The Twelve Decade Neuroscience Study: 1900 - 2022

Deborah W. Denno, Ph.D., J.D.
Arthur A. McGivney Professor of Law
Founding Director, Neuroscience and Law Center
Fordham University School of Law

Prepared for the 2025 AALS Section on the Empirical Study of Legal Education and the Legal Profession

Please Do Not Cite or Quote without the Author's Permission

Two Points to this Talk

- Describe the Neuroscience Study
- Explain what the Neuroscience Study reveals

Much of the knowledge on neuroscientific evidence is based on the same handful of cases that people have discussed for decades

1848 Phineas Gage case

Neuroscience Defined

"The branch of life sciences that studies the brain and nervous systems [including] . . . brain processes such as sensation, perception, learning, memory, and movement."

American Association for the Advancement of Science

Neuroscientific evidence

"broadly construed as any information related to the brain" Darby Aono, et al.

The Neuroscience Study

- Twelve-decade study (1900 – 2022)
- Currently over 9,000 cases involving neuroscientific evidence
- Extensive and systematic empirical data that show how neuroscientific evidence is used in courtrooms
- Data used to track trends over time and examine how courts respond to this type of evidence

The Coding Process

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Case Name**		**Basic Case Information**											
2	**Identifier ("exact date decided. State")**	**Case name Case citation**	**Procedural History**	**Neuroscience Evidence Related toDefendant, Victim, or Both?**	**Neuroscience Evidence for Adult Victim or Child**	**Holding (A for Affirmed or R for Reversed); (B) If**	**Year**	**State**	**Death Penalty/ Capital Case? (Y/N)**	**Highest Count D Convicted of**	**Death**	**Life without possibility of parole**	**Life with the Possibility of Parole**	**50--31 Years**
3	07.12.2018 Pa.	**Abdul-Salaam v. Sec'y of Pennsylvania Dep't of Corr., 895 F.3d 254 (3d Cir. 2018) and Abdul-**	Defendant was convicted of first degree murder,	D		B	2018	PA	Y	Murder1/Capital Murder	X			
4	12.26.17.ID	**Adamcik v. State, 408 P.3d 474 (Id. 2017)**	Defendant, whose convictions for first degree	D		A	2017	ID	N	Murder 1		x		
5	01.19.16	**Adams v. State, 782 S.E.2d 36 (Ga. 2016)**	Defendant was convicted of malice murder and sentenced	D		A	2016	GA	N	Malice murder		X		
6	09.14.18	**Afzal v. State, 559 S.W.3d 204 (Tex. App. 2018)**	Defendant was convicted of aggravated assault of a	D		A	2018	TX	N	Aggravated assault of a public servant				X
7	09.01.16 AZ	**Aguilar v. Ryan, No. CV1402513PHXDJHBSB, 2016 WL 8944352 (D. Ariz. Sept. 1, 2016)**	D received life imprisonment sentences for 2 murders, one in	D		A (sentences affirmed, habeas corpus petition denied)	2016	AZ	N	Murder 1		X		
8	12.26.19FL	**Alexander v. State, No. 3D17-2012, 2019 WL 7174570 (Fla. Dist. Ct. App. Dec. 26, 2019)**	History: In June 2016, Mr. Alexander was charged by	D		R (reversed and remanded)	2019	FL	N	Robbery				
9	01.07.19 FL	**Allen v. State, 261 So.3d 1255 (Fla. 2019)**	D convicted of first-degree murder and kidnapping,	D		A	2019	FL	Y	Murder 1	X			
10	06.25.2014 Mo	**Allen v. U.S., No. 4:07CV00027 ERW, 2014 WL 2882495 (E.D. Mo. June 25, 2014)**	History: D was convicted of multiple crimes including	D		A (denied petition for writ of certiorari and denied	2014	MO	Y	Murder 1	x			

What the Neuroscience Study Reveals

- Neuroscientific evidence is widely used in the criminal legal system and has been for over a century.
- Neuroscientific evidence is mostly introduced by defense attorneys and only used by the prosecution in selected circumstances.
- There was no substantial double-edged sword effect with neuroscientific evidence. This evidence was mostly introduced for mitigation, but can also be used for aggravation for some cases.
- Since the 1980s, there has been an increase in the application of neuroscientific evidence in the sentencing phase.
- Neuroscientific evidence has impact, simply not in the ways that people commonly believe.
- Neuroimaging evidence is not incorporated in criminal cases as much people generally would think.