Guarding the Gate:
Limiting the Use of Immature Brain Science To Assess Adolescent Maturity

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How Does Brain Science Make it Into the Courtroom?

Directly – through presentation of expert witnesses

Indirectly – advocacy, CLE, media, books, articles

This session will discuss:

1) limitations of neuroscience and neuroimaging when determining adolescent maturity
2) *Daubert* and *Joiner* issues surrounding neuroscientific evidence,
3) unintended policy consequences from misapplied science, and
4) a multi-factor approach to considering developmental maturity of court-involved youth.

Limitations of the Science

What the Researchers Say

Adolescent Maturity and the Brain: The Promise and Pitfalls of Neuroscience Research in Adolescent Health Policy; Sara B. Johnson, Ph.D., M.P.H, Robert W. Blum, M.D., Ph.D., Jay N. Giedd, M.D., Journal of Adolescent Health 45 (2009) 216-221

"Neuroimaging research is in its infancy."

"As of yet, neuroimaging studies do not allow a chronologic cut-point for behavioral or cognitive maturity at either the individual or population level."

"Despite being popularly viewed as revealing the "objective truth," neuroimaging techniques involve an element of subjectivity. Investigators make choices about thickness of brain slices, level of clarity and detail, techniques for filtering signal from noise, and choice of the individuals to be sampled."

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"Furthermore, the cognitive or behavioral implications of a given brain image or pattern of activation are not necessarily straightforward. Researchers generally take pains to highlight the correlative nature of the relationship; however, such statements are often misinterpreted as causal."

"Some neuroscientists lament that the technology has been used too liberally to draw conclusions where there is little empirical basis for interpreting the results."

" Neuroimaging technologies have made more information available about the structure and function of the brain than ever before. Nonetheless, there is still a dearth of empirical evidence that allows us to anticipate behavior in the real world based on performance in the scanner."

Daubert, Joiner and Neuroscience Evidence

Frye v. United States
293 F 1013 DC Circuit (1923)

General acceptance in the scientific community

"Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently establish to have a gained general acceptance in the particular field in which it belongs."

Federal Rule of Evidence 702 Testimony of Expert Witnesses

A witness qualified as expert by knowledge, skill, experience, training or education may testify in the form of an opinion or otherwise if:

a) expert's specialized knowledge will help the trier of fact understand the evidence or determine a fact in issue;

b) the testimony is based on sufficient facts or data;

c) the testimony is the product of reliable principles or methods; and

d) the expert has reliably applied the principles and methods to the facts of the case.

Daubert v. Merrell Dow Pharmaceuticals 509 U.S. 579 (1993)

4 part test to determine whether scientific theory / technique is scientific knowledge that will assist the trier of fact

1) Whether the theory or technique can be and/or has been tested?

2) Whether it has been subjected to peer review?

3) Whether there is a known or potential error rate for the technique?

4) Whether the technique has gained acceptance within the relevant scientific community?

G.E. v. Joiner
522 U.S. 136 (1997)

Opinions from existing data

"Trained experts commonly extrapolate from existing data. But nothing in either Daubert or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion offered."

Kumho Tire v. Carmichael 526 U.S. 137 (1999)

Judicial gatekeeping required for all types of expert testimony

FRE 702 establishes a standard of evidentiary reliability for all expert testimony.

For purposes of FRE 702, there is no difference between "scientific knowledge," and "technical" or "other specialized" knowledge.

Not all Daubert factors will apply in every case.

Applying Daubert to the Neuroscience

Determining adolescent maturity from MRIs, fMRIs, PET scans or other types of neuroimages fails the Daubert test.

1) Whether the theory or technique can be and/or has been tested?
   - No. *Scans are different based on the investigator capturing the image and individual being scanned.*

2) Whether it has been subjected to peer review?
   - *Yes, and the great weight of the peer review says neuroimaging shouldn't be used in this way; can't reliably determine maturity by looking at brain images.*

Applying Daubert to the Neuroscience

Determining adolescent maturity from MRIs, fMRIs, PET scans or other types of neuroimages fails the Daubert test.

3) Whether there is a known or potential error rate?

- *No. Same as the first factor. Scans are different based on the investigator capturing the image and individual being scanned.*

4) Whether the technique has gained acceptance in the relevant scientific community?

- *No. It's the relevant scientific community stating that the conclusions being drawn are flawed – that they are unsupported by the science being relied upon.*

Applying Joiner to the Neuroscience

Opinions about adolescent immaturity based on neuroimages cannot bridge the analytical gap identified in the scientific literature.

FRE 702 requires that expert opinion evidence be relevant and that "the expert has reliably applied the principles and methods to the facts of the case."

As the Joiner case points out, nothing "…requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert."

Unintended Consequences of Misapplied Science

Raise the Age

NY and NC moving from 16 years to 18 years

Some advocacy groups and academics suggest the jurisdictional limit should be 24 years of age;

If juveniles are not mature enough to make decisions about their behavior, the criminal nature of it, and the short term and long term consequences of it, then that lack of maturity has implications for other decisions juveniles are currently entrusted to make.

“Hot v. Cold cognition” may not be helpful here.

Unintended Consequences

- Military service
- Health care
- Contracts
- Owning land
- Voting
- Driver's license
- Marriage
- Emancipation
- Consent to sex

Multi-factor approach to developmental maturity

Everything Old is New Again

Research establishes that behavior in adolescence is a multi-factor analysis.

"Further hindering extrapolation from the laboratory to the real world is the fact that it is virtually impossible to parse the role of the brain from other biological systems and contexts that shape human behavior." *Johnson, et. al.*

*"*Behavior in adolescence, and across the lifespan, is a function of multiple interactive influences including experience, parenting, socio-economic status, individual agency and self-efficacy, nutrition, culture, psychological well-being, the physical and built environments, and social relationships and interactions." *Johnson, et. al.*

Everything Old is New Again

Kent v. United States, 383 U.S. 541 (1966)

In Kent, the Supreme Court determined that meaningful due process before a juvenile can be transferred to criminal court requires a hearing, and production of the social records, probation reports and any other similar reports to the juvenile's attorney. The court is also required to document the findings underlying the decision.

The Court attached as an Appendix to its decision, a policy memorandum from 1959 interpreting the waiver and transfer provision of Juvenile Court Act in Washington, D.C.

The statute permitted transfer for offenders 16yoa or older who were charged with felonies; and children who were charged with capital crimes.

Everything Old is New Again

Kent v. United States, 383 U.S. 541 (1966)

The policy memo called for the transfer of the juvenile to criminal court if:

- ✓It the case had prosecutorial merit
- ✓It was a heinous or aggravated crime
- ✓Or a less serious crime, if its part of a repetitive pattern of behavior suggestion the youth was not amenable to rehabilitation in the juvenile court
- ✓Public safety required it

Everything Old is New Again

Kent v. United States, 383 U.S. 541 (1966)

Factors to consider in transfer decisions:

- Serious of offense and public safety
- Violent, aggressive, premeditated, willful
- Crime against persons or property
- Prosecutorial merit of the case
- Desirability of adjudication and sentencing in one court for all co-defendants
- Previous record
- Rehabilitation prospects
- Sophistication and maturity of the juvenile as determined by consideration of his:
  - Home
  - Environmental situation
  - Emotional attitude
  - Pattern of living

DOES THIS SOUND FAMILIAR?

Everything Old is New Again

RESEARCH

Experience, parenting, socio-economic status, individual agency and self-efficacy, nutrition, culture, psychological well-being, the physical and built environments, and social relationships and interactions

Johnson, et. al.

KENT FACTORS

Sophistication and maturity of the juvenile as determined by consideration of his:

- Home
- Environmental situation
- Emotional attitude
- Pattern of living

CONCLUSION

- Neuroimaging confirms what courts have known for decades. Juveniles are physically, mentally, emotionally and developmentally different than adults.

- Courts should consider all aspects of a juvenile offender's environment, physical and emotional characteristics, life experiences.

- Misapplying the neuroscience and neuroimaging may establish unsustainable policy and precedent that lead to harsh and unintended course corrections in the future.

Resources

The False Promise Of Adolescent Brain Science In Juvenile Justice; Maroney, Terry A.; Notre Dame L. Review Vol 85:1 (2009)

Adolescent Brain Science after Graham v. Florida, Maroney, Terry A. Essay; Notre Dame L.

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Psychosocial Maturity and Desistance from Crime in a Sample of Serious Juvenile Offenders; Steinberg, Laurence; Cauffman, Elizabeth; and Monahan, Kathryn; OJJDP Juvenile Justice Bulletin March 2015 (available online)

Effects of Adolescent Development on Policing; International Association of Chiefs of Police Brief; IACP and OJJDP (available online)

Age of Opportunity – Lessons from the New Science of Adolescence; Steinberg, Laurence; Houghton Mifflin Harcourt 2014 ISBN 978-0-544-27977-3

Resources

Adolescent Maturity and the Brain: The Promise and Pitfalls of Neuroscience Research in Adolescent Health Policy; Johnson, Sara B., Blum, Robert W., Giedd, Jay N. Journal of Adolescent Health 45 (2009) 216-221

ACEs study: https://www.cdc.gov/violenceprevention/acestudy/

Under the Radar: Neuroimaging Evidence in the Criminal Courtroom; Gaudet, Lyn M. Marchant, Gary E., Drake Law Review Vol 64 Pg 577 (2016)

Resources

Kent v. United States, 383 U.S. 541 (1966)

Hodgson v. Minn, 497 U.S. 417 (1990)

Roper v. Simmons, 543 U.S. 551 (2005)

Miller v. Alabama, 132 S.Ct. 2455 (2012)

J.D.B. v. North Carolina, 564 U.S. 261 (2011)

Frye v. United States, 293 F. 1013, DC Circuit (1923)

Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579 (1993)

G.E. Co. v. Joiner, 522 U.S. 136 (1997)

Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999)