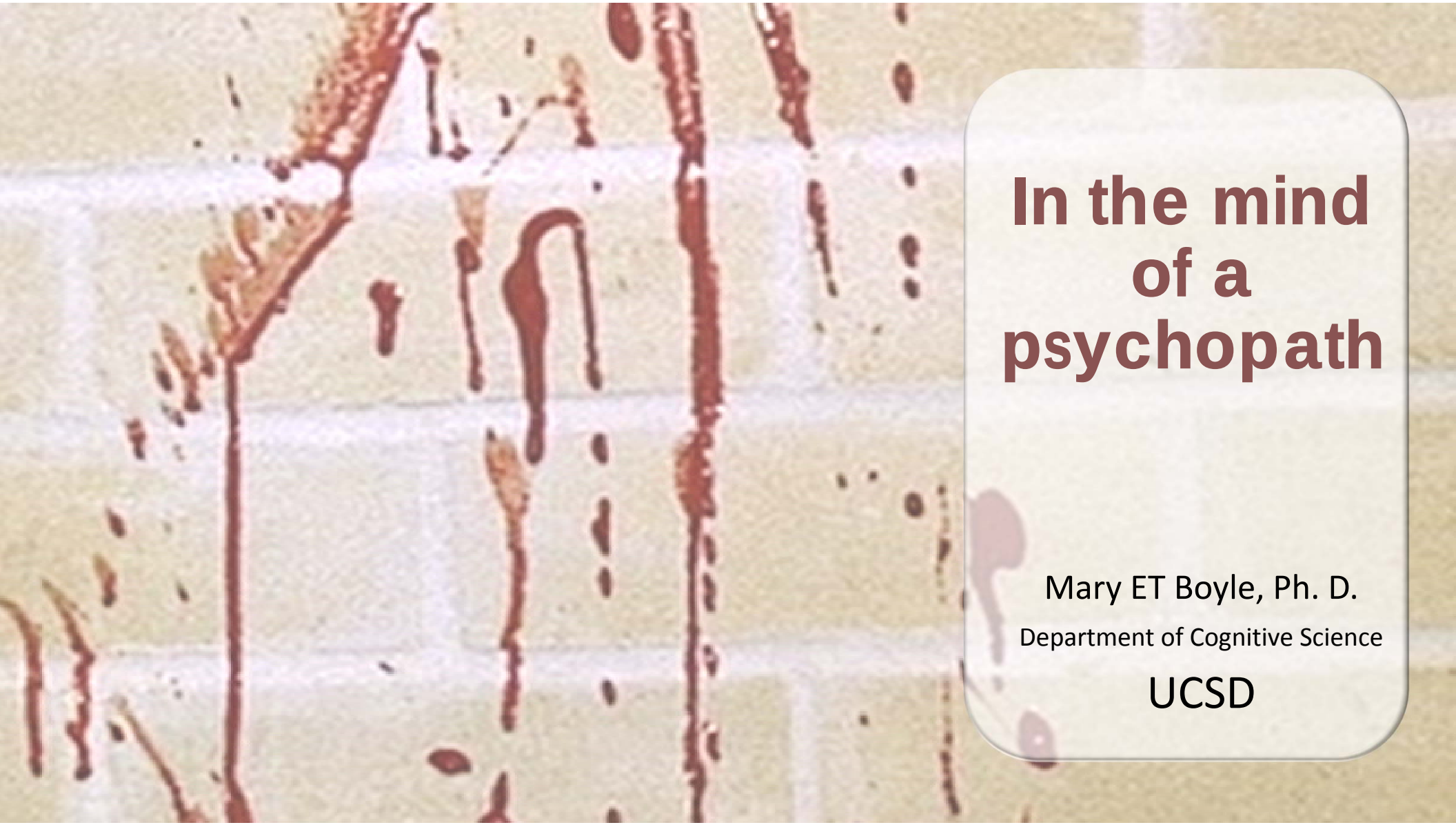

In the mind of a psychopath

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NEWSFOCUS

Investigating the Psychopathic Mind

With a mobile brain scanner and permission to work with inmates in New Mexico state prisons, Kent Kiehl hopes to understand what goes awry in the brains of psychopathic criminals

ALBUQUERQUE, NEW MEXICO—Kent Kiehl remembers his first conversation with a psychopath as if it were yesterday. Kiehl had just started a graduate program in psychology and he intended to study the criminal mind by interviewing prisoners. His first subject was a thief who'd made a fortune robbing banks in North America and lived the high life for years, resting luxury apartments across Europe and—if he did say so himself—enjoying a great deal of success with the fairer sex. "I have you ever had 15 women in one night?" he asked Kiehl.

The man was behind bars not because of a heist gone wrong but because one of his girlfriends was cheating on him. He tracked her down at a motel room and burst in with his gun drawn. He shot her lover, but the man managed to get away. The woman later testified against him in court. If he could do it all over again, he told Kiehl, he would have killed them both. Such stories fascinate Kiehl, now an associate professor of psychology and neuroscience at the University of New Mexico and director of Mobile Imaging Core and Clinical Cognitive Neuroscience at the Mind Research Network (MRN) in Albuquerque. "The other 300 or so psychopaths I've interviewed are just as interesting," he says.

At age 38, Kiehl is embarking on a project he hopes will unravel the neural basis of psychopathy, a suite of personality and behavioral traits that is far more common in violent criminals than in the general population and is a strong predictor of repeat offenses. Given the crime and other societal costs caused by psychopathic individuals, Kiehl says, this group has been woefully understudied. He intends to change that. With a custom-built mobile magnetic resonance imaging (MRI) scanner—roughly $2.3 million of equipment packed into a 15-meter-long trailer—and permission from the New Mexico governor to work in all 12 state prisons, Kiehl aims to scan 1000 inmates a year.

"We'll have to see if he gets that much done, but if anybody can do it, Kent can," says Joseph Newman, a psychologist at the University of Wisconsin, Madison. "He has big ideas, and he pursues them energetically."

Kiehl's team conducts hours of interviews with each subject to assess them for psychopathy, substance abuse, and other mental health problems. In addition to functional MRI (fMRI) experiments to investigate neural activity during various tasks, they're also collecting anatomical images of the brain and DNA samples that could eventually be used to search for genetic risk factors—all with the prisoners' full consent and cooperation and all to be used solely for research. Kiehl's research is funded by four R01 grants from the National Institutes of Health, which pay about $900,000 a year in direct costs; MRN paid for the scanner.

Depending on what he finds, Kiehl's work could raise a host of legal and ethical questions. Could brain scans or blood tests one day improve on the personality profiles and other low-tech methods now used to assess the degree of risk a prisoner poses to society? If so, how should they be used? Could a better understanding of the psychopathic brain alter the way we think about the culpability of certain criminals? Could it point the way to interventions that prevent recidivism?

We'll never know unless we do the research, Kiehl says: "We just have no idea how their brains are different, how they got that way, and how we might be able to treat the condition."

Local boy does bad

Kiehl's interest in psychopathy goes back to his childhood. He grew up in a middle-class neighborhood in Tacoma, Washington, not

Online
sciencemag.org
Podcast interview with the author of this article.

This Charming Psychopath: How to Spot Social Predators Before They Attack

Written by admin on 24 February 2011

Jeffrey Dahmer. Ted Bundy. Hannibal Lecter. These are the psychopaths whose stunning lack of conscience we see in the movies and in tabloids. Yet, as this report makes abundantly clear, these predators, both male and female, haunt our everyday lives at work, at home, and in relationships. Here's how to find them before they find you.

She met him in a laundromat in London. He was open and friendly and they hit it off right away. From the start she thought he was hilarious. Of course, she'd been lonely. The weather was grim and sleety and she didn't know a soul east of the Atlantic. "Ah, travelers' loneliness," Dan crooned sympathetically over dinner. "It's the worst." After dessert he was embarrassed to discover he'd come without his wallet. She was more than happy to pay for dinner. At the pub, over drinks, he told her he was a translator for the United Nations. He was, for now, between assignments. They saw each other four times that week, five the week after. It wasn't long before he had all but moved in with Elsa. It was against her nature, but she was having the time of her life.

Still, there were details, unexplained, undiscussed, that she shoved out of her mind. He never invited her to his home; she never met his friends. One night he brought over a carton filled with tape recorders-plastic-wrapped straight from the factory, unopened; a few days later they were gone. Once she came home to find three televisions stacked in the corner. "Storing them for a friend," was all he told her. When she pressed for more he merely shrugged. Once he stayed away for three days and was lying asleep on the bed when she came in midmorning. "Where have you been?" she cried. "I've been so worried. Where were you?" He looked sour as he woke up. "Don't ever ask me that," he snapped. "I won't have it." "What-?" "Where I go, what I do, who I do it with-it doesn't concern you, Elsa. Don't ask."

He was like a different person. But then he seemed to pull himself together, shook the sleep off, and reached out to her. "I know it hurts you," he said in his old gentle way, "but I think of jealousy as a flu, and wait to get over it. And you will, baby, you will." Like a mother cat licking her kitten, he groomed her back into trusting him. One night she asked him lightly if he felt like stepping out to the corner and bringing her an ice cream. He didn't reply, and when she glanced up she found him glaring at her furiously. "Always got everything you wanted, didn't you?" he asked in a strange, snide way. "Any little thing little Elsa wanted, somebody always jumped up and ran out and bought it for her, didn't they?"

"Are you kidding? I'm not like that. What are you talking about?" He got up from the chair and walked out. She never saw him again.

There is a class of individuals who have been around forever and who are found in every race, culture, society and walk of life. Everybody has met these people, been deceived and manipulated by them, and forced to live with or repair the damage they have wrought. These often charming-but always deadly-individuals have a clinical name: psychopaths. Their hallmark is a stunning lack of conscience; their game is self-gratification at the other person's expense. Many spend time in prison, but many do not. All take far more than they give.

The most obvious expressions of psychopathy-but not the only ones-involve the flagrant violation of society's rules. Not surprisingly, many psychopaths are criminals, but many others manage to remain out of prison, using their charm and chameleon-like coloration to cut a wide swathe through society, leaving a wake of ruined lives behind them.

A major part of my own quarter-century search for answers to this enigma has been a concerted effort to develop an accurate means of detecting the psychopaths among

Readings for this lecture are posted!
Go to "Additional Readings" on class website.


DEXTER

What is Pscyhopathy?

psychopaths can function normally in society.

Special subtype of personality disorder

"mania sans de´lire"

"Madness without delirium"

19th century – Philippe Pinel

Lack of morality and behavioral control

Anthony Walsh & Huei-Hsia Wu (2008) Differentiating antisocial personality disorder, psychopathy, and sociopathy: evolutionary, genetic, neurological, and sociological considerations, Criminal Justice Studies: A Critical Journal of Crime, Law and Society, 21:2, 135-152

sociopath

- product of adverse environmental conditions
- interacting with genetic traits
- psychopath numbers are stable
- sociopath numbers change with environmental conditions
- lower social classes; dysfunctional families

psychopath

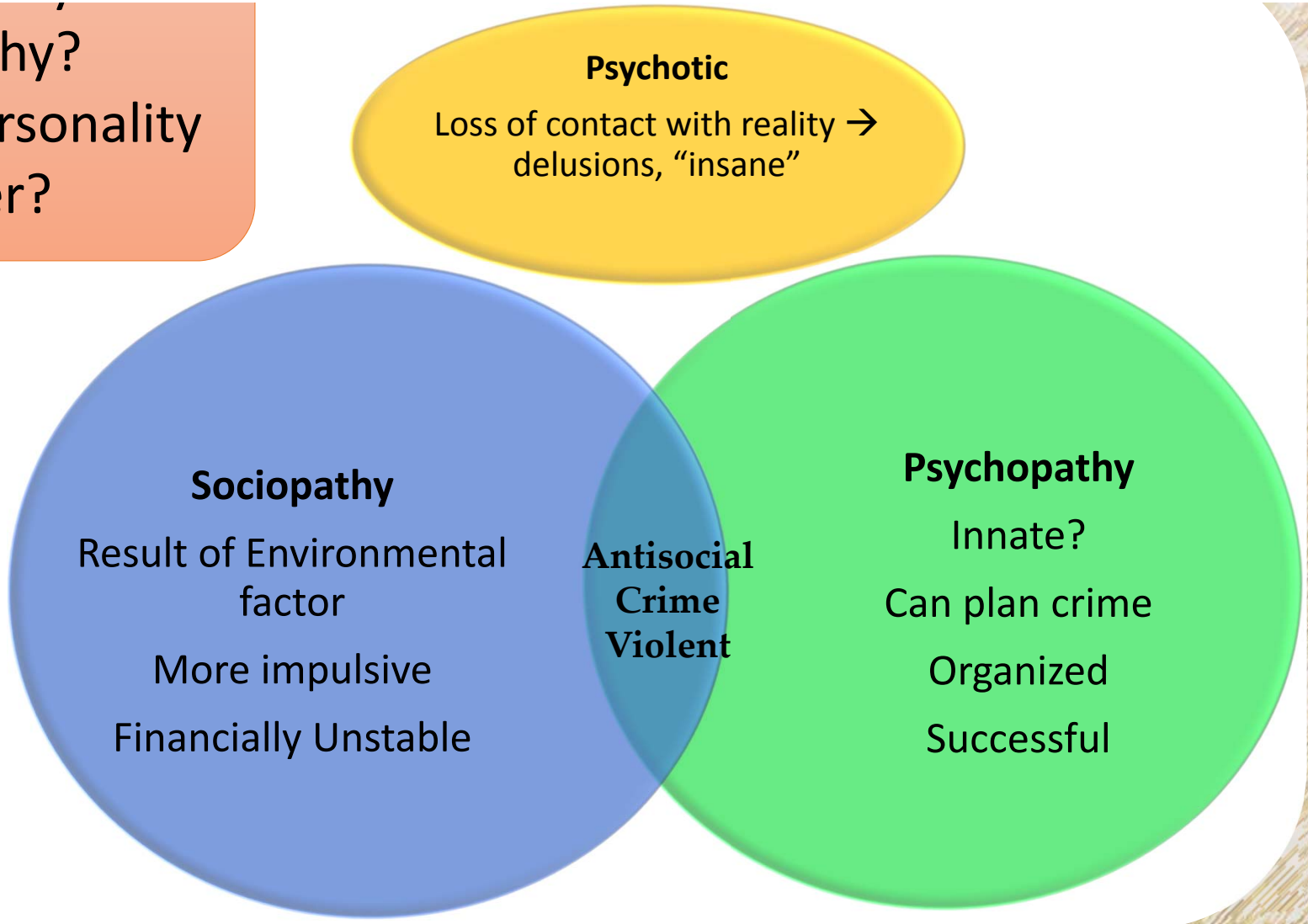
- Aristotle "brutish nature"
- preliterate cultures have psychopaths
- morally bankrupt but do not show signs of mental illness
- biological in origin
- psychopath may or may not engage in criminal behavior

antisocial personality disorder:

1. failure to conform to social norms
2. deceitfulness (lying, aliases, conning)
3. impulsivity and failing to plan ahead
4. irritability and aggressiveness
5. reckless disregard of safety for self and others
6. consistent irresponsibility
7. lack of remorse

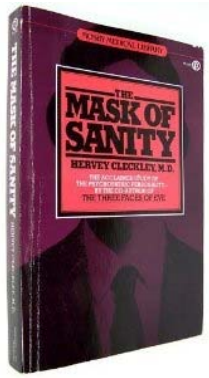
Anthony Walsh & Huei-Hsia Wu (2008) A Critical Journal of Crime, Law and Society, 21:2, 135-152

sociopathy?
anti-social personality disorder?



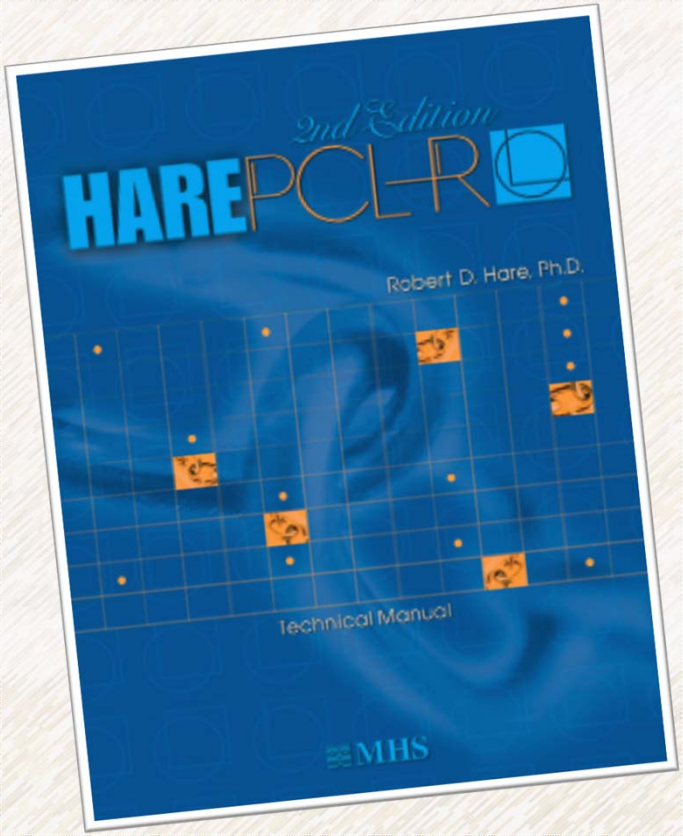
Anthony Walsh & Huei-Hsia Wu (2008) A Critical Journal of Crime, Law and Society, 21:2, 135-152

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)

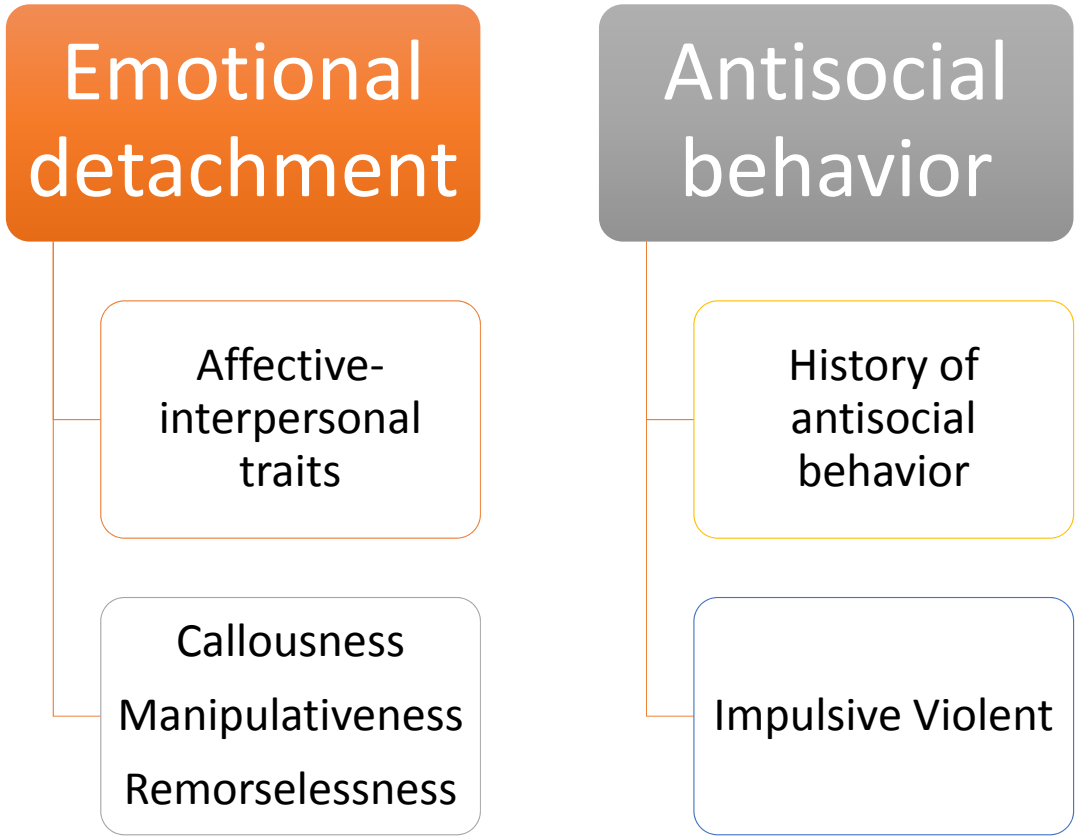


A standardized semi-structured interview based on two factors

1. emotional detachment
2. antisocial behavior

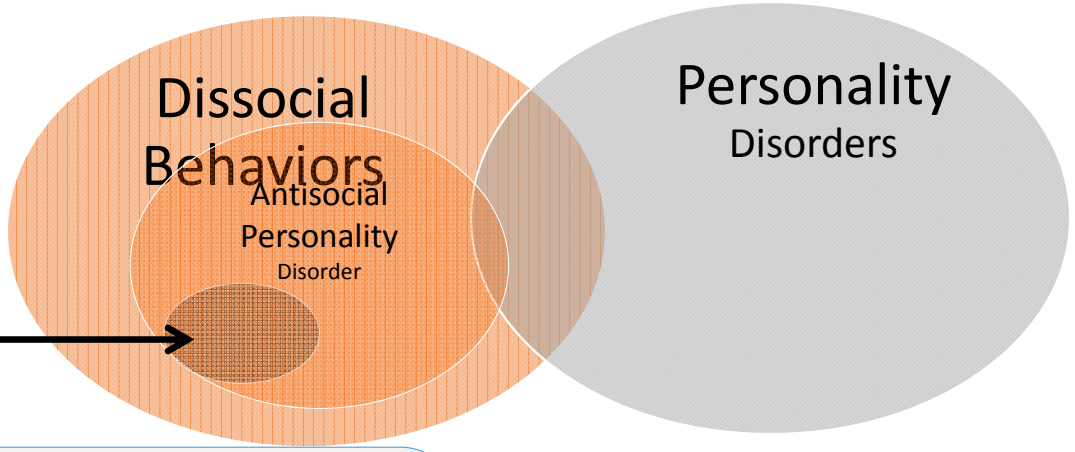
http://www.hare.org/

Two factors influencing PCL-R score:



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

PCL-R, someone with an antisocial personality disorder will score highly on Factor 2.



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

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

Behavioral Sciences and the Law
Behav. Sci. Law **26**: 7–28 (2008)
Published online in Wiley InterScience
(www.interscience.wiley.com) DOI: 10.1002/bsl.802

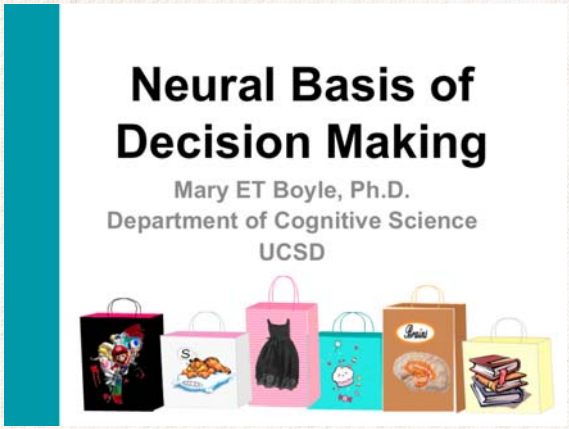
Structural Brain Abnormalities in Psychopaths—a Review

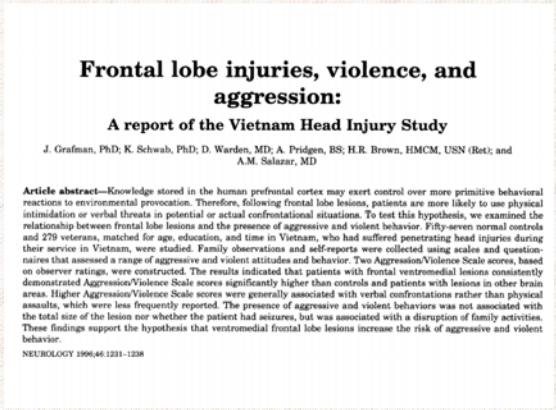
Sabrina Weber, M.Sc.,* Ute Habel, Ph.D.,†
Katrin Amunts, M.D.†,‡
and Frank Schneider, M.D., Ph.D.†

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

Aquired sociopathy - pseudopsychopathy?

Recall:





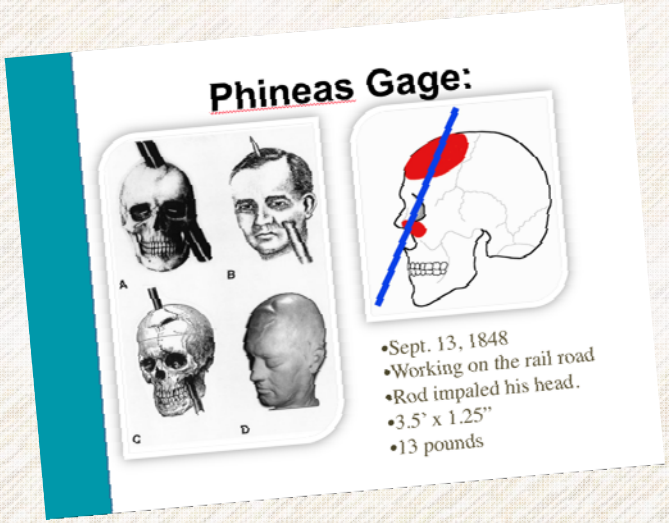
Frontal lobe injuries, violence, and aggression:

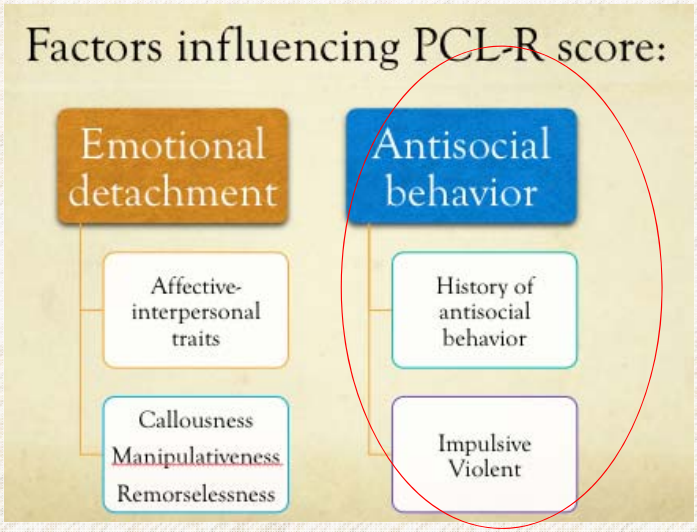
A report of the Vietnam Head Injury Study

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

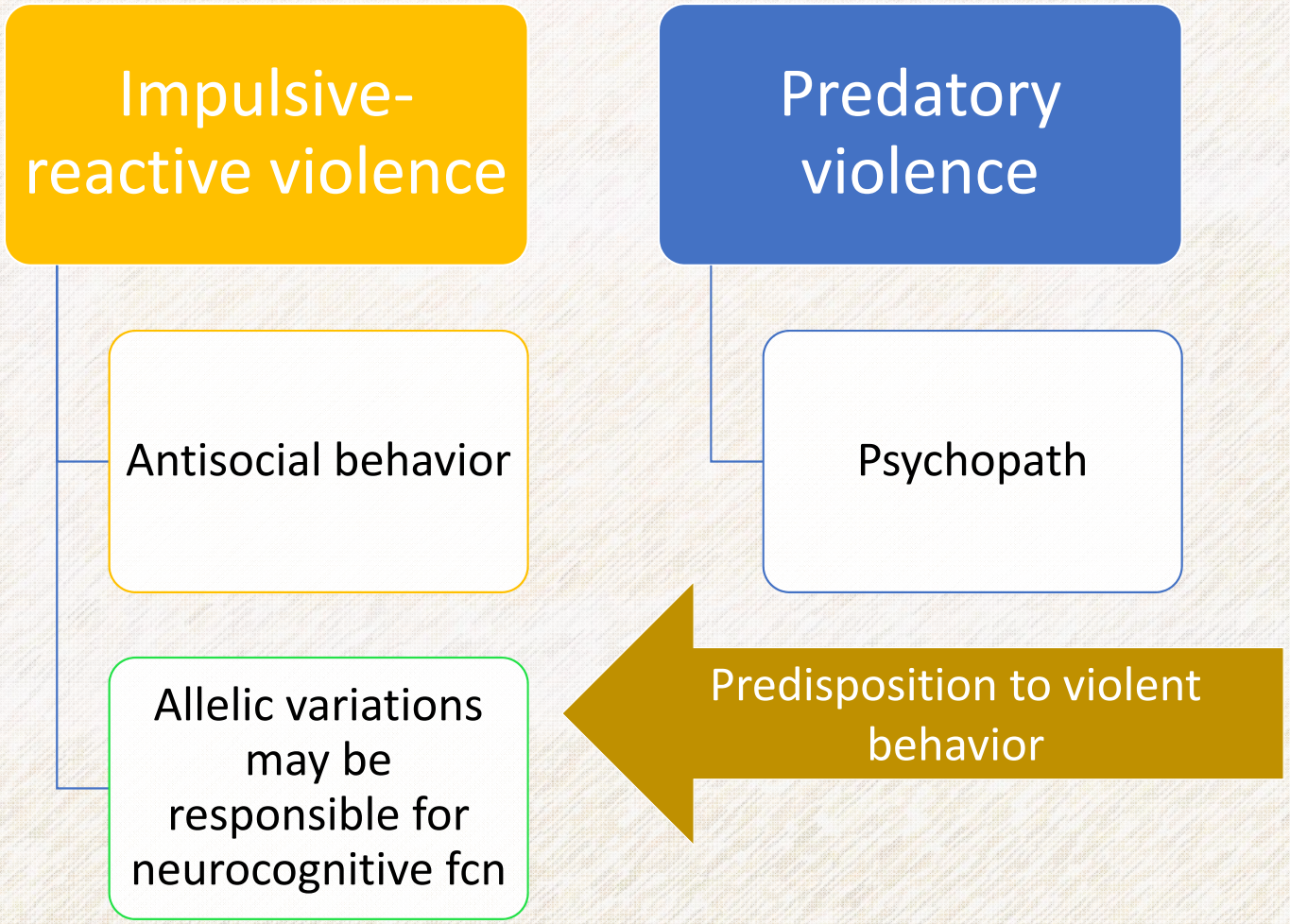
Article abstract—Knowledge stored in the human prefrontal cortex may exert control over more primitive behavioral reactions to environmental provocation. Therefore, following frontal lobe lesions, patients are more likely to use physical intimidation or verbal threats in potential or actual confrontational 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

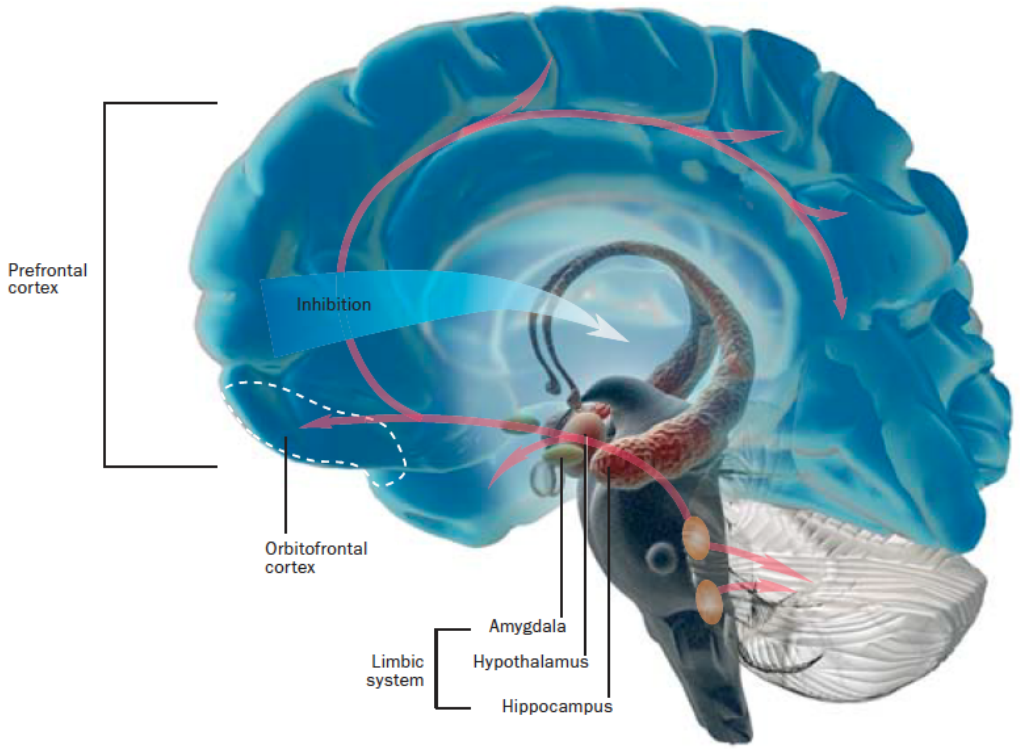




Is there a biological bases to distinguish these two types of aggression?



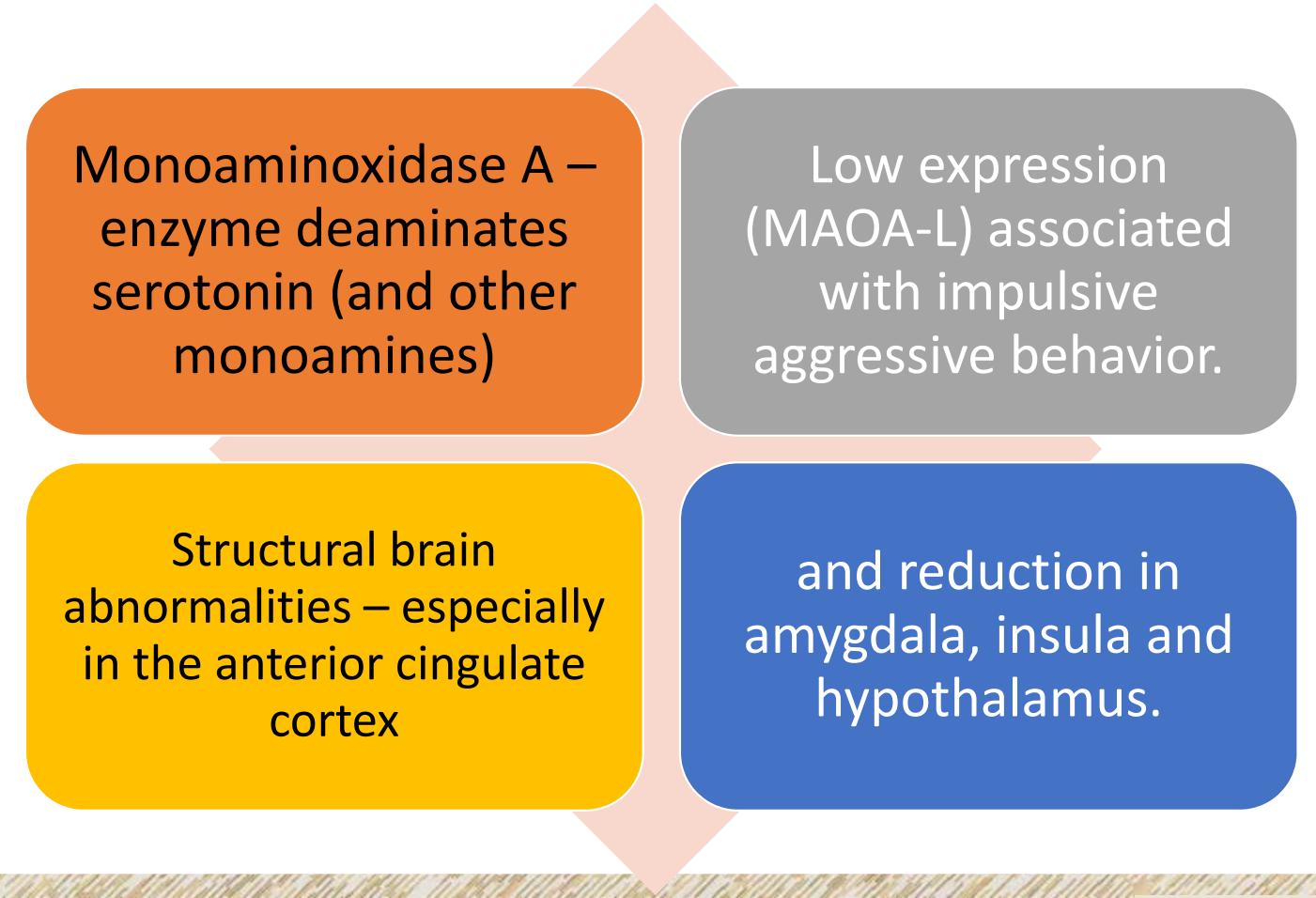
Anatomy of Aggression



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.*

Strueber, D. et al Scientific American Mind (2006)

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



Meyer-Lindenberg, et al (2006)

Nature and Nurture?

Increased serotonin availability is frequently associated with anxiety – therefore, MAOA-L carriers could have a predisposition toward neural hyper-reactivity to a threat and environmental maltreatment.

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."

Viding and Frith (2006) PNAS vol. 103 no. 16 6085–6086

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)

differences at the neural level to angry & fearful facial expression images

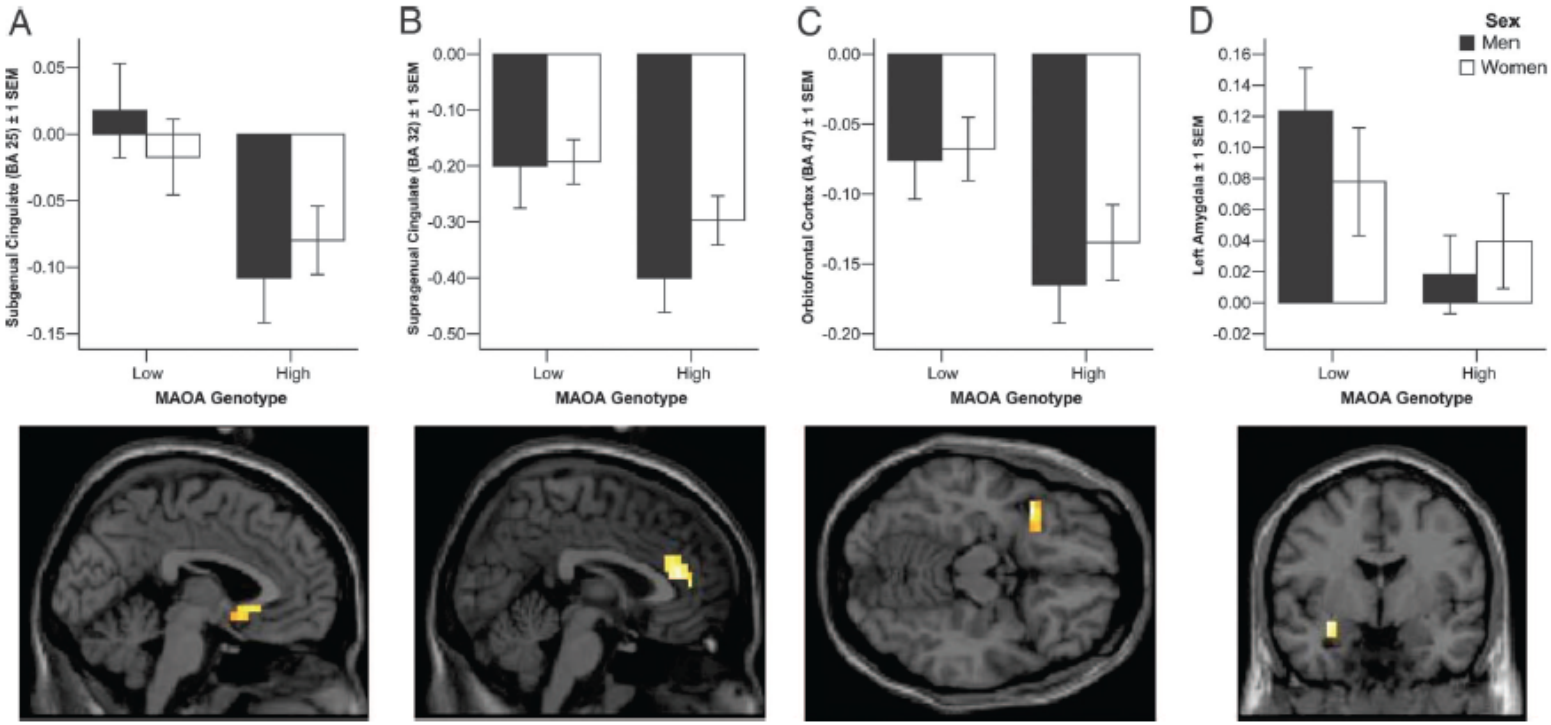


Fig. 2. Thresholded (**P**0.05, corrected for multiple comparisons in the ROI) statistical maps and plots of percent blood oxygen level-dependent (BOLD) signal change (mean 1 SEM) illustrate differential activation to angry and fearful facial expressions in **MAOA-L** individuals in several limbic and paralimbic regions (**n** 142): subgenual anterior cingulate (BA 25) (**A**), supragenual anterior cingulate (BA 32) (**B**), left lateral OFC (BA 47) (**C**), and left amygdala (**D**).

Meyer-Lindenberg et al. (2006) PNAS April 18, 2006 vol. 103 no. 16