Genetics of Antisocial Behavior: An Expert Witness Perspective

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Potential Scope of Expert Testimony is Broad

- Denno surveyed case law from 1994-2007 and found at least 48 criminal cases involving behavioral genetic data

- Uses:
  - Culpability/responsibility
  - Likelihood of future dangerousness
  - Proof of diagnosis
  - Ineffective assistance of counsel

  (Denno, 2009)
Genes Associated with Criminality

- In addition to MAOA, include:
  - Dopamine transporter (DAT1)
  - Dopamine receptor (DRD2)
  - Serotonin transporter (5HTTLPR)
  - Catechol-O-Methyltransferase (COMT)

- But MAOA, in particular, has led to much speculation about the impact of behavioral genetics on criminal law
How Should Genetics Affect Determinations of Culpability?

Dilemma: Anglo-American law has created categories to excuse defendants from culpability when their capacity to choose their behavior is significantly impaired (e.g., insanity defense, automatism defense).

If mental disorders that impair appreciation of wrongfulness or ability to control behavior negate culpability, why shouldn’t genetic determinants (e.g., low MAOA activity) have the same effect?
An actor is excused for his or her conduct constituting an offense if, as a result of

(1) genetic predisposition

(2) the actor

   (a) Does not perceive the physical nature or consequence of his or her conduct,
   (b) Does not know his conduct is wrong or criminal, or
   (c) Is not sufficiently able to control his or her conduct so as to be held accountable for it

(Johnson, 1998)
Early Attempts at Genetic Defense: The XYY Cases

- In the 1970s, some evidence suggested that men with an extra Y (sex) chromosome were at increased risk for acts of violence.
- Several defendants attempted to introduce evidence of their XYY status to negate their culpability.
- Courts uniformly rejected the defense.
- Link later disproved.
Legal Skepticism About Non-Culpability Defenses

“Almost all of the traditional purposes of the criminal law can be significantly served by punishing the person who in fact committed the proscribed act, without regard to whether his action was ‘compelled’ by some elusive ‘irresponsible’ aspect of his personality…”

Justice Black’s concurrence in *Robinson v. California* (1962)
Causal Influences and Criminal Behavior

- Legal skepticism reflects law’s view of persons as intentional actors.
- Recognizes all behavior as subject to causal influences (e.g., social, interpersonal, biological).
- But mere presence of causal influences doesn’t negate ultimate responsibility to control behavior.
- Only when influences overwhelm rationality and/or ability to control behavior will law recognize a state of non-culpability.
Issues in Genetics as Excuse: Causation

- Nature of genetic evidence will likely make it difficult to meet existing standards for exculpation.
- Most genetic data will demonstrate predisposition to criminal/violent behavior, but will not be able to establish a definitive causal link (e.g., MAOA).
  - In traditional mental state defense, causal link established by expert testimony.
  - Here, however, the most expert can testify to is increased likelihood of behavior associated with genetic endowment.
Cross-examination of psychologist who introduced data on defendant’s MAOA alleles

- “Are you saying that the defendant, because he has the MAOA gene and because in your opinion he suffered maltreatment, was unable to control his behavior and that caused him to commit these 3 murders?”
- “No, I’m not.”
- “And in fact, the defendant could easily have made a choice as to whether or not he wanted to commit 3 murders, couldn’t he?”
Example of Difficulties in Genetic Claims - 2

- “I don’t know how easy or difficult his choices are.”

- “But there’s nothing in the MAOA gene or the severe maltreatment that would make him commit these murders, is there?”

- “I don’t know.”

State v. Adams transcript
Issues in Genetics as Excuse: Propensity Evidence

- Genetic evidence demonstrating propensity may run afoul of admissibility standards
  - FRE Rule 404a: “Evidence of a person's character or a trait of character is not admissible for the purpose of proving action in conformity therewith on a particular occasion...”
  - Can’t use genetic evidence to demonstrate guilt—but may not be able to use it for exculpation either
  - Awaiting judicial clarification
Arguments based on genetic predispositions face substantial obstacles when introduced to support claims that defendant should be excused from responsibility for criminal behavior.

Limited use to date reflects these difficulties in applying genetic evidence to standard legal rules.
How Should Genetics Affect Sentencing?

- Even if genetic predispositions are not exculpatory, perhaps they should be seen as mitigating and be taken into account at sentencing.
- Argument would be that the defendant’s capacity to choose not to commit a crime is impaired, even if not negated by a genetic predisposition—akin to a diminished responsibility claim.
Limited Success of Genetic Claims at Sentencing

- In *Mobley v. State*, soon after link between MAOA and criminality was discovered, convicted murder defendant petitioned the court for funds to test his MAOA activity (Mobley v. State, 1995)

- Request was rejected on the grounds that scientific evidence of a link between enzyme levels and behavior had not reached a “verifiable certainty”

- Rationale does suggest willingness to admit evidence as new data become available
Some Success in Other Countries

- Recent report of case from Italy where sentence reduced in murder case (but only from 9 yrs. to 8 yrs.) based on genetic propensity evidence
Issues in Genetics as Mitigation: Admissibility

Genetic evidence must meet standards for admission as scientific evidence, including:

- Theory or technique must be falsifiable, refutable, and testable
- Subjected to peer review and publication
- Known or potential error rate
- Standards and controls concerning its operation
- Generally accepted by relevant scientific community

(Daubert v. Merrell-Dow)
Future of Genetic Claims at Sentencing

- Interesting that so few cases to date have raised genetic claims—but likely to change—some forensic evaluators getting tests routinely

- Newest approach involves multimodal evaluation
  - Neuropsychological testing
  - Functional neuroimaging
  - Genetic testing of multiple genes
Issues in Genetics as Mitigation: Interpretation

- Whether genetic propensity to commit criminal acts *should* mitigate is unclear
  - Unlike mental illnesses, genetic propensities are not treatable at this point
  - Hence, defendants with such propensities may be most likely to recidivate—odd basis for leniency
Issues in Genetics as Mitigation: Double-Edged Sword

- Could genetic information also be introduced as aggravating evidence?
- E.g., would MAOA data be relevant in Texas, where death penalty requires determination that defendant is likely to commit future acts of violence?
“[We find it] highly doubtful that the sentencing court would have been moved by information that Landrigan was a remorseless, violent killer because he was genetically programmed to be violent...Although Landrigan’s new evidence can be called mitigating in some slight sense, it would also have shown the court that it could anticipate that he would continue to be violent...On this record, assuring the court that genetics made him the way he is could not have been very helpful.”

Landrigan v. Stewart, 272 F.3d 1221 (9th Cir. 2001)
Conclusions

- Despite much discussion regarding the use of genetic evidence for purposes of exculpation and mitigation, there are many obstacles to such uses.

- For now, efforts are likely to continue, but future of forensic genetic evidence may lie primarily in other areas (e.g., diagnosis).