex social emotions – love, empathy, guilt and remorse.

Social and Moral Reasoning

Level 3: Postconventional

Stage 6: Personal commitment to universal moral principles.

Stage 5: Recognition that moral perspective may conflict with law. Consider rights and welfare of all.

Achieved by a minority of adults.

One of 6 adult-onset patients at this level.

Level 2: Conventional

Stage 4: Recognition of obligations to society. The individual is viewed within the system.

Stage 3: Reliance on the Golden Rule. Be a good person in your own eyes and those of others.

Characteristic of most adults and adolescents.

Five of 6 adult-onset patients at this level.

Level 1: Preconventional

Stage 2: Concrete reasoning that, to serve one's own needs, you must recognize other's rights.

Stage 1: Egocentric perspective with decisions based on avoidance of punishment.

Characteristic of most children under age 9.

Both early-onset patients at this level.

Not really....

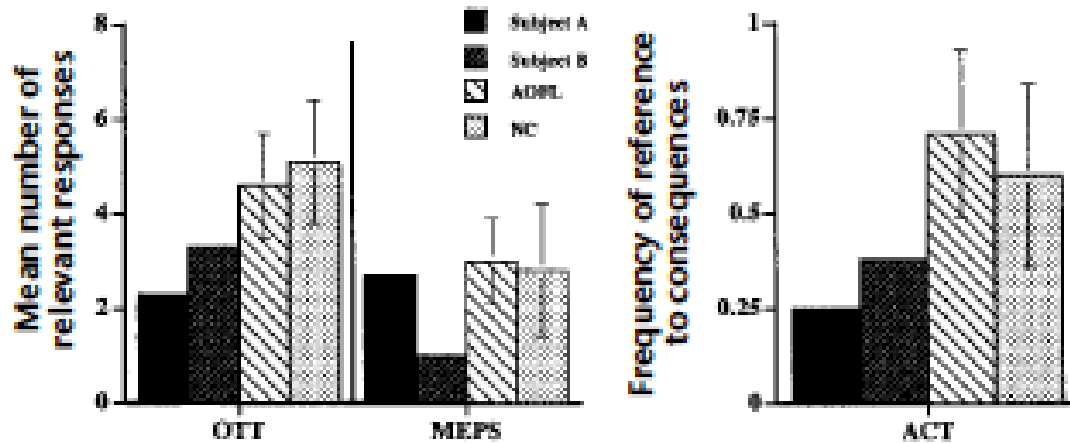
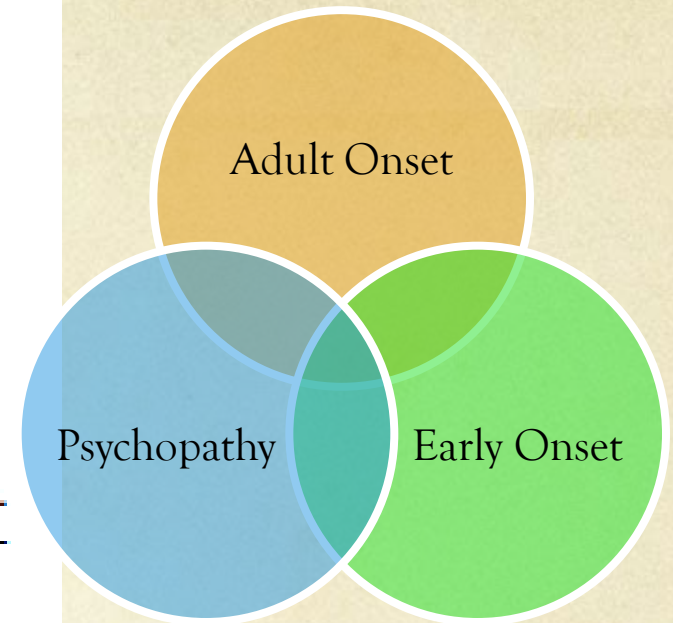


Fig. 1. Social and moral reasoning. (a) Kohlberg Moral Judgment Task. (b) Social fluency; OTT, optional thinking test; MEPS, means–ends problem solving; ACT, awareness of consequences.



- Performed similarly in decision-making tasks eg Iowa Card Gambling Task
- But “...their performance was in stark contrast to that of patients with adult onset who can access the facts...”

Immoral, Amoral, or just plain wrong?... Accountability?

- ... patients failed In both emotionally-related and factual modes of retrieval, it is possible that they never acquired socially relevant knowledge either in emotional or factual modes.... They may have never acquired such knowledge...



THE RESPONSIBILITY OF THE PSYCHOPATH REVISITED

NEIL LEVY

ABSTRACT: The question of the psychopath's responsibility for his or her wrongdoing has received considerable attention. Much of this attention has been directed toward whether psychopaths are a counterexample to motivational internalism (MI): Do they possess normal moral beliefs, which fail to motivate them? In this paper, I argue that this is a question that remains conceptually and empirically intractable, and that we ought to settle the psychopath's responsibility in some other way. I argue that recent empirical work on the moral judgments of psychopaths provides us with good reason to think that they are not fully responsible agents, because their actions cannot express the kinds of ill-will toward others that grounds attributions of distinctively moral responsibility. I defend this view against objections, especially those due to an influential account of moral responsibility that holds that moral knowledge is not necessary for responsibility.

KEYWORDS: responsibility, moral knowledge, mental

Psychopaths also present us with an all too practical challenge. They are (causally) responsible for a disproportionately large percentage of crimes: more than fifty percent of violent crimes, and a very large percentage of petty thefts, frauds, and other relatively minor crimes (Reznek 1997, pp. 136–40). Many psychopaths have long records of convictions for offences followed by short prison sentences and, often, stays at psychiatric institutions. Most do not go on to become murderers, but some do, in spectacular fashion. “Psychopath” is far from synonymous with “serial killer,” but most serial killers are probably psychopathic. Ought we to hold the psychopath morally responsible for these crimes? Or should we excuse them, as we (typically) excuse those suffering from psychoses and some impulse-control disorders?

Aggressive narcissism

- Continual devaluation (aggressive) of others in order to pump up own self-esteem
- Glibness, grandiose, pathological lying, manipulative, lack of empathy and sadistic.

Antisocial behavior

- Long-term offensive and sometimes criminal behavior
- Prone to boredom, parasitic lifestyle, poor impulse control, irresponsible, promiscuous sexual behavior.

Psychopaths have abnormal standards!

- You should check out a video on YouTube called "The Uniqueness of Humans" by Robert Sapolsky. It is a lecture he gave at Stanford University and covers this same subject and it pretty interesting. Be advised though, it is a 40 min video