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Neuroprediction and Criminal Law

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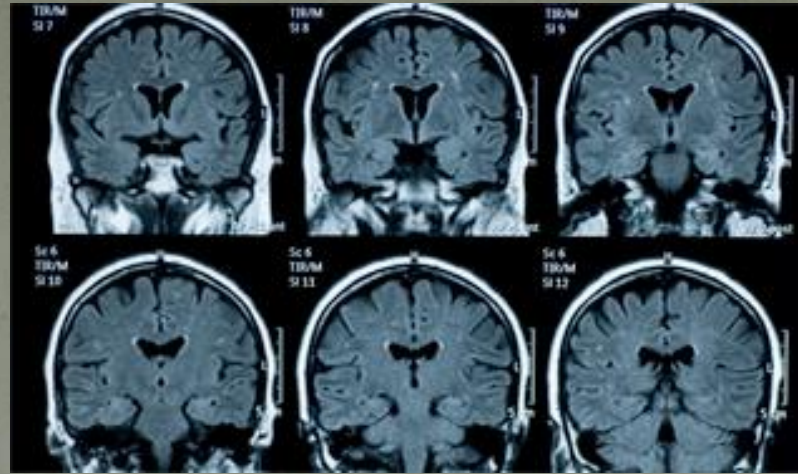
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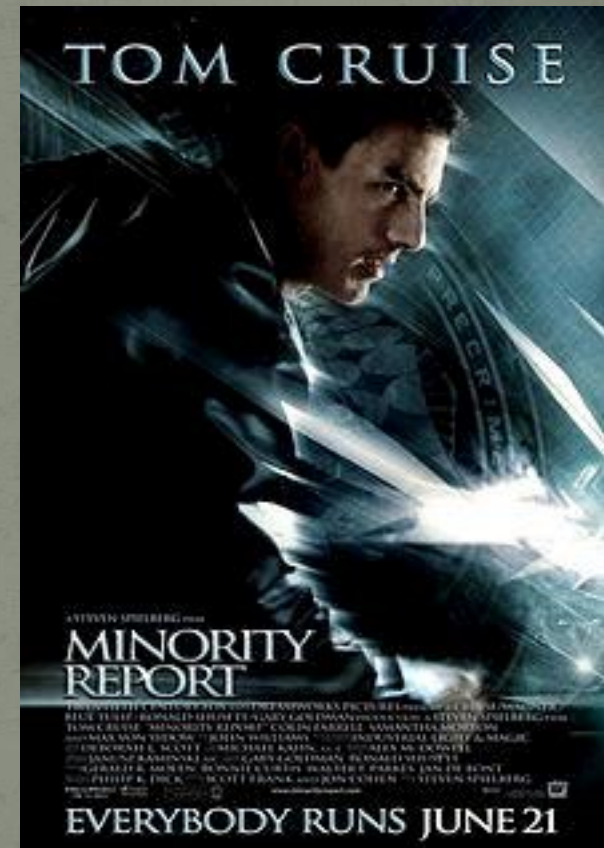
Neuroprediction and Criminal Law

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Minority Report

- *Minority Report*—based on a Philip K. Dick short story—is set in 2054.
- In the movie, the “precrime” unit of the police department arrests (pre-)criminals based on “foreknoweldge.”



Pre-cognition

- The foreknowledge is generated by three “precogs”—psychics who can see the future.
- Ideally, they agree on what this future looks like; if not, a “minority report” is generated.



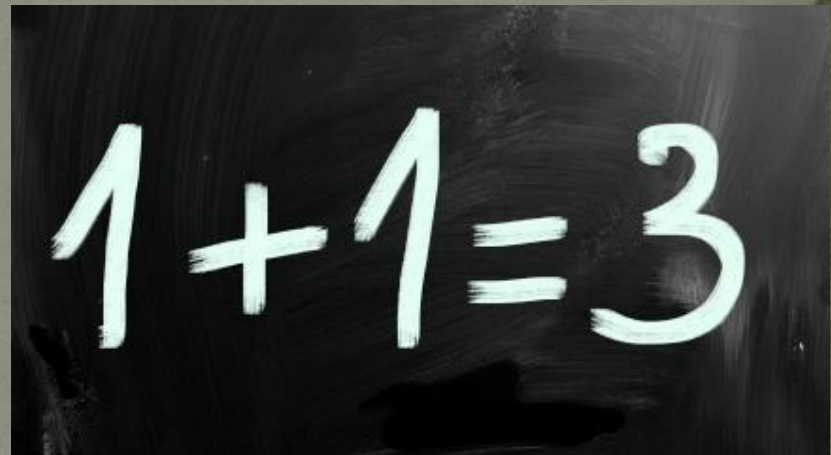
Utopia or Dystopia?

- Part of what makes the premise compelling is that it synthesizes utopian and dystopian elements:
- The utopian is that crime has largely been eliminated; would-be criminals are stopped *before* their transgressions.
- But the dystopian is two-fold: both with regards to a pessimistic account of free will, coupled with state-sanctioned surveillance.



Science or Science Fiction?

- Dialing back from the “foreknowledge” in *Minority Report*, we already know that a range of features predict criminality.
- It is important to emphasize that these predictors are *fallible*, which is to say that the correlations are not perfect.



Correlates of Criminality: Social

- Some of the correlates of criminality we might call *social*. These include things like:
 - age (younger = higher disposition)
 - marital status (single = higher disposition)
 - education (lower = higher disposition)
- Actuarial tables make these *trends* unambiguous, but what are the implications for *individuals*?

| Exact age | Male | | | Female | | |
|-----------|--------------------------------|------------------------------|-----------------|--------------------------------|------------------------------|-----------------|
| | Death probability ¹ | Number of lives ² | Life expectancy | Death probability ¹ | Number of lives ² | Life expectancy |
| 45 | 0.003543 | 94,209 | 33.33 | 0.002174 | 96,776 | 37.24 |
| 46 | 0.003826 | 93,875 | 32.45 | 0.002375 | 96,566 | 36.32 |
| 47 | 0.004208 | 93,513 | 31.57 | 0.002582 | 96,336 | 35.41 |
| 48 | 0.004603 | 93,120 | 30.71 | 0.002794 | 96,087 | 34.50 |
| 49 | 0.005037 | 92,691 | 29.84 | 0.003012 | 95,819 | 33.59 |
| 50 | 0.005512 | 92,224 | 28.99 | 0.003255 | 95,530 | 32.69 |
| 51 | 0.006008 | 91,716 | 28.15 | 0.003517 | 95,219 | 31.80 |
| 52 | 0.006500 | 91,165 | 27.32 | 0.003782 | 94,885 | 30.91 |
| 53 | 0.006977 | 90,572 | 26.49 | 0.004045 | 94,526 | 30.02 |
| 54 | 0.007456 | 89,940 | 25.68 | 0.004318 | 94,143 | 29.14 |
| 55 | 0.007973 | 89,270 | 24.87 | 0.004619 | 93,737 | 28.27 |
| 56 | 0.008551 | 88,558 | 24.06 | 0.004965 | 93,304 | 27.40 |
| 57 | 0.009174 | 87,800 | 23.26 | 0.005366 | 92,841 | 26.55 |
| 58 | 0.009848 | 86,995 | 22.48 | 0.005830 | 92,342 | 25.67 |
| 59 | 0.010584 | 86,158 | 21.69 | 0.006358 | 91,804 | 24.82 |
| 60 | 0.011407 | 85,227 | 20.92 | 0.006961 | 91,220 | 23.97 |
| 61 | 0.012315 | 84,254 | 20.16 | 0.007624 | 90,585 | 23.14 |
| 62 | 0.013289 | 83,217 | 19.40 | 0.008322 | 89,895 | 22.31 |
| 63 | 0.014326 | 82,111 | 18.66 | 0.009046 | 89,147 | 21.49 |
| 64 | 0.015433 | 80,935 | 17.92 | 0.009822 | 88,340 | 20.69 |
| 65 | 0.016723 | 79,684 | 17.19 | 0.010698 | 87,473 | 19.89 |
| 66 | 0.018154 | 78,351 | 16.48 | 0.011702 | 86,537 | 19.10 |
| 67 | 0.019732 | 76,929 | 15.77 | 0.012832 | 85,524 | 18.32 |
| 68 | 0.021468 | 75,411 | 15.08 | 0.014103 | 84,427 | 17.55 |
| 69 | 0.023387 | 73,792 | 14.40 | 0.015526 | 83,236 | 16.79 |
| 70 | 0.025579 | 72,066 | 13.73 | 0.017163 | 81,944 | 16.05 |
| 71 | 0.028032 | 70,223 | 13.08 | 0.018987 | 80,537 | 15.32 |
| 72 | 0.030865 | 68,254 | 12.44 | 0.020922 | 79,008 | 14.61 |
| 73 | 0.033967 | 66,161 | 11.82 | 0.022951 | 77,355 | 13.91 |
| 74 | 0.036519 | 63,947 | 11.21 | 0.025147 | 75,580 | 13.22 |
| 75 | 0.040010 | 61,612 | 10.62 | 0.027709 | 73,679 | 12.55 |

Correlates of Criminality: Biological

- Others we might call *biological*. These include:
 1. race (some minorities = higher).
 2. genetics (“warrior gene”; alleles that produce monoamine oxidase A (MAOA), an enzyme that affects the neurotransmitters dopamine, norepinephrine, and serotonin).
- Again, not *perfect predictors*.



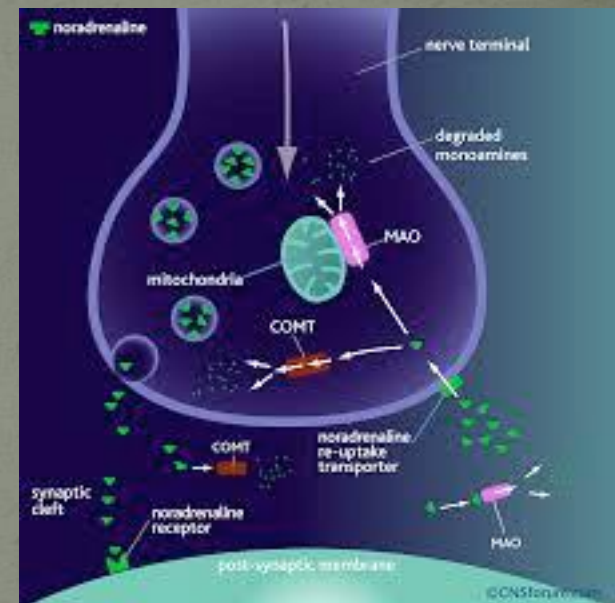
Correlates of Criminality: Psychopathy

- Enter psychopaths, who manifest a developmental disorder that often leads to persistent antisocial behavior; they comprise ~1% of the general population, but ~15% of the prison population.
- Psychopaths are notoriously domineering, exploitative of others, and deficient—or lacking—in social emotions like guilt, remorse, and empathy.
- They are also hyper-aggressive, predatory, and recidivistic.



Correlates of Criminality: Psychopathy

- Many results establish neurochemical bases of psychopathy:
 1. The neurotransmitter noradrenaline plays an important role in the deficits associated with psychopathy.
 2. Administering noradrenaline antagonists reduces impact of adverse decision-making cues.
 3. Amygdala activity is also reduced by administration of noradrenaline antagonists.
 4. Differences between psychopaths and non-psychopaths on cortisol function.



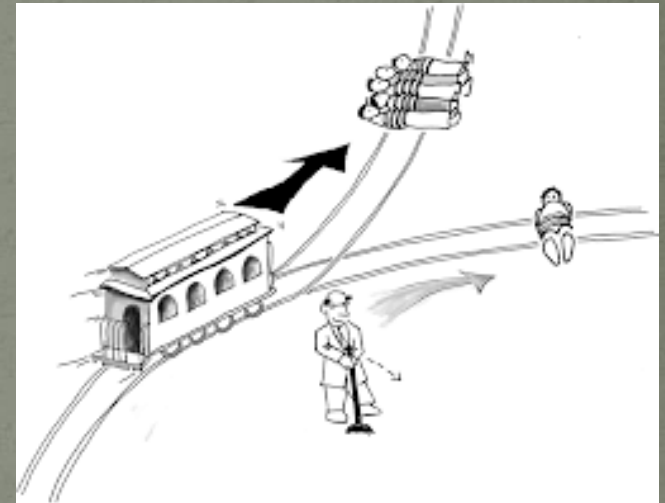
Correlates of Criminality: So What?

- And others; criminologists have made much progress understanding social and biological correlates of criminality.
- But a key ethical question, already foreshadowed, is what to make of these increased propensities.



A Thought Experiment

- Say, for example, that in virtue of bio-/social/neural predictors, some individual were 33% more likely to commit crime than some 3% baseline: 4% likely to commit crime.
- Say that this increased propensity pertained to some already-fraught category, like race.



Pre-Arrest?

- It's *very implausible* that we are going to “pre-arrest” (or “pre-”anything, like probation, surveillance, etc.) this sort of person. And for a range of reasons:
 - 1. statistical (i.e., +33% or 4% total is too low);
 - 2. ethical (i.e., racist, anti-individualist, etc.); or
 - 3. legal (Fourth, Fifth, Fourteenth Amendments).



A (Revised) Thought Experiment

- But what is the case were different? Take the psychopath, and suppose we have 90% probability that this person will commit crimes.
- Further suppose that we know who the psychopaths are from the revised psychopathy checklist (PCL-R).
- Would interventions be appropriate here? If so, which?



What Matters?

- My intuitions are *substantially* different in this case, for a couple reasons:
 1. The *statistics* are far more predictive.
 2. The *predictor* is less morally fraught; psychopaths are bad people.



Pre-Probation?

- But, I still have worries about what the interventions could be.
- Pre-arrest has to be out. Even 90% isn't 100%, but, if it were, the due process considerations are substantial.
- What about pre-probation? More promising. Special tribunals to pre-authorize? (Or bad: FISA, torture warrants, etc.?)



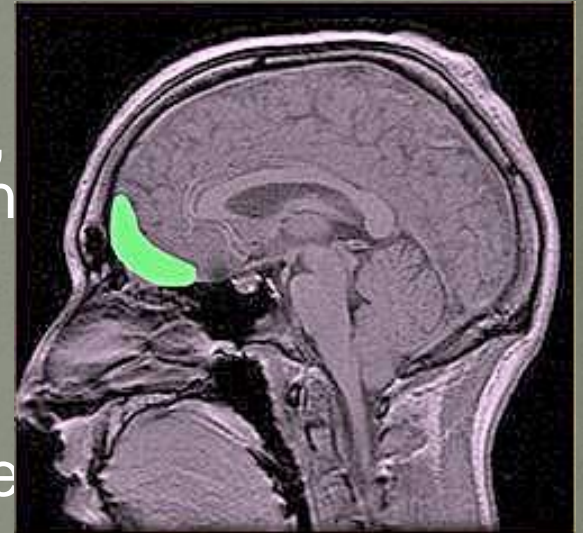
Neuromitigation

- So far, we have talked about *neuroprediction*, which would identify criminals *before* crimes occur.
- But we can also talk about *neuromitigation*, which would go to sentencing *after* crimes have occurred.



Brain Tumors and Pedophilia

- A Virginia man led a completely normal life, happily married with children, stable job.
- Around age 40, his behavior changed, including lewd treatment of women, an obsession with pedophilia, and abuse of his stepdaughter.
- He was arrested and convicted; before sentencing, he complained of headaches, got an MRI, and was diagnosed with tumor in right frontal lobe of orbitofrontal cortex—a region tied to judgment, impulse control, and social behavior.



Moving Forward

- And so this portends another important frontier in neurolaw.
- What do we do with such cases? How do they affect our conceptions of free will, moral responsibility, criminal/civil liability, and so on?
- Can/should these cases be slotted into existing legal doctrine? Are they fully exculpatory (cf., insanity, but with civil commitment a possibility)? Or partially (cf., diminished capacity)?

