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Courts' Increasing Consideration of Behavioral Genetics Evidence in Criminal Cases: Results of a Longitudinal Study

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COURTS' INCREASING CONSIDERATION OF BEHAVIORAL GENETICS EVIDENCE IN CRIMINAL CASES: RESULTS OF A LONGITUDINAL STUDY

*Deborah W. Denno**

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INTRODUCTION

On January 8, 2011, Jared Lee Loughner unleashed tragedy on a nation with a shooting rampage in Tucson, Arizona. In a matter of minutes, Loughner killed six people, including a federal judge, and injured thirteen others, including a congresswoman.¹ Following this scene of devastation, legal attention turned to who would represent Loughner and what Loughner's defense would be. Evidence showed that the troubled Loughner had long planned his highly public acts, and he disclosed no remorse. Social outrage was huge, Loughner's legal options limited.² Yet, predictions for a defense surfaced: Loughner's attorneys would likely scrutinize Loughner's life and lineage across generations in an effort to garner him an insanity defense or avoid the death penalty.³ Indeed, a few months later, Loughner's lawyers filed subpoenas for the public health records of twenty-two of Loughner's relatives on his mother's side, making requests as far back as

1. *United States v. Loughner*, 672 F.3d 731, 735 (9th Cir. 2012); Lane DeGregory, *Glock 19: Quick, Light, Tough*, ST. PETERSBURG TIMES, Jan. 14, 2011, at B1. Two months after the shootings a federal grand jury indicted Loughner for a number of criminal offenses, including the murder of U.S. District Judge John Roll and the attempted assassination of U.S. Representative Gabrielle Giffords. *Id.*; see also Complaint, *United States v. Loughner*, No. 11-0035M (D. Ariz. Jan. 9, 2011), available at <http://documents.nytimes.com/criminal-complaint-against-jared-lee-loughner>. Loughner is represented by, among others, renowned attorney Judy Clarke. *Loughner*, 672 F.3d at 735.

2. Marc Lacey, *Lawyers for Defendant in Giffords Shooting Seem to Be Searching for Illness*, N.Y. TIMES, Aug. 17, 2011, at A13; Dan Nowicki, *Why Tucson Shooting Struck Heart of Nation*, ARIZ. REPUBLIC, Jan. 25, 2011, at A1; Benjamin Weiser, *Legal Strategy Could Hinge on Mental Ills*, N.Y. TIMES, Jan. 12, 2011, at A1.

3. Lacey, *supra* note 2; Weiser, *supra* note 2. According to death penalty expert David Bruck, who has worked with Judy Clarke, Loughner's defense "is likely to begin a far-ranging investigation of [Loughner's] life and family history, going back several generations to learn as much as possible about his origins, the environment in which he grew up and how he has functioned in society." Weiser, *supra* note 2. Updates concerning the defense strategy indicate that Loughner's attorneys are examining indications of mental illness among many of Loughner's ancestors. Lacey, *supra* note 2.

1893, the year Loughner's maternal great-grandmother was born.⁴ Presumably, if Loughner's relatives revealed serious mental and behavioral disorders over the course of a century, such a legacy, along with a distressed environment, could help explain Loughner's violent propensities and the need to mitigate his punishment.⁵

Defense efforts to examine behavioral genetics evidence in criminal cases are not new, of course. They can be effective but prone to sensationalism.⁶ Recent news articles, for example, have greatly embellished the defense tactics in the trial and sentencing of murderer Bradley Waldroup, given Waldroup's specific genetic make-up or "warrior gene,"⁷ as the media (but no scientist) has dubbed it.⁸ In 2006, Waldroup brutally killed his wife's friend and attempted to kill his wife during what the State characterized as Waldroup's intentional and premeditated actions spurred by a domestic dispute.⁹ In the end, Waldroup shot his wife's friend eight times and slit open her head, then moved on to attack his wife repeatedly with a machete.¹⁰ Waldroup's defense counsel requested that forensic psychiatrist William Bernet assess Waldroup, only for Bernet to discover that Waldroup possessed a particular variant of a very rare deficiency of monoamine oxi-

4. Lacey, *supra* note 2; Katie Moisse, *Jared Loughner's Defense Team May Be Looking for Mental Illness in His Relatives*, ABC NEWS, Aug. 19, 2011, <http://abcnews.go.com/Health/MindMoodNews/jared-loughner-mental-illness-runs-amilies/story?id=14332522#.T6qKaVLpeM0>. It is unclear whether Loughner's lawyers were investigating his father's lineage as thoroughly. Lacey, *supra* note 2.

5. Lacey, *supra* note 2 (According to Professor Christopher Slobogin, "'If the defense can show that mental illness runs in the family, they have a stronger case, one that is more convincing to the jury.'"). Discussions of an interdisciplinary subject of this sort require clear terminology, especially because of the close ties between biological and social factors and the frequent muddling of the terms "biological" and "genetic." In general, *social variables*, such as socioeconomic status, consist of environmental influences on a person's behavior. Jasmine A. Tehrani & Sarnoff A. Mednick, *Crime Causation: Biological Theories*, in 1 ENCYCLOPEDIA OF CRIME & JUSTICE 292, 292 (Joshua Dressler et al. eds., 2d ed. 2002). *Biological variables*, on the other hand, constitute "physiological, biochemical, neurological, and genetic" effects on how an individual may act. *Id.* *Genetic factors* are a subset of biological variables, distinguishable because they are inherited; in contrast, *social factors* are not inherited. *Id.* All these categories—social, biological, and genetic—are, of course, inter-related, as this Article emphasizes.

6. See *infra* notes 7-17, 82-108 and accompanying text.

7. Barbara Bradley Hagerty, *Can Your Genes Make You Murder?*, NAT'L PUB. RADIO, July 1, 2010, <http://www.npr.org/templates/story/story.php?storyId=128043329>.

8. According to William Bernet, M.D., who evaluated Bradley Waldroup, "The term 'warrior gene' is media hype. I am not aware of any scientist or forensic expert using that term." E-mail from William Bernet, M.D., Professor, Department of Psychiatry, Vanderbilt University School of Medicine, to author (Mar. 25, 2012, 12:52 EST) (on file with author) [hereinafter Bernet E-mail].

9. State v. Waldroup, No. E2010-01906-CCA-R3-CD, 2011 WL 5051677, at *1-3 (Tenn. Crim. App. Apr. 2, 2012); Hagerty, *supra* note 7.

10. *Waldroup*, 2011 WL 5051677, at *1-3; Hagerty, *supra* note 7.

dase A (MAOA).¹¹ According to Bernet, this deficiency, when added to Waldroup's history of severe child abuse, "created a vulnerability that [Waldroup] would be a violent adult."¹² Evidence of this gene-environment combination in Waldroup's background also proved pivotal to jurors declining to sentence Waldroup to death.¹³ As one juror characterized some of the jury's deliberations, "There was more to [Waldroup's] whole life that led to that moment [of killing]."¹⁴ When asked if her assessment took into account Waldroup's genetics, she responded, "Oh I'm sure . . . And his background—nature vs. nurture."¹⁵

Press accounts of the Waldroup case, however, provided the public with little more than a dramatized narrative of Waldroup's mitigating evidence. Writing about Waldroup, articles ran with a range of unfortunate headlines: "Can Your Genes Make You Murder?"¹⁶ or "Pity the Poor Murderer, His Genes Made Him Do It."¹⁷ These depictions propelled the view that behavioral genetics evidence can get a defendant "off the hook" entirely for a crime; yet, the reality is that such evidence is mostly offered to mitigate punishment once a defendant's guilt has been established. The distinction is important. There are vast differences in the way evidence is used between these two phases of a case.¹⁸ The press also fostered a level of cause-and-effect between genetics and behavior that Waldroup's attorneys simply never argued, twisting the media's glint nearly exclusively on Waldroup's genetics.

Not surprisingly, scientific advances and rising acceptance of genetics research have fueled a focus on the use of behavioral genetics evidence in criminal trials and death penalty cases.¹⁹ At the same time, accurate ac-

11. Hagerty, *supra* note 7. For a discussion of MAOA and other genes of interest to researchers studying psychopathy see Tracy D. Gunter et al., *Behavioral Genetics in the Antisocial Spectrum Disorders and Psychopathy: A Review of the Recent Literature*, 28 BEHAV. SCI. L. 148 (2010).

12. Hagerty, *supra* note 7.

13. *Id.* After deliberating only eleven hours, the jury convicted Waldroup of aggravated kidnapping, especially aggravated kidnapping, voluntary manslaughter, and attempted second-degree murder. *Waldroup*, 2011 WL 5051677, at *1; Hagerty, *supra* note 7. The trial court sentenced Waldroup "to an effective sentence of thirty-two years" and the Court of Criminal Appeals of Tennessee affirmed. *Waldroup*, 2011 WL 5051677, at *1.

14. Hagerty, *supra* note 7.

15. *Id.*

16. *See id.*

17. Nigel Barber, *Pity the Poor Murderer, His Genes Made Him Do It*, PSYCHOL. TODAY, July 13, 2010, <http://www.psychologytoday.com/blog/the-human-beast/201007/pity-the-poor-murderer-his-genes-made-him-do-it>.

18. *See infra* Subsection I.A.

19. *See* Deborah W. Denno, *Behavioral Genetics Evidence in Criminal Cases: 1994-2007*, in THE IMPACT OF BEHAVIORAL SCIENCES ON CRIMINAL LAW 317-54, 465-98 (Nita A. Farahany ed., 2009), available at <http://ssrn.com/author=13413> [hereinafter *Behavioral Genetics Evidence*]; Kevin M. Beaver, *Genetic Influences on Being Processed Through*

counts are lacking and questions remain on how courts view such evidence and how attorneys select and apply it in litigation. This Article addresses those questions.

The following pages provide a unique study of all criminal cases (totaling thirty-three) that addressed behavioral genetics evidence from June 1, 2007, to July 1, 2011.²⁰ The Study builds upon this Author's prior research on all criminal cases (totaling forty-eight) that used such evidence during the preceding thirteen years (1994-2007).²¹ This combined collection of eighty-one criminal cases employing behavioral genetics evidence offers a rich context for determining how the criminal justice system has handled genetics factors over nearly two decades, but also explains why the last four years reveal particularly important trends.

In general, behavioral genetics researchers study both genetic and environmental sources of variation in human behavioral traits (for example, mental illness and risk taking) in an effort to measure the inheritance of particular characteristics.²² Therefore, the field of behavioral genetics is broadly interdisciplinary, incorporating findings from genetics, biology, psychology, sociology, and statistics, as well as other disciplines.²³ While genes influence behavior, they do not govern nor determine it.²⁴ Rather, "genes play a vital role in the body's development and physiology, and it is through the body, acting in response to and upon surrounding environments,

the Criminal Justice System: Results from a Sample of Adoptees, 69 *BIOLOGICAL PSYCHIATRY* 282, 282-87 (2011); Patricia Cohen, *Genetic Basis for Crime: A New Look*, *N.Y. TIMES*, June 20, 2011, at C1.

20. See *infra* App. (listing and describing each of the thirty-three cases).

21. See *Behavioral Genetics Evidence*, *supra* note 19, at 465-98.

22. See generally ROBERT PLOMIN ET AL., *BEHAVIORAL GENETICS* 305-33 (5th ed. 2008); Michael Rutter, *Gene-Environmental Interplay: Scientific Issues and Challenges*, in *GENE-ENVIRONMENT INTERACTIONS IN DEVELOPMENTAL PSYCHOPATHOLOGY* 3, 3-17 (Kenneth A. Dodge & Michael Rutter eds., 2011); Kevin M. Beaver, *Environmental Moderators of Genetic Influences on Adolescent Delinquent Involvement and Victimization*, 26 *J. ADOLESCENT RES.* 84 (2011); Serena Bezdjian et al., *Psychopathic Personality in Children: Genetic and Environmental Contributions*, 41 *PSYCHOL. MED.* 589 (2011); Avshalom Caspi et al., *Role of Genotype in the Cycle of Violence in Maltreated Children*, 297 *SCIENCE* 851 (2002); Ian W. Craig, *The Importance of Stress and Genetic Variation in Human Aggression*, 29 *BIOESSAYS* 227 (2007); Terrie Moffitt, *The New Look of Genetics in Developmental Psychopathology: Gene-Environment Interplay in Antisocial Behaviors*, 131 *PSYCHOL. BULL.* 533 (2005); Joseph McInerney, *What Is Behavioral Genetics?*, *HUMAN GENOME PROJECT INFORMATION* (last modified Sept. 16, 2008), <http://www.ornl.gov/sci/techresources/HumanGenome/elsi/behavior.shtml>.

23. For a broad overview of these kinds of interdisciplinary relationships see GREGORY CAREY, *HUMAN GENETICS FOR THE SOCIAL SCIENCES* (2003); PLOMIN ET AL., *supra* note 22; Tehrani & Mednick, *supra* note 5.

24. Matt McGue, *The End of Behavioral Genetics?*, 40 *BEHAV. GENETICS* 284, 288 (2010).

that behavior manifests itself.”²⁵ Behavioral genetics evidence includes, but is not limited to, the study of the defendant’s family history as well as direct testing of the defendant’s physiological makeup by way of brain scans, for example.²⁶ Both approaches are informative for explaining why a defendant engaged in criminally violent behavior. As one expert explained in the context of the Loughner case, for example, “Short of a brain scan that shows mental defect, a family history of mental illness is the most persuasive evidence that someone had significant mental problems at the time of the crime.”²⁷

For decades, the concept of ties between genetics and crime has been haunted with controversy.²⁸ As late as 1992, for example, the National Institutes of Health gained worldwide press for defunding a conference on genetics and crime due to claims that a genes-crime link stood for racism and eugenics.²⁹ As one behavioral scientist recently exclaimed, for the past three or four decades “most criminologists couldn’t say the word “genetics” without spitting.”³⁰ Yet presently, at least one hundred studies indicate a tie between genetics and criminality, and criminologists are slowly being encouraged to examine the association further in light of other research on behavioral problems (such as alcoholism and mental illness) that demonstrate some kind of genetic foundation.³¹

Most of these researchers are also quick to clarify their view on how genes and criminality intertwine. They debunk, for example, a wrong—but common—stereotype that an individual’s “genotype” or “genetic constitution”³² is static, as though there is a “crime gene” that “hardwires” certain people to violate the law.³³ This perspective, however entrenched in the public’s mind, has no scientific support. Rather, an overwhelming amount of

25. CATHERINE BAKER, BEHAVIORAL GENETICS viii (2004), available at <http://www.aaas.org/spp/bgenes/Intro.pdf> (report prepared for a project conducted by the American Association for the Advancement of Science and The Hastings Center).

26. See *infra* Subsection II.B.

27. Lacey, *supra* note 2 (quoting Professor Christopher Slobogin).

28. See *Behavioral Genetics Evidence*, *supra* note 19, at 317-24; see also Deborah W. Denno, *Revisiting the Legal Link Between Genetics and Crime*, 69 LAW & CONTEMP. PROBS. 209 (2006) [hereinafter *Revisiting the Legal Link*]; Deborah W. Denno, *The Legal Implications of Genetics and Crime Research*, in GENETICS OF CRIMINAL AND ANTISOCIAL BEHAVIOUR 248 (Gregory Bock & Jamie Goode eds., 1996) (Ciba Foundation Symposium 194), available at <http://ssrn.com/author=13413> [hereinafter *Legal Implications*]. For an intriguing discussion of eugenics in the context of debates about capital punishment see Carol S. Steiker & Jordan M. Steiker, *Capital Punishment: A Century of Discontinuous Debate*, 101 J. CRIM. L. & CRIMINOLOGY 643 (2010).

29. See *infra* note 108 and accompanying text.

30. Cohen, *supra* note 19.

31. *Id.*

32. CAREY, *supra* note 23, at 68.

33. See *Behavioral Genetics Evidence*, *supra* note 19, at 323-24.

evidence shows that genes are controlled by the environment and can either enhance or heighten the likelihood of a certain behavior, such as criminality, based on the surrounding circumstances.³⁴ Thus, an individual's genetic structure may act developmentally in the context of social variables by potentially predisposing an individual to behavioral tendencies, such as aggression, which may or may not result in law-breaking.³⁵ For example, many people may share a genetic proclivity for aggression, but some may never act out their impulses in any physical way while others may become violent career criminals.³⁶ This tight association between genetics and environment explains why Loughner's attorneys would also look carefully at his immediate family, home, school, and peer relationships in addition to any genetic factors (such as mental illness) in order to better assess why he engaged in such violence.³⁷

Part I of this Article introduces the use of behavioral genetics evidence in criminal cases by comparing two earlier cases involving two substantially different defendants—Stephen Mobley (whose evidence was rejected) and Susan Smith (whose evidence was accepted). For example, much of the controversy surrounding Mobley's case stemmed from the assumption that attorneys would abuse behavioral genetics evidence to support their positions and that courts would countenance the distortions.³⁸ This Article concludes that such predictions are, with rare exceptions, unfounded.

Part II discusses the thirty-three behavioral genetics and crime cases that this Author studied between June 1, 2007, and July 1, 2011.³⁹ These cases share two important characteristics. First, they all constitute murder convictions in which (with one exception) defendants attempted to use behavioral genetics evidence as a mitigating factor in a death penalty case (as Stephen Mobley and Susan Smith did). Second, the behavioral genetics evidence is introduced mostly to verify a condition (such as a type of mental illness) that is commonly acceptable for mitigation.⁴⁰ Thus, the question now is not whether courts will accept behavioral genetics factors (they overwhelmingly do), but rather what role those factors will play in particu-

34. CAREY, *supra* note 23, at 452.

35. See *Behavioral Genetics Evidence*, *supra* note 19, at 323-24; see also Terrie E. Moffitt, *Genetic and Environmental Influences on Antisocial Behaviors: Evidence from Behavioral-Genetic Research*, in 55 *ADVANCES IN GENETICS* 41, 41-104 (Jeffrey C. Hall ed., 2005) (analyzing the interaction between genes and the environment with respect to antisocial behavior).

36. For an excellent example of how criminologists focus on the myriad criminal pathways that offenders follow over their lifetimes see JOHN H. LAUB & ROBERT J. SAMPSON, *SHARED BEGINNINGS, DIVERGENT LIVES: DELINQUENT BOYS TO AGE 70* (2003).

37. Moisse, *supra* note 4.

38. *Turpin v. Mobley*, 502 S.E.2d 458, 461 (Ga. 1998); see also *infra* notes 82-110 and accompanying text (discussing the Mobley case).

39. See *infra* Part II.

40. See *infra* Part II.

lar cases in the context of mitigation evidence. According to this Author's Study, for example, there was no case in which behavioral genetics factors were introduced by the State, much less used as aggravating evidence or indications that a defendant would be a future danger to others. Compared to prior cases, attorneys are more likely to submit such evidence to demonstrate a defendant's inheritance of substance or alcohol abuse. These results challenge arguments that such evidence will be legally detrimental to a defendant. Indeed, this Study's results indicate that, at the very least, behavioral genetics evidence has no decipherable impact on a defendant's case or, at most, it becomes an effective tool along with a range of other kinds of variables in rendering a defendant ineligible for the death penalty. Courts also appear willing to accept behavioral genetics evidence as part of a defendant's mitigation story, even if genetics renders that story a more troubling one in terms of the defendant's purported propensities.

Part III compares this Study of thirty-three cases to the Author's prior study of forty-eight cases in order to examine whether courts have changed their use of behavioral genetics evidence in the last four years relative to the preceding thirteen years.⁴¹ Overall, courts today appear far less skeptical about accepting behavioral genetics evidence, and they do so in the majority of cases in which defense attorneys attempt to offer it. In contrast to past years when courts often questioned the applicability or relevance of such information, recent findings indicate that their focus has turned to whether the evidence, when used with other factors in mitigation, can outweigh the aggravating factors that support a death sentence.

It remains to be seen whether or how such trends will be affected by *Cullen v. Pinholster*,⁴² the United States Supreme Court's recent decision restricting prisoners' efforts to seek federal habeas relief under the Antiterrorism and Effective Death Penalty Act of 1996 (AEDPA).⁴³ Two of the cases in this Article's Study have already been impacted by *Pinholster*.⁴⁴ Regardless, behavioral genetics evidence seems, on the surface, to have reached a status commensurate with other kinds of evidence without the baggage of abuse with which it has typically been associated.

This Article has a number of caveats, of course, particularly given the subject matter. Because nearly all of the eighty-one cases in this Author's studies involve death sentences, comparisons across time can be a challenge. Litigation and appeals can go on for many years, and outcomes may

41. See *infra* Part III.

42. 131 S. Ct. 1388 (2011).

43. Pub. L. No. 104-132, 110 Stat 1214 (codified as amended in scattered sections of the U.S. Code).

44. See *infra* notes 463-64 and accompanying text.

be continually shifting,⁴⁵ hence the potential effect of *Pinholster*. Any assessment of trends, therefore, must be taken in context because it may reflect in part outcomes in cases originating in different years or even decades. Nonetheless, clear changes within this Article's sample are evident, and the focus is on those that are real rather than potentially random.

This Article acknowledges another concern. Cases involving behavioral genetics evidence incorporate many other variables about the defendant—biological, sociological, and environmental—in addition to the nature of the crime and the defendant's criminal history. The jury's weighing of these aggravating and mitigating factors in a death penalty case is an intricate process. Therefore, this Study's results do not purport to suggest that the inclusion of behavioral genetics evidence was the sole cause of any particular case outcome; this kind of causal mechanism is as impossible to isolate or measure for behavioral genetics evidence as it would be for any other kind of variable. That said, this Study's case comparisons can help steer conclusions in one direction or another about whether behavioral genetics evidence can make a contribution, irrespective of other potential influences.

Overall, most courts seem to focus on screened and scientifically acceptable studies or information on behavioral genetics. Their primary emphasis also concerns how a defendant's genetic makeup *and* environment might bear on that defendant's punishment. Within the next decade or so, as this interactive gene-environment research becomes even more scientifically sound, courts will find it ever more useful.⁴⁶ After all, as the following pages demonstrate, a gene is not *just* a gene. It is only one part of a defendant's story.

I. HOW DOES THE GENE-ENVIRONMENT INTERACTION WORK?

Behavioral geneticists generally classify the link between genetics and the environment in three primary ways.⁴⁷ "*Passive gene-environment correlation*" occurs when parents, the source of their children's genes, are also one key source for the content of their children's environment.⁴⁸ For example, parents of superior intellect may transmit to their children not only strong cognitive capabilities, but also mentally stimulating surroundings. "*Evocative gene-environment correlation*" exists when individuals with different genotypes evoke different responses from people and therefore

45. For example, this Article's Study of thirty-three cases included three cases from the Author's prior study of forty-eight cases because the three cases were involved in ongoing litigation that affected the acceptance of behavioral genetics evidence. *See infra* App.

46. *See* Bernet E-mail, *supra* note 8 ("I would predict that in 10-15 years, behavioral genomics will be on much more solid ground and will be of great practical value in both civil and criminal trials.")

47. McGue, *supra* note 24, at 288.

48. *Id.*

change their environment.⁴⁹ Thus, a cooperative child may elicit substantially different reactions from parents and teachers than an aggressive child in part because of the differences in how the two children behave. “[A]ctive gene-environment correlation” arises when individuals seek experiences consistent with their genetically transmitted abilities and behaviors so that they can create a complementary environment.⁵⁰ Thrill-seekers, for example, may select jobs or hobbies that reinforce their inherited proclivities, such as parachuting, mountain climbing, etc.⁵¹

Substantial research also shows that as individuals develop from childhood to adulthood, genetic influences on their behavior strengthen while shared environmental factors wane.⁵² This pronounced impact of genetic makeup is unsurprising given that individuals acquire greater control over their choices and surroundings as they become more independent from their parents and families.⁵³ In essence, then, aging is accompanied by increases in active gene-environmental correlational processes and decreases in passive gene-environmental correlational processes.⁵⁴

In criminal cases, evidence concerning behavioral genetics covers all three types of gene-environment classifications. It includes, for example, the study of a defendant’s physiological makeup as well as family history for potential associations with a range of disorders including violence, mental illness, depression, mental retardation, alcoholism, and substance abuse. The presence of such disorders in a defendant’s family can indicate that they were genetically transmitted to the defendant.

A. Balancing Aggravating and Mitigating Factors

In a capital case, behavioral genetics evidence can be used in one of two ways: first, during the guilt-or-innocence phase in which the State must prove a defendant committed an alleged crime beyond a reasonable doubt; and/or second, during the penalty phase when the jury has found the defendant guilty of the capital crime and then hears evidence of aggravation from the State and mitigation from the defense when determining whether a defendant should be sentenced to death.⁵⁵ There is a critical distinction be-

49. *Id.*

50. *Id.*

51. *Id.*

52. *Id.*

53. See Sandra Scarr & Kathleen McCarney, *How People Make Their Own Environments: A Theory of Genotype>Environmental Effects*, 54 CHILD DEV. 424, 424–34 (1983).

54. McGue, *supra* note 24, at 288.

55. John H. Blume & Emily C. Paavola, *Life, Death, and Neuroimaging: The Advantages and Disadvantages of the Defense’s Use of Neuroimages in Capital Cases—Lessons from the Front*, 62 MERCER L. REV. 909, 914 (2011).

tween the ways evidence is used in these two phases. The guilt-or-innocence phase involves a factual determination of whether a defendant committed the crime. In contrast, the penalty phase concerns “the moral and normative choice” of whether a defendant “deserve[s] to die.”⁵⁶ In order to ensure consistency in comparing cases, this Article focuses on the use of behavioral genetics evidence during the penalty phase irrespective of whether some cases also raised such evidence during the guilt-or-innocence phase. The penalty phase of a capital case is typically far better documented than the guilt-or-innocence phase, which may have occurred years before and may not have been fully explicated either in a court case or some other accessible format.⁵⁷

It is within this death penalty context that most of the cases analyzed in the Author’s Study also raised ineffective assistance of counsel claims.⁵⁸ In order to assess the validity of these kinds of challenges, the Supreme Court in *Strickland v. Washington*⁵⁹ established a two-pronged test: first, counsel’s performance must actually be “deficient,” and second, this deficient performance must have “prejudiced” the defendant.⁶⁰ Of course this *Strickland* test and its interpretations are far more intricate than what is presented here for the purpose of establishing basic guidelines.

In addition to rules attempting to ensure the quality of a defendant’s representation, the great majority of death penalty states require that a fact-finder consider and weigh both aggravating and mitigating circumstances in the case. This balancing is important. In most jurisdictions, aggravating circumstances must outweigh mitigating circumstances for a defendant to be sentenced to death.⁶¹ However, the Supreme Court has also upheld a Kansas death penalty statute that allowed jurors to impose the death penalty when aggravating circumstances were not required to outweigh mitigating circumstances, including when aggravating and mitigating circumstances were equally distributed.⁶² Regardless, if a defendant challenges a death sentence,

56. *Id.* at 915 (citation omitted).

57. This Author did attempt to trace back over numerous, at times unpublished or unavailable, proceedings and trials to determine when and how behavioral genetics evidence was first used in the thirty-three cases under study. However, legal databases simply do not begin to make accessible every record at issue in a case. Given the hit-or-miss and at times speculative nature of the venture, it appeared that any picture pieced together could be unreliable or misleading.

58. See *infra* Chart 2; note 190 and accompanying text.

59. 466 U.S. 668 (1984).

60. *Id.* at 687.

61. For discussions of these factors and how they interplay see James R. Acker & Charles S. Lanier, *Matters of Life or Death: The Sentencing Provisions in Capital Punishment Statutes*, 31 CRIM. L. BULL. 19, 33-52 (1995); O. Carter Snead, *Memory and Punishment*, 64 VAND. L. REV. 1195, 1248-52 (2011).

62. See *Kansas v. Marsh*, 548 U.S. 163, 173, 181 (2006).

a reviewing court must reweigh the aggravating evidence against the totality of available mitigating evidence.⁶³

Under *Strickland*, an ineffective assistance of counsel claim has merit only if “counsel’s conduct so undermined the proper functioning of the adversarial process that the trial [including the sentencing phase] cannot be relied on as having produced a just result.”⁶⁴ To succeed on such a claim, the defendant must show that his trial counsel’s conduct was unreasonable under the circumstances and resulted in prejudice against him.⁶⁵ The sentence will be disturbed only if a reviewing court finds a “reasonable probability” that, absent counsel’s errors, the verdict or sentence would have been different.⁶⁶ A court must therefore determine whether there is a reasonable probability that if trial counsel had presented the omitted mitigating evidence, the fact-finder would have concluded that the balance of aggravating and mitigating circumstances did not warrant the death penalty.⁶⁷

Mitigating evidence usually includes information about a capital defendant’s background and life prior to his crime.⁶⁸ In contrast, the prosecution’s presentation of aggravating evidence includes those circumstances surrounding a crime and a defendant’s prior criminal record.⁶⁹ Death penalty jurisdictions vary with respect to the types of aggravating and mitigating circumstances they enable a fact-finder to consider. Common statutory aggravating factors include the following: commission of an offense in an “[e]specially heinous, cruel or depraved manner,” “[u]se, threatened use or possession of a deadly weapon,” or commission of an offense expecting to receive something of “pecuniary value.”⁷⁰ Statutory mitigating factors can include the “age of the defendant” or the “defendant’s capacity to appreciate the wrongfulness of the defendant’s conduct.”⁷¹ According to the Supreme Court, defendants can also present mitigating evidence relevant to “any aspect of [the] defendant’s character or record and any of the circumstances of the offense that the defendant proffers as a basis for a sentence less than death.”⁷² This is a highly open-ended standard that allows a defendant to

63. *Wiggins v. Smith*, 539 U.S. 510, 534 (2003).

64. *Strickland*, 466 U.S. at 686.

65. *Id.* at 694.

66. *Id.*

67. *Malone v. State*, 168 P.3d 185, 229 (Okla. 2007).

68. *Id.* at 223. For a recent perspective on the use of mitigation evidence see Jeffrey Toobin, *The Mitigator: A New Way of Looking at the Death Penalty*, NEW YORKER, May 9, 2011, at 32.

69. *Malone*, 168 P.3d at 229.

70. ARIZ. REV. STAT. § 13-701(D) (2011) (listing Arizona’s aggravating factors).

71. ARIZ. REV. STAT. § 13-701(E) (2011) (listing Arizona’s mitigating factors).

72. *Kansas v. Marsh*, 548 U.S. 163, 174 (2006) (quoting *Lockett v. Ohio*, 438 U.S. 586, 604 (1978)); see also *id.* at 172-74 (designating that all death penalty sentencing schemes must “(1) rationally narrow the class of death-eligible defendants; and (2) permit a

introduce a full range of factors. Guidelines for how to weigh or balance these factors are similarly flexible. In an effort to structure what could be a substantial amount of information—including many different types of scientific tests and theories—attorneys often attempt to combine it all into a compelling “story.”⁷³

B. Mitigation Stories

A defendant’s “mitigation story”⁷⁴ can be critical to determining whether a defendant will be executed. Mitigating factors are far-reaching and subjective; they can prompt jurors to feel empathy and connection with a defendant who jurors have just convicted of committing horrendous acts.⁷⁵ The evidence can also profile and detail a defendant’s damaged and disabled brain so that jurors can comprehend how distorted a defendant’s thought processes may have been throughout that defendant’s life, including the seconds immediately preceding the defendant’s crime.⁷⁶ Statutory and non-statutory mitigating factors can likewise pertain to circumstances at the scene of the crime, for example, if “the defendant was under unusual or substantial duress.”⁷⁷ The purpose of expert testimony, if it is offered, can further assist jurors in experiencing the defendant’s particular worldview.⁷⁸ In essence, mitigation—as well as the Court’s “any aspect of the defendant’s character or record”⁷⁹ standard—can present the defendant’s biography in a way that can attempt to tip the scale toward life rather than death.⁸⁰ Such guidelines are also remarkably flexible. The trial judge in Jeffrey Landrigan’s sentencing hearing, for example, concluded that one of the two non-statutory mitigating circumstances operating on Landrigan’s behalf was “that Landrigan’s family loved him,”⁸¹ evidence that would be irrelevant for Landrigan as a defense against a murder conviction.

jury to render a reasoned, individualized sentencing determination based on a death-eligible defendant’s record, personal characteristics, and the circumstances of his crime”).

73. For an example of how such a story can be told in the death penalty context see Deborah W. Denno, *Who is Andrea Yates? A Short Story About Insanity*, 10 DUKE J. GENDER L. & POL’Y 1 (2003).

74. Blume & Paavola, *supra* note 55, at 914.

75. *Id.* at 915.

76. *Id.* at 915-16.

77. ARIZ. REV. STAT. § 13-701(E) (2011) (listing Arizona’s mitigating factors).

78. Blume & Paavola, *supra* note 55, at 915.

79. *Kansas v. Marsh*, 548 U.S. 163, 174 (2006) (quoting *Lockett v. Ohio*, 438 U.S. 586, 604 (1978)).

80. Blume & Paavola, *supra* note 55, at 916. For a thorough discussion of the meaning of mitigation see Russell Stetler, *The Mystery of Mitigation: What Jurors Need to Make a Reasoned Moral Response in Capital Sentencing*, 11 U. PA. J.L. & SOC. CHANGE 237 (2008).

81. *Schriro v. Landrigan*, 550 U.S. 465, 470 (2007).

Such elasticity enables defendants to submit as mitigation behavioral genetics evidence that goes back generations. Regardless, over the years, some courts have viewed behavioral genetics factors skeptically, even when deciding capital cases. One example of this attitude is the 1994 appeal of Stephen Mobley, a watershed moment in the modern use of behavioral genetics evidence and a comparison case for this Article's Study. Indeed, *Mobley* marks the start of this Author's seventeen-year analysis of the application of such evidence in criminal cases; the case's facts and defense strategy seemed to strike a modern nerve, both socially and legally. Mobley's mitigation story is also complex.

1. *The Stephen Mobley Story*

Mobley's 1991 crime—the attempted robbery of a Domino's Pizza store that ended with the needless murder of the store's manager⁸²—prompted particular challenges for his court-appointed attorneys.⁸³ Mobley's "numerous" confessions and the dearth of "traditional mitigation evidence" did not make for a sympathetic story.⁸⁴ As a white adult of twenty-five years, Mobley was economically privileged,⁸⁵ had no history of physical or sexual abuse,⁸⁶ and also demonstrated an early and continuous history of severe personal and behavioral disorders that were pronounced even when he was awaiting trial.⁸⁷ Prospects for any defense appeared slight. Yet, in the course of analyzing Mobley's family, a relative testified that four generations of Mobleys—including Mobley's uncles, aunts, and a grandfather—engaged in acts of violence, aggression, and behavioral disorder.⁸⁸

82. *Mobley v. State*, 426 S.E.2d 150, 151 (Ga. 1993); *Mobley v. State*, 455 S.E.2d 61, 65 (Ga. 1995); *Turpin v. Mobley*, 502 S.E.2d 458, 461 (Ga. 1998); *Behavioral Genetics Evidence*, *supra* note 19, at 325.

83. *Turpin*, 502 S.E.2d at 463; *Behavioral Genetics Evidence*, *supra* note 19, at 325-26.

84. *Turpin*, 502 S.E.2d at 463-64 (citations omitted); Daniel A. Summer, *The Use of Human Genome Research in Criminal Defense and Mitigation of Punishment*, in *GENETICS AND CRIMINALITY: THE POTENTIAL MISUSE OF SCIENTIFIC INFORMATION IN COURT* 182, 189 (Jeffrey R. Botkin et al. eds., 1999); *see also Turpin*, 502 S.E.2d at 463-66 (recognizing the lack of available mitigating evidence in Mobley's background).

85. *Turpin*, 502 S.E.2d at 463-64.

86. *Id.* at 463.

87. These behaviors ranged from lying and theft as a youth to more serious offenses in adolescence, resulting in prison sentences for forgery and culminating in numerous armed robberies during Mobley's mid-twenties and up to the point of the Domino's Pizza murder. Summer, *supra* note 84, at 189. While awaiting trial for that murder, Mobley's aggression was out of control: he fought continually with other inmates, sodomized his cellmate, tattooed the word "Domino" on his own back, and verbally taunted and threatened prison guards. *Id.*; *see also Turpin*, 502 S.E.2d at 463-64; *Legal Implications*, *supra* note 28, at 251-52.

88. *Turpin*, 502 S.E.2d at 465.

Such behavior ranged from serious crimes (murder and rape) to extreme spousal abuse, alcoholism, explosive temperaments, and antisocial conduct.⁸⁹

In order to further probe this lead, Mobley's attorneys made two moves. First, they requested experts and financial support so that scientific tests could be conducted to determine if Mobley showed any kind of genetic or neurochemical imbalance.⁹⁰ Second, they introduced into evidence a then-recent article published in the prestigious journal *Science*,⁹¹ reporting the results of genetic testing of a Dutch kindred of four generations.⁹² The kindred comprised a number of males affected by a syndrome characterized by borderline mental retardation and serious behavioral dysfunction such as impulsivity, verbal and physical aggression, and violence.⁹³ The acts of violence included rape, sexual abuse, attempted murder, and arson.⁹⁴ Tests on these males showed evidence of MAOA deficiency, which was passed from mother to son and linked to regulating aggression.⁹⁵

Mobley's attorneys wanted to investigate whether Mobley was also afflicted by the MAOA deficiency or by a comparable kind of disability because it was likely that Mobley had inherited a propensity for criminality. In their mind, the trial court should have enabled Mobley to be so tested.⁹⁶ Certainly such testing was allowed in the Bradley Waldroup case that would arise over a decade later.⁹⁷ Yet, the Georgia Supreme Court rejected that reasoning and affirmed the trial court's holding, relying on the lack of a

89. *Id.*; *Legal Implications*, *supra* note 28, at 251 & fig.1.

90. *Legal Implications*, *supra* note 28, at 252; Summer, *supra* note 84, at 189.

91. H.G. Brunner et al., *Abnormal Behavior Associated with a Point Mutation in the Structural Gene for Monoamine Oxidase A*, 262 *SCIENCE* 578 (1993) [hereinafter Brunner et al., *Abnormal Behavior*]; see also Paul S. Appelbaum, *Behavioral Genetics and the Punishment of Crime*, 56 *PSYCHIATRIC SERVICES* 25, 25 (2005) (discussing the Brunner et al. study). For a general overview of the research see Han G. Brunner, *MAOA Deficiency and Abnormal Behaviour: Perspectives on an Association*, in *GENETICS OF CRIMINAL AND ANTISOCIAL BEHAVIOUR* 155, 155-67 (Gregory Bock & Jamie Goode eds., 1996) (Ciba Foundation Symposium 194) [hereinafter Brunner, *MAOA Deficiency*]. For details on the studies see Brunner et al., *Abnormal Behavior*, *supra*; H.G. Brunner et al., *X-Linked Borderline Mental Retardation with Prominent Behavioral Disturbance: Phenotype, Genetic Localization, and Evidence for Disturbed Monoamine Metabolism*, 52 *AM. J. HUM. GENETICS* 1032 (1993) [hereinafter Brunner et al., *X-Linked*].

92. Brunner, *MAOA Deficiency*, *supra* note 91, at 156.

93. *Id.*

94. Brunner et al., *X-Linked*, *supra* note 91, at 1035.

95. Brunner et al., *Abnormal Behavior*, *supra* note 91, at 578-79.

96. See *Legal Implications*, *supra* note 28, at 251-52 (discussing the Mobley case in light of historical and contemporary arguments concerning the use of genetics evidence in criminal law cases); see also *Revisiting the Legal Link*, *supra* note 28, at 212; *Behavioral Genetics Evidence*, *supra* note 19, at 325-30.

97. See *supra* notes 7-17 and accompanying text.

showing of any causal link between Mobley's genetics and his violence.⁹⁸ As the court explained, the genetics theory involved in Mobley's case "will not have reached a scientific stage of verifiable certainty in the near future and . . . Mobley could not show that such a stage will ever be reached."⁹⁹

After further legal wrangling over such "an unorthodox mitigating defense that attempted to show a possible genetic basis for Mobley's conduct,"¹⁰⁰ the Georgia Supreme Court again denied genetic testing for Mobley, but for a somewhat different reason than it had expressed three years earlier.¹⁰¹ In the court's view, Mobley had in fact been "able to present the genetics theory" through a relative's testimony about the family's generations of behavioral problems.¹⁰² Further, even if the court had allowed genetic testing, "there ha[d] been no showing that a geneticist would have offered additional significant evidence."¹⁰³ Ultimately, however, family history evidence alone failed to mitigate in Mobley's case.¹⁰⁴ In 2005, after additional appeals, he was executed.¹⁰⁵

Mobley's request for genetic testing—in addition to other events at the time—invited pervasive national and international debate on the political and scientific acceptability of behavioral genetics evidence of criminality.¹⁰⁶ The debate invoked earlier controversies: the historical association of genetics evidence with the Holocaust, the chilling of free will, the stigmatization of disordered populations, the absolution from social responsibility, and the fear that juries would be unduly swayed by the seemingly more objective and precise nature of genetic studies.¹⁰⁷ These concerns also played into the 1992 conference at the University of Maryland regarding the potential racial bias of such evidence.¹⁰⁸

98. *Mobley v. State*, 455 S.E.2d 61, 66 (Ga. 1995).

99. *Id.*

100. *Turpin v. Mobley*, 502 S.E.2d 458, 463 (Ga. 1998).

101. *Id.* at 463-66.

102. *Id.* at 466.

103. *Id.*

104. See Behavioral Genetics Evidence, *supra* note 19, at 325-30.

105. Mark Davis, *Final Appeals Fail; Killer Mobley Dies*, ATLANTA J. CONST., Mar. 2, 2005, at B3; Mark Davis, *Mobley Dies for 1991 Murder; Supreme Court Denies Last Appeals Half-Hour Before Execution*, ATLANTA J. CONST., Mar. 2, 2005, at 1JJ.

106. See Behavioral Genetics Evidence, *supra* note 19, at 317-20, 325-30; *Legal Implications*, *supra* note 28, at 251-53 (citing articles discussing the controversy surrounding the Mobley case).

107. Behavioral Genetics Evidence, *supra* note 19, at 254.

108. The University of Maryland planned to hold a conference on *The Meaning and Significance of Research on Genetics and Criminal Behavior*. David Wasserman, a legal scholar and organizer of the conference, noted at the time, "There are a hell of a lot of people attending this conference who think the dangers of genetic research are as great in the long term as the dangers of atomic energy." Mike Pezzella, *Violence DNA Researchers Mum on Meeting. Hoping to Avoid Protests*, BIOTECH. NEWSWATCH, Apr. 15, 1996, at 14; Wade Roush, *Conflict Marks Crime Conference*, 269 SCIENCE 1808, 1808 (1995) ("The [Maryland]

After *Mobley*, predictions were also made that attorneys would increasingly attempt to introduce behavioral genetics evidence in criminal cases during the guilt-or-innocence phase or as mitigation during the penalty phase.¹⁰⁹ While such predictions are difficult to measure, this Author's study of cases from 1994-2007 suggested that the strategy grew in use, especially for the defense. Not only were behavioral genetics studies becoming more sophisticated, but so were defense attorneys, especially in their willingness to rely on interdisciplinary research.¹¹⁰ Likewise, the particularly strong reaction against *Mobley's* case seems, in retrospect, an outlier because other cases at the time were also introducing behavioral genetics evidence. The highly publicized case of Susan Smith, for example, appeared to use such evidence far more successfully.

2. *The Susan Smith Story*

Susan Smith's 1995 trial in South Carolina took place one year after *Mobley's* controversial appeal.¹¹¹ Smith was convicted of murdering her two young sons by causing her car to roll into a lake with her sons strapped inside. She ultimately avoided a death sentence seemingly in part because her

conference . . . has been protested, canceled, rescheduled, and otherwise dogged by controversy ever since it was first planned . . ."). Previously, the conference had been cancelled because of the controversial nature of the topic. Carolyn Abraham, *DNA at 50: The First of a 3 Part Series, The Bad Seed*, GLOBE & MAIL (Toronto), Mar. 1, 2003, at F1 ("In 1992, just a year before Mr. Summer seized on the Dutch family study, the U.S. National Institutes of Health cancelled a conference on crime and genetics at the University of Maryland—after black groups protested that such research was racially motivated."); Clive Cookson, *Controversial Search for the Criminal Gene: A Conference the Americans Would not Allow*, FIN. TIMES (U.K.), Feb. 14, 1995, at 8 ("Public pressure forced the US National Institutes of Health to cancel a conference on [genetics and behavior] in 1992 after opponents of the research detected racial overtones in some of the proposed contributions."); Pezzella, *supra* ("Even participants [of the Maryland conference] found the meeting somewhat distasteful. Paul R. Billings, a professor at Stanford University . . . said he feared the current concentration on genetics could bring back the kind of eugenics movement that was espoused by the Nazis."); Richard W. Stevenson, *Researchers See Gene Link To Violence But Are Wary*, N.Y. TIMES, Feb. 19, 1995, at 29 ("[The Maryland] conference was called off after critics said that it was too accepting of the idea that inherited personality traits were the primary causes of crime and violence and that it would promote the notion that criminals could be identified by genetic markers."); Tom Wilkie, *Scientist Denounces Criminal Gene Theory*, INDEPENDENT (London), Feb. 13, 1995, at 2 ("[The Maryland conference] was seen as overtly racist.").

109. *Behavioral Genetics Evidence*, *supra* note 19, at 321.

110. *See infra* Subsection III.C.

111. *See* Transcript of Examination of Dr. Sandra Confradi at *1, SLED Agent L.A. "Pete" Logan, Wanda Palmer, Gail Hollis, Ernest Talley, FBI Special Agent Carol Allison, and Dr. Arlene Andrews, *State v. Smith*, 1995 WL 551104 (S.C. Gen. Sess. July 20, 1995) (Nos. 94-GS-44-906 & 94-GS-44-907) [hereinafter Transcript, Examination of Dr. Sandra Confradi].

defense team introduced mitigating evidence that she had suffered from depression since childhood.¹¹² According to Smith's defense, she was on the verge of committing suicide and taking her two children with her when she changed her mind at the last minute and leaped from the car, all the while watching while the car submerged.¹¹³ Testimony indicated that Smith's state of mind was so distressed at the time that she was not able to think about her drowning children.¹¹⁴

In an effort to support its case, the defense presented expert witness testimony of Smith's family history and upbringing.¹¹⁵ According to defense witness and psychiatrist Seymour Halleck, M.D., there was a high incidence of depression and mental illness in Susan Smith's family.¹¹⁶ Her older brother Michael, her grandmother, and her aunt had all attempted suicide; this pattern indicated that it was likely that Smith herself was genetically predisposed to depression (such high levels of mental illness in the family "increases [a person's] chances threefold" for depression).¹¹⁷ Defense witness and social worker Dr. Arlene Andrews created a "genogram," shown in Figure 1,¹¹⁸ which illustrated the family's history of behavioral disorder¹¹⁹

112. See generally Transcript of Closing Arguments, Jury Instructions, Verdict of the Jury, Sentencing, *State v. Smith*, 1995 WL 789245 (S.C. Gen. Sess. July 28, 1995) (Nos. 94-GS-44-906 & 94-GS-44-907) [hereinafter Transcript, Closing Arguments]; see also GEORGE REKERS, SUSAN SMITH: VICTIM OR MURDERER (1996) (providing an overview of Smith's background, trial, verdict, and sentencing); Melinda E. O'Neil, *The Gender Gap Argument: Exploring the Disparity of Sentencing Women to Death*, 25 NEW ENG. J. CRIM. & CIV. CONFINEMENT 213, 227-33 (1999) (examining the Susan Smith case in the context of gender stereotyping on death row).

113. Transcript, Closing Arguments, *supra* note 112, at *22 (testimony of Seymour Halleck, M.D.) ("And [defense witness] Dr. Halleck concluded after reviewing the whole history, everything that I have just passed over quickly now, that she was in a depressive crisis, in a depressive episode. And in the irrationality of that moment she made the irrational choice of suicide.").

114. *Id.* at *23.

115. See *infra* notes 116-26 and accompanying text.

116. See *infra* notes 117-25 and accompanying text.

117. Transcript of Examination of Phoebe Kay Dillard at *31-32, James William Shaw, Jr., Seymour L. Halleck, Iris Rogers, Amy Gibson & Deborah Green, *State v. Smith*, 1995 WL 578226 (S.C. Gen. Sess. July 21, 1995) (Nos. 94-GS-44-906 & 94-GS-44-907). As Dr. Halleck detailed:

Well, there is a very high incidence of mental illness in the blood members of her family. We call this heavy genetic loading, which really means that there is a very, very high chance that a person with this kind of frequency of illness in the family would get depressed. . . . I think the bottom line in this is that we know that having this kind of family tree increases your chances threefold that she will get depressed.

Id.

118. See *infra* Figure 1. The original genogram presented in court is color-coded to indicate particular disorders. See *infra* note 119. Because Figure 1 in this Article cannot be in color, disorders are indicated by initials, as shown. See *infra* Figure 1.

across three generations. The genogram contained details of each relative who had experienced one or more of a number of serious conditions: depression, a suicide attempt or suicide success (Smith's father), alcohol abuse, mental retardation, or other disability.¹²⁰ In addition to the genetics evidence, testimony revealed that Smith's early childhood upbringing was characterized by family tension and instability due to her parents' separation, followed by her father's suicide when Smith was six years old.¹²¹ Dr. Andrews testified that these events led to the development of Smith's dependent depressive disorder, in which she constantly needed love and attention from those around her and was frequently distraught over losing this emotional support.¹²²

Drawing on this history, the defense brought up Smith's first suicide attempt at age thirteen to demonstrate how Smith's upbringing had affected her mental health.¹²³ During her later teenage years, Smith's stepfather sexually abused her.¹²⁴ Dr. Andrews testified that this trauma further exacerbated Smith's depression, as she was afraid to lose her stepfather, but at the same time felt that she was violating her own moral code.¹²⁵ Smith's second suicide attempt came at the age of eighteen, Dr. Andrews testified, most likely because Smith was afraid of losing the relationships with her forty-

119. The genogram was Defense Exhibit No. 4 prepared by defense witness Dr. Arlene Andrews. A photo of the genogram was taken and sent to the author by William F. Gault, Clerk of Court, Union County, South Carolina. See E-mail from William F. Gault, Clerk of Court, Union County, South Carolina to author (Apr. 18, 2011, 18:26 EST) (on file with author). According to CAMPBELL'S PSYCHIATRIC DICTIONARY, a genogram is a [g]raphic representation of the history and the relationship structure of the family, emphasizing the connection between events and patterns; the genealogy of a family; family tree. In family therapy, the genogram is a means of identifying intergenerational continuities and the ways in which the past determined both the expressed and the unexpressed expectation that family members have of one another. CAMPBELL'S PSYCHIATRIC DICTIONARY 419 (Robert J. Campbell ed., 8th ed. 2004).

120. Transcript, Examination of Dr. Sandra Confradi, *supra* note 111, at *68-70 (noting that Smith's father, mother, and three paternal aunts had suffered from depression, and that her maternal grandmother and brother had attempted suicide).

121. Transcript of Examination of Steve Derrick at *36-39, Scotty Vaughan, and Arlene Andrews, *State v. Smith*, 1995 WL 702707 (S.C. Gen. Sess. July 26, 1995) (Nos. 94-GS-44-906 & 94-GS-44-907) [hereinafter Transcript, Examination of Steve Derrick].

122. *Id.* at *43. Dr. Andrews stated that part of becoming an independent adult was learning to trust, including learning to trust that when one's parents leave, they will come back. Since Smith's father committed suicide when she was very young, Smith never learned to move on to the next stage and remained "stuck" in dependency. *Id.*

123. *Id.* at *45-46.

124. *Id.* at *47.

125. *Id.* at *52-53 (noting that Smith was very depressed during this time, feeling worthless and ashamed, acquiring self-defeating behavior, becoming anxious and very dependent, and prone to distorted thinking).

year-old supervisor and thirty-year-old co-worker, both of whom she had been involved with sexually.¹²⁶

Smith's marriage to David Smith, the father of their two children, was rocky and characterized by repeated intervals of separation and reconciliation.¹²⁷ During one of these separation periods, Smith had intimate affairs with Tom Findlay as well as Findlay's father, Cary, who owned Conso Products, where Smith was employed.¹²⁸ David Smith found a letter Smith had written to Tom Findlay and pressed Smith into giving him the details of the affair, including Smith's relationship with Cary Findlay.¹²⁹ The prosecution argued that Smith killed her children because Tom Findlay did not want to be burdened by someone who had a "readymade" family.¹³⁰ The defense, on the other hand, argued that Smith was driven to commit suicide because her husband's threat to disclose her affairs would have left her jobless, disgraced, and alone.¹³¹

These kinds of fears, in the past, had aggravated Smith's depressive disorder and had prompted her suicidal attempts.¹³² The situation was no different here. However, the defense argued, at the last minute, Smith, perhaps in a moment of unconscious self-preservation, jumped out of the car without thinking and did not realize that she had left her two children in the car to die.¹³³ Since her depression prevented her from possessing the neces-

126. *Id.* at *54.

127. *Id.* at *56-60.

128. *Id.* at *59-61.

129. *Id.*

130. See REKERS, *supra* note 112, at 141 (referring to a "readymade" family). Tom Findlay had written a letter to Susan explaining his feelings about the children as well as other differences between the two of them. Transcript of Testimony at *7-8, *South Carolina v. Smith*, 1995 WL 465719 (S.C. Gen. Sess. July 19, 1995) (Nos. 94-GS-44-906, 94-GS-44-907) (relying on the testimony and letter of Tom Findlay). An excerpt of the letter concerning the children is as follows:

Susan, I can really fall for you. You have so many endearing qualities about you, and I think that you are a terrific person. But like I have told you before, there are some things about you that aren't suited for me, and yes, I am speaking about your children. I'm sure that your kids are good kids, but it really wouldn't matter how good they may be. The fact is, I just don't want children. These feelings may change one day, but I doubt it. With all of the crazy, mixed-up things that take place in this world today, I just don't have the desire to bring another life into it. And I don't want to be responsible for anyone else's children, either. But I am very thankful that there are people like you who are not so selfish as I am, and you don't mind bearing the responsibility of children. If everyone thought the way I do, our species would eventually become extinct.

Id.

131. Transcript, Examination of Steve Derrick, *supra* note 121, at *60-61.

132. See *id.*

133. Transcript, Closing Arguments, *supra* note 112, at *22 ("And [defense witness] Dr. Halleck concluded after reviewing the whole history, everything that I have just passed over quickly now, that she was in a depressive crisis, in a depressive episode. And in the

sary mental state for premeditated murder, the defense argued, Smith should not be given a death sentence.¹³⁴ Closing arguments reiterated this theme of lifelong disorder. The strategy also explained why the defense “presented the evidence about Susan Smith’s entire life, going all the way back generations to show . . . her bloodline and her genetic inheritance and her susceptibility to pressure, and coming all the way forward.”¹³⁵

Media interviews with some of the members of Smith’s jury indicated that such biographical evidence appeared to be persuasive in their decision to reject the death penalty.¹³⁶ Smith received a life term with the opportunity to be paroled in 2024.¹³⁷ According to some jurors, particular aspects of Smith’s life circumstances appeared to explain the reasons for her behavior—the suicide of her biological father followed by molestation and sexual abuse by her stepfather, as well as Smith’s own suicide attempts at ages thirteen and eighteen and her troubling sexual relationships while she was an adult.¹³⁸ In the eyes of one juror, for example, such family tragedies were “not dealt with properly, and that led up to what [Smith] did”¹³⁹ and “the irrational decisions that she made.”¹⁴⁰ In the eyes of another juror, the actions of Smith’s stepfather were partly responsible, and he ““should be

irrationality of that moment she made the irrational choice of suicide.”); *id.* at *20-23 (relying on the testimony of defense witness Dr. Seymour Halleck).

134. *Id.* at *17.

135. *Id.*

136. See Mike Dorning, *Jurors Hope Susan Smith Gets Psychiatric Help*, AUSTIN AM., July 30, 1995, at A2 (interviews with Smith trial jurors Robbie Christian, Deborah Benvenuti, Roy Palmer, and John Dunn); *CBS This Morning, Interview with Smith Trial Juror Michael Roberts* (CBS television broadcast July 31, 1995) (transcript on file with author) (interview by anchor Paula Zahn); *CNN News, Smith Juror Discusses Susan Smith Verdict* (CNN television broadcast July 29, 1995) (Transcript # 1156-3 on file with author) (interview with Smith trial juror Michael Roberts by anchor Jeanne Meserve); see also *South Carolina Mother Sentenced to Life in Sons’ Drownings; Smith Avoids Death Penalty; Other Developments*, FACTS ON FILE WORLD NEWS DIG., Aug. 3, 1995, at A1 (discussing some of the key testimony in the case that influenced jurors).

137. During the guilt-or-innocence phase, the jury of nine men and three women convicted Smith on two counts of murder after deliberating for less than three hours. See Tom Morgenthau, *Will They Kill Susan Smith?*, NEWSWEEK, July 31, 1995, at 65. During the penalty phase, the same jury again deliberated less than three hours and sentenced Smith to life in prison. See Transcript, Closing Arguments, *supra* note 112, at *51 (quoting Albert Epps, Jury Foreman). Information provided by the South Carolina Department of Corrections indicates that Susan Smith will be eligible for parole on November 4, 2024, after serving a minimum of thirty years. Presently, she is incarcerated at Leath Correctional Institution in Greenwood County, South Carolina. See *Incarcerated Inmate Search*, SOUTH CAROLINA DEPARTMENT OF CORRECTIONS, <https://sword.doc.state.sc.us/scdc-public/?id=00221487&youth=N&type=F>; <http://www.webcitation.org/5s3Pjuosa>.

138. Dorning, *supra* note 136; *CBS This Morning, supra* note 136; *CNN News, supra* note 136.

139. *CBS This Morning, supra* note 136.

140. *CNN News, supra* note 136.

locked up with her.”¹⁴¹ Yet another juror expressed concern over Smith’s mental illness and the hope that Smith would get the appropriate help for it in prison.¹⁴²

At the same time, Smith’s jury still found her guilty of murder because they were convinced that she had understood the difference between right and wrong; she had also made a conscious decision to drown her sons, and she could have decided otherwise.¹⁴³ Compared to the Stephen Mobley case, however, there was no evidence in Smith’s case of a strong legal or public outcry against the use of behavioral genetics evidence. Nor do news stories about the Smith case appear to associate her with a kind of behavioral genetics defense.

C. “Exotic” Mitigation Stories

There is no mystery about why Susan Smith avoided a death sentence. Reasons include Smith’s lack of past violent conduct, her history of family abuse, her depression and mental health challenges, her remorse, as well as her attorneys’ efforts to offer uncontroversial genetics evidence. However, this Article’s message is not based on an attempt to substantively compare Smith’s case with that of Stephen Mobley. Instead, what Smith’s case shows is the importance of behavioral genetics evidence to telling a defendant’s story, whether or not that evidence successfully outweighs the aggravating factors in that story or is even particularly compelling. In Smith’s case the evidence appeared persuasive, perhaps in part because behavioral genetics factors also reveal as much about environmental influences on a defendant as they do about a defendant’s heritable traits.

Indeed, modern research continues to emphasize the importance of environmental effects on behavior,¹⁴⁴ thereby dashing the common myth that an individual’s genetic structure is unchanging.¹⁴⁵ During the past decade in particular, criminological investigations have increasingly incorporated genetic, biological, and social measures as vehicles for understanding crime. When these studies employ many different kinds of variables, their results show that genetics and biology continually accentuate the significance of social factors on behavior—so much so that the three interactive categories (“genetic,” “biological,” and “social”) are often difficult to separate and decipher.¹⁴⁶ Recent federally-funded meetings on genetics and

141. Dorning, *supra* note 136.

142. *Id.*

143. *CBS This Morning*, *supra* note 136.

144. *See supra* notes 22-37, 47-54 and accompanying text.

145. *See supra* notes 32-34 and accompanying text.

146. For examinations of the relationships among these variables see CAREY, *supra* note 23; Owen D. Jones & Timothy H. Goldsmith, *Law and Behavioral Biology*, 105 COLUM. L. REV. 405, 487 (2005); Moffitt, *supra* note 35; Tehrani & Mednick, *supra* note 5.

crime emphasize this very interactive aspect, and the meetings have ceased to draw the negative publicity that they have in the past.¹⁴⁷

Irrespective of how researchers are handling this evidence, different courts can still have varying perspectives. The *Mobley* court, for example, viewed the theory of a link between behavioral genetics and violence as “unorthodox.”¹⁴⁸ In 2001, a Ninth Circuit Court of Appeals panel in *Landrigan v. Stewart*¹⁴⁹ still considered such evidence “exotic” and ineffectual as mitigation.¹⁵⁰ As recently as 2007, in *Schriro v. Landrigan*,¹⁵¹ the United States Supreme Court validated the Ninth Circuit panel’s assessment by directly quoting part of the panel’s conclusions.¹⁵²

At the same time, a fuller account of the *Landrigan* case shows twists and turns in how the evidence was treated because the Ninth Circuit was, at one point, more accepting of it. Jeffrey Landrigan was convicted of murder and sentenced to death in 1993,¹⁵³ one year before Stephen Mobley.¹⁵⁴ After the Arizona Supreme Court affirmed Landrigan’s conviction and sentence¹⁵⁵ and the district court rejected Landrigan’s petition for habeas corpus relief, Landrigan appealed to the Ninth Circuit Court of Appeals.¹⁵⁶ Landrigan’s numerous post conviction appeals and petitions were based in part on a claim of ineffective assistance of counsel, arguing that his counsel did not investigate and introduce a sufficient amount of acceptable mitigating evidence.¹⁵⁷ The three-judge appellate panel denied Landrigan’s ineffective assistance of counsel claim and affirmed the district court’s decision.¹⁵⁸ Citing *Mobley v. Head*¹⁵⁹ and *Turpin v. Mobley*,¹⁶⁰ the panel emphasized that the “rather exotic . . . genetic violence theory” pinpointing the impact of Landrigan’s “biological background” would not have affected the outcome of Landrigan’s trial, even if the theory had been introduced.¹⁶¹ As the panel

147. Cohen, *supra* note 19.

148. *Turpin v. Mobley*, 502 S.E.2d 458, 463 (Ga. 1998).

149. 272 F.3d 1221 (9th Cir. 2001).

150. *Id.* at 1228.

151. 550 U.S. 465 (2007).

152. *Id.* at 481.

153. *State v. Landrigan*, 859 P.2d 111, 114 (Ariz. 1993).

154. *See Turpin*, 502 S.E.2d at 460.

155. *Landrigan*, 859 P.2d at 118.

156. *Landrigan v. Stewart*, 272 F.3d 1221, 1223 (9th Cir. 2001).

157. *Id.* at 1224.

158. *Id.* at 1229.

159. 267 F.3d 1312 (11th Cir. 2001).

160. 502 S.E.2d 458 (Ga. 1998).

161. *Landrigan*, 272 F.3d at 1228 n.4. Landrigan refuted the panel’s reliance on the *Mobley* cases in a subsequent supplemental brief. Supplemental Brief of Petitioner-Appellant at 2, *Landrigan v. Stewart*, 397 F.3d 1235 (9th Cir. 2005) (No. 00-99011). Citing a wide range of research for support, the brief emphasized that Landrigan’s genetic predisposition does not render violent behavior a certainty but simply indicates a higher risk for antisocial tendencies. *Id.* at 1-6.

explained, “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.”¹⁶² Given Landrigan’s reluctance to express remorse or provide the reasons for his crimes, his behavioral genetics would not have been persuasive.¹⁶³

After further petitions,¹⁶⁴ in 2005, the Ninth Circuit Court of Appeals ordered that Landrigan’s case be reheard en banc.¹⁶⁵ On rehearing, the Court of Appeals affirmed in part, reversed in part, and remanded the case.¹⁶⁶ In so doing, the Ninth Circuit’s opinion indicated a considerable amount of openness and receptivity concerning Landrigan’s efforts to introduce mitigating genetic and family history evidence.¹⁶⁷

Such receptivity was short-lived, however. In 2007, on grant of certiorari, the Supreme Court reversed and remanded, forcefully supporting a number of the concerns about Landrigan’s dangerousness that were articulated by the Ninth Circuit’s initial decision.¹⁶⁸ Addressing Landrigan’s alleged genetic predisposition to violence, for example, the Court found it “difficult to improve upon the initial Court of Appeals panel’s conclusion” that Landrigan “not only failed to show remorse or offer mitigating evidence, but he flaunted his menacing behavior”; therefore, “assuring the court that genetics made him the way he is could not have been very helpful.”¹⁶⁹ Describing Landrigan’s mitigation evidence as “weak,” and noting that “the postconviction court was well acquainted with Landrigan’s exceedingly violent past and had seen first hand his belligerent behavior,” the

162. *Landrigan*, 272 F.3d at 1229.

163. *Id.*

164. *Schriro v. Landrigan*, 550 U.S. 465, 471-72 (2007); *Behavioral Genetics Evidence*, *supra* note 19, at 339-41.

165. *Landrigan v. Stewart*, 397 F.3d 1235, 1235 (9th Cir. 2005).

166. *Landrigan v. Schriro*, 441 F.3d 638, 650 (9th Cir. 2006).

167. *Id.* (“We conclude Landrigan has alleged facts that, if demonstrated to be true, present a colorable claim that he received ineffective assistance of counsel in his capital sentencing proceeding.”).

168. *Landrigan*, 550 U.S. at 481. The Supreme Court also disagreed with the en banc court’s opinion regarding Landrigan’s refusal to permit the introduction of mitigating evidence, finding that Landrigan “plainly . . . informed his counsel not to present any mitigating evidence.” *Id.* at 476. Given that much of the testimony of the proffered witnesses would have “overlap[ped] with the evidence Landrigan now wants to present,” the Court held it to be clearly established “that Landrigan would have undermined the presentation of any mitigating evidence that his attorney might have uncovered.” *Id.* at 476-77. With regard to the question of whether “Landrigan’s decision not to present mitigating evidence was ‘informed and knowing,’” *id.* at 478, the Court noted first that “[w]e have never imposed [such a] requirement upon a defendant’s decision not to introduce evidence,” *id.* at 479, and then proceeded to outline several additional reasons why the claim was without merit. *Id.* at 479-80 (citations omitted).

169. *Id.* at 481 (quoting *Landrigan v. Stewart*, 272 F.3d 1221, 1229 (9th Cir. 2001)).

Court concluded that the district court did not abuse “its discretion in declining to grant Landrigan an evidentiary hearing.”¹⁷⁰

Presumably, *Landrigan*, like *Mobley*, would have implications for other kinds of behavioral genetics evidence cases, irrespective of the types of factors those other cases may try to introduce.¹⁷¹ Both *Landrigan* and *Mobley* questioned the value, relevance, and significance of such evidence in the context of a defendant’s appeal for mitigation.¹⁷² At the same time, the Supreme Court has in no way dismissed the potential applicability of behavioral genetics evidence in cases where the Court may perceive the evidence as more acceptable and the defendant as more remorseful. The Court did not provide a test or standard suggesting how it may weigh such information in the future; yet it did accentuate particularly negative aspects of Landrigan’s attitude and demeanor that other defendants may lack.¹⁷³

This Author’s Study of behavioral genetics evidence in criminal court cases is an effort to determine how courts have treated such evidence following the *Landrigan* Court’s conclusions. As Part II shows, there is no court that has been so dismissive of the evidence, quite the contrary. Instead, courts seem to take the evidence in stride with what a defendant has to offer, whether or not that perspective changes the outcome of the defendant’s case.

II. BEHAVIORAL GENETICS EVIDENCE CASES: 2007-2011

This Part analyzes thirty-three criminal cases that have referred to behavioral genetics evidence over the past four years, that is, since June 1, 2007, when this Author’s last study of behavioral genetics evidence ended, to July 1, 2011.¹⁷⁴ These thirty-three cases, which are summarized in this Article’s Appendix¹⁷⁵ and in Charts 1-5,¹⁷⁶ were compiled using legal research databases only.¹⁷⁷ Other cases may exist in which behavioral genetics

170. *Id.*

171. *Behavioral Genetics Evidence*, *supra* note 19, at 339-41.

172. *See id.* 317-30.

173. *See Landrigan*, 550 U.S. at 481. Given the Court’s emphasis on Landrigan’s “exceedingly violent past” and absence of remorse, as well as some of the case’s evidentiary weaknesses, *id.*, a defendant who avoided one or more of these drawbacks would have a stronger argument.

174. *See Behavioral Genetics Evidence*, *supra* note 19, at 465-98; *infra* App.

175. *See infra* App.

176. *See infra* Charts 1-5.

177. The case selection techniques were comparable to those used in the Author’s prior studies of behavioral genetics evidence in criminal cases. *See generally Behavioral Genetics Evidence*, *supra* note 19; *Revisiting the Legal Link*, *supra* note 28. Searches for decisions were conducted using LexisNexis and Westlaw, the two major legal research databases. Over the years, these legal databases have expanded the content available online to include cases that are not published and therefore not found in official legal reporters. There-

evidence was at issue or could have been at issue; however, such cases were not available in legal databases and likewise were not made known publicly in a way that made them readily verifiable (for example, there were only news articles written about them).¹⁷⁸ This selection strategy promotes consistency across cases and accountability across time periods, not only within this particular Study, but also with the Author's earlier study of forty-eight behavioral genetics evidence cases (1994-2007).

Of course, there are vastly different types of behavioral genetics evidence, as this Article discusses.¹⁷⁹ It is somewhat artificial to aggregate all the research under one heading. This type of lumping can also potentially confuse debates about when and where such evidence should be appropriately applied. The umbrella heading of "behavioral genetics evidence" is used here, however, to make general points, while recognizing that the conclusions could differ in their accuracy and relevancy depending on the type and quality of evidence at issue (for example, MAOA deficiency compared to a family history). The next Section examines the behavioral genetics evidence uncovered in this Study by answering a series of questions about when and how courts apply it.

fore, the parameters of this Article's search included the following: published opinions, unpublished opinions, opinions that are slated to be published, and opinions in which the state of publication is, at the time of this Article's writing, unclear. Both LexisNexis and Westlaw clarify an opinion's publication status when they are provided the relevant information to do so. In order to make the content of this Article's search consistent across all cases, the search looked only at opinions and not at the briefs for those opinions because case briefs are not available for all cases on LexisNexis and Westlaw.

As mentioned, the search incorporated judicial decisions released between June 1, 2007, and July 1, 2011. In order to collect the relevant opinions and make the search consistent with the Author's past studies, the search was limited to decisions in which courts reference permutations of the following terms: genetics, family history, family background, propensity, and predisposition. Some of the searches also contained the terms "mitigating" and "aggravating." An additional search was conducted in light of *Cullen v. Pinholster*, 131 S. Ct. 1388 (2011), by focusing on cases citing *Pinholster* that referenced behavioral genetics evidence. For a discussion of *Pinholster* and why the case warranted this research see *infra* Subsection III.D. To be included in this Article's study, a court must have announced a disposition in a case where a party either introduced or sought to introduce behavioral genetics evidence at any point in the proceeding (e.g., innocence-or-guilt phase, penalty phase, post-conviction hearing, evidentiary hearing, etc.). Cases in which behavioral genetics evidence was introduced post-trial were included in the Study only if the court took action on the basis of that evidence. Such action could consist of granting an evidentiary hearing on its basis, finding ineffective assistance of counsel for counsel's failure to pursue the evidence, or finding prior court error for failure to admit the evidence. The Author also required that the court have considered the behavioral genetics evidence as part of its rationale for a particular holding.

178. A general Internet search turned up references to cases in which behavioral genetics evidence was relevant; in most instances, however, efforts to locate such cases on Westlaw or LexisNexis were unsuccessful.

179. See *infra* Subsection II.B.

A. When and How Evidence Is Introduced

All but one of the thirty-three cases began as a capital case in which the defendant was initially sentenced to death by a judge or jury, as Chart I shows.¹⁸⁰ The single exception is *Morris v. Malfi*,¹⁸¹ which started as a life-in-prison case in which the defendant challenged his sentence claiming he was tried and adjudicated while incompetent.¹⁸² It is striking, then, that behavioral genetics evidence is of significance nearly exclusively in death penalty cases, and it is applied in no case involving less than a life sentence. Thus, discussions of the effects of such evidence in the guilt-or-innocence phase of a trial, while conceptually important,¹⁸³ are not directly applicable to situations where genetics factors are instead used as mitigation evidence in the penalty phase of a capital trial.

Attempts to exclude such evidence therefore affect most strongly a pocket of individuals facing the possibility of execution. The implications can be powerful for those defendants' fates. In ten of this Study's thirty-three cases, defendants originally sentenced to death had their death sentence vacated on appeal.¹⁸⁴ In seven of those ten cases, a counsel's failure to

180. See *infra* Chart 1.

181. No. C 06-7409 SI, 2010 WL 2629738 (N.D. Cal. June 29, 2010), *aff'd*, 449 F. App'x 686 (9th Cir. 2011).

182. *Id.* at *11, *16 (denying writ of habeas corpus on the basis that the new evidence did not raise real questions of Morris's incompetence at the time of the crime, but issued a certificate of appealability).

183. For an overview of an excellent literature examining the links between behavioral genetics and responsibility see Stephen J. Morse, *Genetics and Criminal Responsibility*, 15 TRENDS COGNITIVE SCI. 378 (2011); Mairi Levitt & Neil Manson, *My Genes Made Me Do It? The Implications of Behavioural Genetics for Responsibility and Blame*, 15 HEALTH CARE ANALYSIS 33 (2007). For a discussion of the gene-environment interaction in the context of the balance between aggravating and mitigating factors see Stephen J. Morse, *Gene-Environment Interactions, Criminal Responsibility, and Sentencing*, in GENE-ENVIRONMENT INTERACTIONS IN DEVELOPMENTAL PSYCHOPATHOLOGY 207, 229-31 (Kenneth A. Dodge & Michael Rutter eds., 2011).

184. See *Detrich v. Ryan*, 619 F.3d 1038, 1069 (9th Cir. 2010), *vacated*, 131 S. Ct. 2449 (2011) (vacating *Detrich's* death sentence and remanding the case to the district court); *Hamilton v. Ayers*, 583 F.3d 1100, 1136 (9th Cir. 2009) (remanding the case to Tulane County Superior Court with instructions to reduce defendant's sentence to life imprisonment without parole); *Jones v. Ryan*, 583 F.3d 626, 647 (9th Cir. 2009), *vacated*, 131 S. Ct. 2091 (2011) (reversing and remanding the case with instructions to issue a writ of habeas corpus); *Morales v. Mitchell*, 507 F.3d 916, 942 (6th Cir. 2007) (finding that the defendant was entitled to a writ of habeas corpus and vacating his death sentence); *Allison v. Cullen*, 725 F. Supp. 2d 924, 925 (C.D. Cal. 2010) (vacating the death sentence and granting relief on the defendant's ineffective assistance of counsel claim); *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *13 (Ala. Oct. 22, 2010) (remanding the case for another penalty-phase hearing); *Hall v. McPherson*, 663 S.E.2d 659, 670 (Ga. 2008) (upholding the habeas court's vacation of the defendant's death sentence); *Woodall v. Simpson*, No. 5:06CV-P216-R, 2009 WL 464939, at *55 (W.D. Ky. Feb. 24, 2009) (vacating the death sentence and remanding the

adequately investigate or present behavioral genetics evidence (mostly along with other factors) was grounds for vacating a death sentence and remanding for imposition of a sentence of life in prison.¹⁸⁵ In yet another case, the court granted an evidentiary hearing where the petitioner claimed that his counsel's failure to find witnesses and records on his background constituted ineffective assistance.¹⁸⁶ According to the petitioner, an adequate investigation would have revealed a range of disorders: a genetic predisposition to alcoholism and mental illness; a childhood filled with "physical abuse, neglect, abandonment, and poverty"; as well as mental illnesses that were never treated, "including depression, post-traumatic stress disorder ('PTSD'), attention deficit-hyperactivity disorder, and polysubstance abuse."¹⁸⁷ Because alcoholism and violence were prevalent in the petitioner's family, the mitigating evidence that counsel ignored "would have shown that petitioner was born 'into a family marked by extreme pathology and dysfunction over multiple generations.'"¹⁸⁸

This Author's prior analysis of forty-eight behavioral genetics evidence cases (from 1994-2007) showed that attorneys employed three basic

case to state trial court); *Malone v. State*, 168 P.3d 185, 215, 230 (Okla. Crim. App. 2007) (reversing the defendant's death sentence); *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *15 (Pa. D. & C. May 13, 2010) (vacating the death sentence and sentencing the defendant to life in prison).

185. See *Detrich v. Ryan*, 619 F.3d 1038, 1065, 1068-69 (9th Cir. 2010), *vacated*, 131 S. Ct. 2449 (2011) (vacating death sentence on finding that failure to include mitigating evidence of Detrich's neuropsychological damage, along with his traumatic and abusive childhood, was ineffective assistance of counsel); *Hamilton v. Ayers*, 583 F.3d 1100, 1135-36 (9th Cir. 2009) (reducing defendant's sentence to life imprisonment without parole on finding that failure to investigate and present evidence of defendant's childhood and mental health history was prejudicial to the defendant); *Jones v. Ryan*, 583 F.3d 626, 643, 647 (9th Cir. 2009), *vacated*, 131 S. Ct. 2091 (2011) (issuing a writ of habeas on finding that defense counsel had failed to conduct a reasonable mitigation investigation and present sufficient witnesses and evidence at sentencing); *Morales v. Mitchell*, 507 F.3d 916, 942 (6th Cir. 2007) (vacating the death sentence on finding that failure of the defense counsel to conduct an investigation for mitigating evidence, primarily evidence of alcoholism in the family, Morales's own alcoholism and its effects on him, and his upbringing, constituted ineffective assistance of counsel); *Allison v. Cullen*, 725 F. Supp. 2d 924, 925 (C.D. Cal. 2010) (granting relief on Allison's ineffective assistance of counsel for failure to present mitigating evidence claim, as well as several other claims); *Hall v. McPherson*, 663 S.E.2d 659, 664 (Ga. 2008) (upholding vacation of death sentence on finding that the defendant's trial counsel should have investigated further into his background and failure to do so was due to inattention, rather than to a strategic decision); *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *15 (Pa. D. & C. May 13, 2010) (vacating the death sentence on finding that Williams was mentally retarded and therefore ineligible for the death penalty).

186. See *Hawkins v. Wong*, No. CIV S-96-1155 MCE EFB DP, 2010 WL 3516399, at *92 (E.D. Cal. Sept. 2, 2010).

187. *Id.* at *89.

188. *Id.* (citations omitted).

rationales for presenting this evidence: (1) to support a claim of ineffective assistance of counsel; (2) to provide proof and diagnosis of a defendant's mitigating condition; and (3) to indicate some likelihood of the defendant's future dangerousness. As Chart 2 shows, however, in this Article's examination of thirty-three cases during the last four years, attorneys used only the first two of these three rationales (thereby eliminating the rationale of future dangerousness).¹⁸⁹ The great majority of cases (twenty-six cases or seventy-nine percent) involved petitions and appeals by defendants based on claims of ineffective assistance of counsel due to counsel's failure to present behavioral genetics evidence adequately.¹⁹⁰ In addition to applying behavioral genetics evidence to prove ineffective assistance of counsel, some defendants also incorporated the evidence to prove the existence of a mitigating factor. Indeed, nearly half of the cases (fifteen cases or forty-five percent) used behavioral genetics evidence to prove or support a diagnosis of a defendant's mitigating condition.¹⁹¹ Of course, some of the thirty-three cases

189. See *infra* Chart 2.

190. See *Cullen v. Pinholster*, 131 S. Ct. 1388, 1404 (2011); *Worthington v. Roper*, 631 F.3d 487, 494 (8th Cir. 2011); *Rhoades v. Henry*, 638 F.3d 1027, 1045-46 (9th Cir. 2010); *Mickey v. Ayers*, 606 F.3d 1223, 1236 (9th Cir. 2010); *Williams v. Norris*, 612 F.3d 941, 946 (8th Cir. 2010); *Hamilton*, 583 F.3d at 1117; *Morales*, 507 F.3d at 931; *Purkey v. United States*, No. 06-8001-CV-W-FJG, 2010 WL 4386532, at *1 (W.D. Mo. Oct. 28, 2010); *Hawkins*, 2010 WL 3516399, at *90; *Darling v. Sec'y*, No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441, at *19 (M.D. Fla. June 17, 2010); *Creech v. Hardison*, No. CV 99-0224-S-BLW, 2010 WL 1338126, at *10 (D. Idaho Mar. 31, 2010); *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *10-11 (N.D. Miss. Feb. 19, 2010); *Allison*, 2010 U.S. Dist. LEXIS 82957, at *6; *Detrich*, 619 F.3d at 1050; *Henry v. Ryan*, No. CV 02-656-PHX-SRB, 2009 WL 2808220, at *3 (D. Ariz. Mar. 17, 2009); *Jones*, 583 F.3d at 632; *Rienhardt v. Ryan*, 669 F. Supp. 2d 1038, 1050-51 (D. Ariz. 2009); *Woodall v. Simpson*, No. 5:06CV-P215-R, 2009 WL 464939, at *3 (W.D. Ky. Feb. 24, 2009); *Wood v. Schriro*, No. CV-98-053-TUC-JMR, 2007 WL 3124451, at *29 (D. Ariz. Oct. 24, 2007); *Schurz v. Schriro*, No. CV-97-580-PHX-EHC, 2007 WL 3124451, at *13 (D. Ariz. Sept. 25, 2007); *Berryman v. Ayers*, No. 1:95-CV-05309-AWI, 2007 WL 1991049, at *74 (E.D. Cal. July 10, 2007); *Loving v. United States*, 68 M.J. 1, 6 (C.A.A.F. 2009); *Hall*, 663 S.E.2d at 660; *Malone v. State*, 168 P.3d 185, 223 (Okla. Crim. App. 2007); *Commonwealth v. Gibson*, 19 A.3d 512, 518, 525 (Pa. 2011); *Keough v. State*, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937, at *21-22 (Tenn. Crim. App. June 30, 2010). Of the seven behavioral genetics evidence cases that were successful in vacating a death sentence, six were based on claims of ineffective assistance of counsel. The exception was *Commonwealth v. Williams*, which concerned a claim that the defendant was mentally retarded. 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *13-14. See *supra* note 185 and accompanying text.

191. See *Worthington*, 631 F.3d at 494; *Detrich*, 619 F.3d at 1063; *Hamilton*, 583 F.3d at 1127-28; *Hawkins*, 2010 WL 3516399, at *91; *Allison*, 2010 U.S. Dist. LEXIS 82957, at *133-36; *Morris v. Malfi*, No. CV 06-7409 SI, 2010 WL 2629738, at *7 (N.D. Cal. June 29, 2010); *Turner*, 2010 WL 653880, at *10-11; *Worthington v. Roper*, 619 F. Supp. 2d 661, 667, 681-83 (E.D. Mo. 2009); *Henry*, 2009 WL 692356, at *65-67; *Woodall*, 2009 WL 464939, at *44-50; *Hall v. Quarterman*, No. 4:06-CV-436-A, 2009 WL 612559, at *12-15 (N.D. Tex. Mar. 9, 2009); *Wood*, 2007 WL 3124451, at *29-31; *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010); *Brant v. State*, 21 So. 3d 1276, 1280

relied on both rationales (ineffective assistance and proof of diagnosis), thereby creating an overlap between the categories. Strikingly, no case utilized behavioral genetics evidence to indicate the likelihood of a defendant's future dangerousness; indeed, only three of the forty-eight cases in this Author's prior study appeared to incorporate behavioral genetics evidence for this purpose.¹⁹² This finding is significant in light of prior concerns (expressed by *Landrigan*, for example) that such evidence would be used to predict defendants' future dangerousness (or some variant of that theme).¹⁹³ In fact, there is little-to-no indication that such an application would pose a real legal threat.¹⁹⁴

Chart 3 considers the purpose that attorneys have for relying on behavioral genetics evidence in the death penalty context.¹⁹⁵ Notably, in all but four of the thirty-three cases, the evidence is used to mitigate a death sentence. In an additional three cases,¹⁹⁶ behavioral genetics evidence was

(Fla. 2009); *Malone*, 168 P.3d at 195; *Williams*, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6.

192. See *Behavioral Genetics Evidence*, *supra* note 19, at 345-48; see also *infra* note 201 and accompanying text.

193. See *Landrigan v. Stewart*, 272 F.3d 1221, 1229 (9th Cir. 2001).

[A]lthough 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. He had already done that to a fare-thee-well. The prospect was chilling; before he was 30 years of age, Landrigan had murdered one man, repeatedly stabbed another one, escaped from prison, and within two months murdered still another man. . . . On this record, assuring the court that genetics made him the way he is could not have been very helpful.

Id.

The Supreme Court quoted the Ninth Circuit's latter phrases, stating that it could not explain the reasoning any better. See *Schriro v. Landrigan*, 550 U.S. 465, 481 (2007).

"The prospect was chilling; before he was 30 years of age, Landrigan had murdered one man, repeatedly stabbed another one, escaped from prison, and within two months murdered still another man. . . . On this record, assuring the court that genetics made him the way he is could not have been very helpful."

Id.; see also *supra* notes 148-73 and accompanying text (discussing the decisions).

194. See *Behavioral Genetics Evidence*, *supra* note 19, at 345-49.

195. See *infra* Chart 3.

196. In three of the thirty-three cases in this survey, defendants attempted to admit evidence of a genetic predisposition to mental retardation to prove they were ineligible for the death penalty. See *Hall*, 2009 WL 612559, at *18 (upholding the trial court's imposition of the death penalty after reviewing evidence that the defendant exhibited characteristics consistent with genetic disorders such as XXY, Klinefelter Syndrome, YYX, Extra Y Chromosome, or Fragile X Syndrome, all of which would be present from birth and would be indicative of mental retardation); *Smith*, 2010 WL 4148528, at *2 (affirming the trial court's determination that the defendant was not mentally retarded after the defendant presented evidence that he was born with a genetic predisposition to mental retardation and that five members of his immediate family suffer from the same mental infirmity); *Williams*, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6 (finding that the defendant was mentally retarded and

raised to support a claim under *Atkins v. Virginia*.¹⁹⁷ In *Atkins*, the Supreme Court held that executing mentally retarded individuals violates the Eighth Amendment's ban on cruel and unusual punishment.¹⁹⁸ Of course, until 2002, *Atkins* was not an available vehicle in which to incorporate behavioral genetics evidence although it is a particularly apt place for it now. Lastly, in *Morris v. Malfi*,¹⁹⁹ as mentioned, the only non-death penalty case, behavioral genetics evidence was interjected to support arguments that the defendant was not competent to stand trial, the only case in this survey that raised a competency argument.²⁰⁰

Most surprisingly, in no case in this Study did the State introduce behavioral genetics evidence in any capacity, much less as an aggravating factor. As mentioned, this Author's pre-2007 study did find three cases in which behavioral genetics evidence appeared to be used to indicate a defendant's future dangerousness.²⁰¹ Yet, such a rare occurrence within a pool of eighty-one cases examined during a seventeen-year period stunts prior expectations that such evidence would be manipulated to justify the death penalty. This outcome may also be explained in part by the increasing quality of the admitted experts and evidence, which could preclude extreme characterizations or conclusions that a defendant may be "hard-wired" into dangerousness. While behavioral genetics evidence is viewed as a double-edged sword, each side of that sword is not the direct flip of the other. The hurdles for the State are substantially different from those for the defense and their evidence and arguments may not be comparably compelling.

B. The Types of Evidence Introduced

This Section covers a wide span of information under the title, "types of evidence introduced." The discussion starts with an overview of the four overlapping categories of types of evidence, then also considers what kinds of expert witnesses are needed to present it. Included is an examination of courts' perceptions of the experts and the substance of their testimony, especially in the context of defendants' claims of ineffective assistance of counsel. Overall, the analysis illustrates the wide variety of factors that come into play in capital cases and the need for a case-by-case perspective.

therefore ineligible for the death penalty after evaluating expert opinions, including testimony that the defendant was born with "some genetic predisposition to mental retardation").

197. 536 U.S. 304 (2002).

198. *Id.* at 320-21.

199. No. C 06-7409 SI, 2010 WL 2629738 (N.D. Cal. June 29, 2010), *aff'd*, 449 F. App'x 686 (9th Cir. 2011).

200. *Id.* at *11.

201. See *Behavioral Genetics Evidence*, *supra* note 19, at 345-48; see also *supra* note 192 and accompanying text.

Chart 4 shows specifically the nature of the behavioral genetics evidence sought to be admitted in these cases.²⁰² This evidence breaks down into four overlapping categories (signifying that some cases have multiple types of evidence): (1) expert testimony,²⁰³ (2) family history,²⁰⁴ (3) behavioral history,²⁰⁵ and (4) medical history.²⁰⁶ Behavioral histories could consist of school records or other testimony regarding childhood behavior relevant to genetic disorder diagnoses.²⁰⁷ Medical records could comprise any documented medical history be it physical or psychological.²⁰⁸

202. See *infra* Chart 4.

203. See *Rhoades v. Henry*, 638 F.3d 1027, 1048 (9th Cir. 2010); *Detrich v. Ryan*, 619 F.3d 1038, 1063 (9th Cir. 2010); *Jones v. Ryan*, 583 F.3d 626, 634 (9th Cir. 2009); *Hamilton v. Ayers*, 583 F.3d 1100, 1128 (9th Cir. 2009); *Morales v. Mitchell*, 507 F.3d 916, 944 (6th Cir. 2007); *Allison v. Cullen*, No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957, at *168-72 (C.D. Cal. July 22, 2010); *Darling v. Sec'y*, No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441, at *22-23 (M.D. Fla. June 17, 2010); *Morris*, 2010 WL 2629738, at *9; *Creech v. Hardison*, No. CV 99-0224-S-BLW, 2010 WL 1338126, at *10 (D. Idaho Mar. 31, 2010); *Henry v. Ryan*, No. CV 02-656-PHX-SRB, 2009 WL 692356, at *69 (D. Ariz. Mar. 17, 2009); *Hall v. Quarterman*, No. 4:06-CV-436-A, 2009 WL 612559, at *17-18 (N.D. Tex. Mar. 9, 2009); *Woodall v. Simpson*, No. 5:06CV-P216-R, 2009 WL 464939, at *48 (W.D. Ky. Feb. 24, 2009); *Wood v. Schriro*, No. CV-98-053-TUC-JMR, 2007 WL 3124451, at *30 (D. Ariz. Oct. 24, 2007); *Schurz v. Schriro*, No. CV-97-580-PHX-EHC, 2007 WL 2808220, at *40-41 (D. Ariz. Sept. 25, 2007); *Williams v. Norris*, No. 5:07cv00234 SWW, 2008 WL 4820559, at *14 (E.D. Ark. Nov. 4, 2008); *Berryman v. Ayers*, No. 1:95-CV-05309-AWI, 2007 WL 1991049, at *14-15 (E.D. Cal. July 10, 2007); *Loving v. United States*, 68 M.J. 1, 14-15 (C.A.A.F. 2009); *Brant v. State*, 21 So. 3d 1276, 1283 (Fla. 2009); *Simpson v. State*, 3 So. 3d 1135, 1139 (Fla. 2009); *Hall v. McPherson*, 663 S.E.2d 659, 667 (Ga. 2008); *Malone v. State*, 168 P.3d 185, 195 (Okla. Crim. App. 2007); *Commonwealth v. Gibson*, 19 A.3d 512, 519 (Pa. 2011); *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6-8 (Pa. D. & C. May 13, 2010); *Keough v. State*, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937, at *13 (Tenn. June 30, 2010).

204. See *Mickey v. Ayers*, 606 F.3d 1223, 1242-43 (9th Cir. 2010); *Jones*, 583 F.3d at 634; *Hamilton*, 583 F.3d at 1127-28; *Purkey v. United States*, No. 06-8001-CV-W-FJG, 2010 WL 4386532, at *2-3 (W.D. Mo. Oct. 28, 2010); *Hawkins v. Wong*, No. CV. S-96-1155, 2010 WL 3516399, at *89 (E.D. Cal. Sept. 2, 2010); *Allison*, 2010 U.S. Dist. LEXIS 82957, at *134-36, *145; *Morris*, 2010 WL 2629738, at *7; *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *13 (N.D. Miss. Feb. 19, 2010); *Henry*, 2009 WL 692356, at *74; *Williams*, 2008 WL 4820559, at *14; *Wood*, 2007 WL 3124451, at *30-31; *Schurz*, 2007 WL 2808220, at *40-41; *Loving*, 68 M.J. at 14; *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010); *Brant*, 21 So. 3d at 1280; *Hall*, 663 S.E.2d at 667; *Malone*, 168 P.3d at 195; *Keough*, 2010 WL 2612937, at *13.

205. See *Allison*, 2010 U.S. Dist. LEXIS 82957, at *169-71; *Henry*, 2009 WL 692356, at *65; *Rienhardt v. Ryan*, 669 F. Supp. 2d 1038, 1052 (D. Ariz. 2009); *Berryman*, 2007 WL 1991049, at *78.

206. See *Detrich*, 619 F.3d at 1063; *Jones*, 583 F.3d at 631; *Worthington v. Roper*, 619 F. Supp. 2d 661, 682-83 (E.D. Miss. 2009).

207. See *infra* Chart 4.

208. See *infra* Chart 4.

As would be expected, most of the information in Chart 4 derives from some kind of expert evaluation or family history (twenty-four and eighteen cases, respectively), rather than a behavioral or medical history (four and three cases, respectively).²⁰⁹ However, there is overlap between these two categories given that in several of the cases, experts testified to some extent about the defendants' family histories.²¹⁰ In general, all four groups are directed toward similar types of information even if its source varies or it is characterized in different ways.

Family history evidence is especially diverse and has been used to show genetic predispositions towards many different conditions.²¹¹ It is often introduced through the testimony of the defendant's relatives and also through expert testimony.²¹² While in some cases, the behavioral genetics

209. See *infra* Chart 4.

210. See *Detrich v. Ryan*, 619 F.3d 1038, 1049 (9th Cir. 2010) (presenting evidence of head injuries and presenting expert testimony that the defendant had neuropsychological deficits (some of which may have been inherited) that prevented him from controlling his impulses); *Allison v. Cullen*, No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957, at *135-36 (C.D. Cal. July 22, 2010) (presenting family history of alcoholism and depression); *Worthington*, 619 F. Supp. 2d at 682 (presenting evidence of defendant's medical history, including genetic predisposition to and a family history of depression, bipolar disorder, schizophrenia and inherited brain dysfunction); *Williams v. Norris*, No. 5:07cv00234 SWW, 2008 WL 4820559, at *14 (E.D. Ark. Nov. 4, 2008) (presenting defendant's social, physical, educational, and family history); *Hamilton v. Ayers*, 583 F.3d 1100, 1127-28 (9th Cir. 2009) (presenting expert witness testimony that defendant had a family history of genetic disorders and a traumatic upbringing); *Brant v. State*, 21 So. 3d 1276, 1282 (Fla. 2009) (presenting expert testimony from a forensic psychologist that defendant was genetically predisposed to sexual sadism and also presenting defendant's mother's testimony about a family history of depression); *Hall v. McPherson*, 663 S.E.2d 659, 667 (Ga. 2008) (presenting expert testimony from a psychiatrist about defendant's family tree showing a genetic predisposition to substance dependence disorder); *Brant v. State*, 21 So. 3d 1276, 1282 (Fla. 2009) (presenting expert testimony from a forensic psychologist that defendant was genetically predisposed to sexual sadism and also presenting defendant's mother's testimony about a family history of depression).

211. See *Cullen v. Pinholster*, 131 S. Ct. 1388, 1404, 1425 (2011) (family history of alcohol abuse used to support the theory that defendant might have a genetic predisposition to substance abuse and family history of mental illness); *Hawkins v. Wong*, No. Civ. S-96-1155 MCE EFB DP, 2010 WL 3516399, at *91 (E.D. Cal. Sept. 2, 2010) (defendant sought a social historian who could have testified to his family tree, which "included many alcoholics, indicating a family genetic predisposition to alcoholism . . . [and which also] included many violent, abusive, and mentally ill or handicapped persons."); *Allison*, 2010 U.S. Dist. LEXIS 82957, at *169 (family history of alcoholism and depression); *Worthington*, 619 F. Supp. 2d at 672, 682-83 (family history of depression, bipolar disorder, schizophrenia, and inherited brain dysfunction); *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010) (mental retardation); *Brant*, 21 So.3d at 1280 (depression); *Hall*, 663 S.E.2d at 667 (substance dependence disorder); *Malone v. State*, 168 P.3d 185, 195 (Okla. Crim. App. 2007) (addiction and depression); *Commonwealth v. Gibson*, 19 A.3d 512, 519 (Pa. 2011) (alcohol abuse).

212. For expert testimony on behavioral genetics see *Rhoades v. Henry*, 638 F.3d 1027, 1048-49 (9th Cir. 2011); *Detrich*, 619 F.3d at 1063; *Jones*, 583 F.3d at 633-34; *Mo-*

evidence presented consisted almost wholly of the defendant's family history,²¹³ in other cases, defendants had requested experts to assess the mitigation value of establishing a genetic predisposition towards a condition or behavior. For instance, in *Rhoades v. Henry*,²¹⁴ the defendant submitted a 1000-page proffer on appeal, which contained declarations from a variety of sources: a neuropsychologist; an expert who was both a psychiatrist and neurologist; police officers; the defendant's family and friends; medical and criminal records for both the defendant and his family members; the defendant's elementary school transcript; as well as "a family tree depicting drug and alcohol abuse, suicide, intelligence, mental health, and criminal convictions."²¹⁵ According to the neuropsychologist, "The alcoholism and suicides seen in past generations of [the defendant's] family very likely played a genetic role in the mental and emotional health of [the defendant] and his siblings."²¹⁶ Nonetheless, it was the family context of physical and sexual abuse, as well as medical problems and the defendant's chronic use of methamphetamine, that "may well have damaged [the defendant's] brain in areas critical to impulse control and the ability to think clearly in high

rales v. Mitchell, 507 F.3d 916, 944 (6th Cir. 2007); *Morris v. Malfi*, No. C 06-7409 SI, 2010 WL 2629738, at *9 (N.D. Cal. June 29, 2010); *Rienhardt v. Ryan*, 669 F. Supp. 2d 1038, 1052 (D. Ariz. 2009); *Brant*, 21 So. 3d at 1283; *Simpson v. State*, 3 So. 3d 1135, 1139 (Fla. 2009); *Hall*, 663 S.E.2d at 667; *Malone*, 168 P.3d at 195; *Gibson*, 19 A.3d at 519; *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6 (Pa. D. & C. May 13, 2010).

213. See *Hawkins*, 2010 WL 3516399, at *91 (defendant sought a social historian who could have testified to his family tree, which included many alcoholics, indicating a family genetic predisposition to alcoholism, and which also "included many violent, abusive, and mentally ill or handicapped persons"); *Allison*, 2010 U.S. Dist. LEXIS 82957, at *169 (an expert witness suggested that defendant's family history showed that he might have a genetic predisposition to alcoholism, substance abuse, and mental illness); *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *13 (N.D. Miss. Feb. 19, 2010) (family history of mental illness, including a grandmother who had been diagnosed with schizophrenia; genetic predisposition to mental illness); *Worthington*, 619 F. Supp. 2d at 682 (genetic predisposition to and family history of depression, bipolar disorder, and schizophrenia, and inherited brain dysfunction); *Henry v. Ryan*, No. CV 02-656-PHX-SRB, 2009 WL 692356, at *74 (D. Ariz. Mar. 17, 2009) (defendant had a family history of schizophrenia and exhibited symptoms as a child); *Williams v. Norris*, No. 5:07cv00234 SWW, 2008 WL 4820559, at *12 (E.D. Ark. Nov. 4, 2008) (defendant "experienced family dysfunction which extended from 'generation to generation'") (internal cross references omitted); *Wood v. Schriro*, No. CV-98-053-TUC-JMR, 2007 WL 3124451, at *31 (D. Ariz. Oct. 24, 2007) (family history of alcoholism); *Gibson*, 19 A.3d at 519 (family history of alcohol abuse used to support the concept that defendant might have a genetic predisposition to substance abuse); *Keough v. State*, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937, at *13 (Tenn. Crim. App. June 30, 2010) (a specialist in addiction medicine testified that alcoholism is genetic and that defendant had a family history of alcoholism).

214. 638 F.3d 1027 (9th Cir. 2011).

215. *Id.* at 1048.

216. *Id.*

pressured situations.”²¹⁷ Even so, the court found that the aggravating factors outweighed the mitigating factors, and the defendant’s sentence and convictions were affirmed.²¹⁸

The defendant in *Hawkins v. Wong*²¹⁹ had a more favorable outcome.²²⁰ He claimed that his counsel was ineffective for, among other things, failing to hire a social historian who could have explained how the defendant’s background influenced his behavior.²²¹ The Ninth Circuit Court of Appeals agreed with the defendant that his counsel was ineffective. The mitigating evidence would have shown that Hawkins was genetically predisposed to alcoholism and mental illness.²²² A social historian could have also testified about Hawkins’s family tree, which included many alcoholics and indicated a family genetic predisposition to alcoholism, as well as included a range of violent, abusive, and mentally ill or handicapped persons.²²³ The court allowed an evidentiary hearing on the ineffective assistance of counsel claim.²²⁴

As with other kinds of evidence, courts vary on whether behavioral genetics information need be presented by experts. Some courts have said that an expert is not necessary to testify about behavioral genetics factors because the court or the jury is capable of inferring that a defendant’s disposition is inherited. For example, in *Hodges v. Bell*,²²⁵ the defendant wanted a mitigation expert to testify about the genetic transmission of drug and alcohol dependency.²²⁶ The trial court’s decision to deny expert services was upheld because counsel was deemed capable of presenting to the court information about the defendant’s substance addictions and the court was able to process that information without the need for an expert.²²⁷ In *Woodall v. Simpson*,²²⁸ the failure to present a genetic defect defense was also not ineffective assistance of counsel because the court found that the jury could have inferred that, genetically, the defendant’s family had a history of mental problems.²²⁹ In *Darling v. Secretary*,²³⁰ the court determined that since there was contradictory evidence concerning whether the defendant actually

217. *Id.*

218. *Id.* at 1052, 1055.

219. No. CIV. S-96-1155 MCE EFB DP, 2010 WL 3516399 (E.D. Cal. Sept. 2, 2010).

220. *Id.* at *1.

221. *Id.* at *91.

222. *Id.*

223. *Id.*

224. *Id.* at *92.

225. 548 F. Supp. 2d 485 (M.D. Tenn. 2008).

226. *Id.* at 546.

227. *Id.* at 547.

228. No. 5:06CV-P216-R, 2009 WL 464939 (W.D. Ky. Feb. 24, 2009).

229. *Id.* at *48.

230. No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441 (M.D. Fla. June 17, 2010).

suffered from frontal lobe brain damage, counsel was not ineffective in failing to obtain an evaluation and relying instead on a defense witness's testimony.²³¹ Likewise, the court in *Wood v. Schriro*²³² denied defense counsel's request for a neurometric brainmapping technician for the purpose of diagnosing organic brain damage and/or psychopathology in the defendant, finding that "there appear[ed] to be no support for this type of examination."²³³

Despite the lack of complete deference to mental health experts, at least one court has acknowledged the tension between the legal field and medical field. In *Jones v. Ryan*,²³⁴ the district court dismissed each ineffective assistance of counsel claim on finding that the failure to hire a mental health expert (among other claims) was not prejudicial to the defendant because there was not enough evidence presented to show that the defendant suffered from neurological damage caused by head trauma or other factors.²³⁵ The Ninth Circuit Court of Appeals, however, agreed with the defendant that his counsel was ineffective.²³⁶ By allowing a court-appointed expert to testify about the defendant's mental health at sentencing, instead of hiring a mitigation expert or psychiatrist, defense counsel violated the American Bar Association guidelines, Supreme Court precedent, and Ninth Circuit law.²³⁷ The court found that the district court acted improperly in weighing the testimony of the experts in order to determine who was the most credible and whether the defendant had presented evidence confirming that he had neurological damage.²³⁸ In essence, it was not the proper role of the district court to find a "definitive diagnosis" or to evaluate the credibility of the experts.²³⁹

For any one of a number of reasons, other courts seem to be more comfortable drawing conclusions about behavioral genetics evidence presented by experts. In *Hall v. Quarterman*,²⁴⁰ for example, the district court noted testimony presented by and against the defendant on the issue of mental retardation and stated some of the genetic conditions the defendant might have.²⁴¹ Rather than frame mental health findings strictly in terms of the expert's direct testimony, the district court took the expert's findings and drew its own conclusions with respect to the possibilities. According to the court:

231. *Id.* at *28.

232. No. CV-98-053-TUC-JMR, 2007 WL 3124451 (D. Ariz. Oct. 24, 2007).

233. *Id.* at *30.

234. 583 F.3d 626 (9th Cir. 2009).

235. *Id.* at 635-36.

236. *Id.* at 640.

237. *Id.* at 638.

238. *Id.* at 641.

239. *Id.*

240. No. 4:06-CV-436-A, 2009 WL 612559 (N.D. Tex. Mar. 9, 2009).

241. *Id.* at *18.

In addition to [the expert, Dr. Sally Church's] diagnosis that Applicant is mentally retarded, Dr. Church note[d] that Applicant's physical appearance is typical of a person who suffers from Fetal Alcohol Syndrome or Fetal Alcohol Effect. It is entirely possible that Applicant suffers from one of these conditions as there is evidence that Applicant's mother was an alcoholic. Either of these conditions would be a correlate of Applicant's mental retardation.

Also, Applicant exhibits characteristics consistent with genetic disorders such as XXY, Klinefelter Syndrome, YYX, Extra Y Chromosome, or Fragile X Syndrome. All of these disorders are usually related to mental retardation and are present at the time of birth.²⁴²

C. Why Evidence Is Introduced

Regardless of how behavioral genetics evidence is presented, Chart 5 indicates that most of the evidence is applied to validate the existence of a serious condition, typically a mental illness or addiction. A defendant could introduce this evidence as mitigation during the penalty phase or at trial during the guilt-or-innocence phase, irrespective of whether that evidence was accompanied by genetic associations.²⁴³ Therefore, most of the factors listed in Chart 5 constitute traditional kinds of defenses and mitigating evidence that courts have long admitted into court for a wide range of reasons.

Chart 5 also depicts the different reasons defendants have offered for submitting behavioral genetics information and how receptive courts have been to it.²⁴⁴ Chart 5's label, *Genetics Evidence Offered by Defendant*, refers to instances where defendants presented evidence to show they were genetically predisposed toward a particular condition or behavioral pattern. In comparison, the label *Genetics Evidence Rejected by Court*, refers to the few instances where courts refused to admit behavioral genetics evidence either at trial or in post-trial proceedings or they were simply silent on the issue.

Overall, Chart 5's statistics indicate that in almost all cases where a defendant presented behavioral genetics evidence, the court admitted the evidence at trial or analyzed the evidence in post-trial proceedings.²⁴⁵ This response was consistent among all of Chart 5's eleven categories: substance dependency,²⁴⁶ alcohol dependency,²⁴⁷ mental illness,²⁴⁸ depression,²⁴⁹ mental

242. *Id.*

243. *See infra* Chart 5. The total number of cases exceeds the number of examined cases (thirty-three), because in some cases the evidence was applied to validate more than one condition.

244. *See infra* Chart 5.

245. *See infra* Chart 5.

246. *See infra* Chart 5, SUBSTANCE DEPENDENCY. For cases where evidence was offered to the court see *Cullen v. Pinholster*, 131 S. Ct. 1388, 1404 (2011); *Worthington v. Roper*, 631 F.3d 487, 493, 501, 510 (8th Cir. 2011); *Rhoades v. Henry*, 638 F.3d 1027, 1048-49 (9th Cir. 2010); *Mickey v. Ayers*, 606 F.3d 1223, 1247 (9th Cir. 2010); *Jones v.*

retardation,²⁵⁰ bipolar disorder,²⁵¹ schizophrenia,²⁵² predisposition toward violence,²⁵³ propensity toward criminal behavior,²⁵⁴ sexual sadism,²⁵⁵ and

Ryan, 583 F.3d 626, 632-34 (9th Cir. 2009) (9th Cir. 2009); *Rienhardt v. Ryan*, 669 F. Supp. 2d 1038, 1052 (D. Ariz. 2009); *Hodges v. Bell*, 548 F. Supp. 2d 485, 491 (M.D. Tenn. 2008); *Purkey v. United States*, No. 06-8001-CV-W-FJG, 2010 WL 4386532, at *6 n.1 (W.D. Mo. Oct. 28, 2010); *Allison v. Cullen*, No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957, at *169 (C.D. Cal. July 22, 2010); *Darling v. Sec'y*, No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441, at *24 (M.D. Fla. June 17, 2010); *Schurz v. Schriro*, No. CV-97-580-PHX-EHC, 2007 WL 2808220, at *42 (D. Ariz. Sept. 25, 2007); *Loving v. United States*, 68 M.J. 1, 14-15 (C.A.A.F. 2009); *Simpson v. State*, 3 So. 3d 1135, 1139 (Fla. 2009); *Hall v. McPherson*, 663 S.E.2d 659, 667 (Ga. 2008); *Malone v. State*, 168 P.3d 185, 195 (Okla. 2007); *Commonwealth v. Gibson*, 19 A.3d 512, 519 (Pa. 2011). This evidence was rejected in *Pinholster*, 131 S. Ct. at 1404; *Mickey v. Ayers*, 606 F.3d 1223, 1236, 1247 (9th Cir. 2010).

247. See *infra* Chart 5, ALCOHOL DEPENDENCY. For cases where evidence was offered to the court see *Rhoades*, 638 F.3d at 1048-49; *Morales v. Mitchell*, 507 F.3d 916, 931 (6th Cir. 2007); *Worthington v. Roper*, 619 F. Supp. 2d 661, 683 (E.D. Mo. 2009); *Rienhardt*, 669 F. Supp. 2d at 1052; *Hodges*, 548 F. Supp. 2d at 491; *Purkey*, 2010 WL 4386532, at *6 n.1; *Hawkins v. Wong*, No. CV. S-96-1155, 2010 WL 3516399, at *91 (E.D. Cal. Sept. 2, 2010); *Allison*, 2010 U.S. Dist. LEXIS 82957, at *169; *Wood v. Schriro*, No. CV-98-053-TUC-JMR, 2007 WL 3124451, at *29-31 (D. Ariz. Oct. 24, 2007); *Schurz*, 2007 WL 2808220, at *42; *Berryman v. Ayers*, No. 1:95-CV-05309-AWI, 2007 WL 1991049, at *68-70 (E.D. Cal. July 10, 2007); *Loving*, 68 M.J. at 15; *Simpson*, 3 So. 3d at 1139; *Keough v. State*, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937, at *13 (Tenn. Crim. App. June 30, 2010). This evidence was rejected in *Berryman*, 2007 WL 1991049, at *85 (E.D. Cal. July 10, 2007); *Keough*, 2010 WL 2612937, at *23.

248. See *infra* Chart 5, MENTAL ILLNESS. For cases where evidence was offered to the court see *Pinholster*, 131 S. Ct. at 1404; *Worthington*, 631 F.3d at 494; *Detrich v. Ryan*, 619 F.3d 1038, 1063 (9th Cir. 2010); *Hamilton v. Ayers*, 583 F.3d 1100, 1126-28 (9th Cir. 2009); *Hawkins*, 2010 WL 3516399, at *91; *Allison*, 2010 U.S. Dist. LEXIS 82957, at *172-73; *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *13 (N.D. Miss. Feb. 19, 2010); *Woodall v. Simpson*, No. 5:06CV-P216-R, 2009 WL 464939, at *43 (W.D. Ky. Feb. 24, 2009); *Wood*, 2007 WL 3124451, at *29-30. This evidence was rejected in *Pinholster*, 131 S. Ct. at 1404.

249. See *infra* Chart 5, DEPRESSION. For cases where evidence was offered to the court see *Hamilton*, 583 F.3d at 1127-28; *Worthington*, 619 F. Supp. 2d at 667, 681-82; *Brant v. State*, 21 So. 3d 1276, 1280 (Fla. 2009); *Malone*, 168 P.3d at 195.

250. See *infra* Chart 5, MENTAL RETARDATION. For cases where evidence was offered to the court see *Hall v. Quarterman*, No. 4:06-CV-436-A, 2009 WL 612559, at *33, *40 (N.D. Tex. Mar. 9, 2009); *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010); *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6 (Pa. D. & C. May 13, 2010). This evidence was rejected in *Smith*, 2010 WL 4148528, at *7, *13.

251. See *infra* Chart 5, BIPOLAR DISORDER. For a case where evidence was offered to the court see *Worthington*, 619 F. Supp. 2d at 681-82.

252. See *infra* Chart 5, SCHIZOPHRENIA. For cases where evidence was offered to the court see *Worthington*, 619 F. Supp. 2d at 682; *Morris v. Malfi*, No. 06-7409 SI, 2010 WL 2629738, at *7 (N.D. Cal. June 29, 2010); *Henry v. Ryan*, No. CV 02-656-PHX-SRB, 2009 WL 692356, at *65 (D. Ariz. Mar. 17, 2009).

253. See *infra* Chart 5, PREDISPOSITION TOWARD VIOLENCE. For a case where evidence was offered to the court see *Creech v. Hardison*, No. CV 99-0224-S-BLW, 2010 WL 1338126, at *10 (D. Idaho Mar. 31, 2010).

family dysfunction.²⁵⁶ It is striking that behavioral genetics evidence is primarily used to validate the existence of a substance or alcohol dependency, followed by either unspecified or specified (e.g., depression) mental illness, then some kind of propensity for criminality or violence, and lastly, family dysfunction. Relative to these other conditions, however, the substance/alcohol dependency association is especially pronounced. In twenty of the thirty-three cases examined—or well over half (sixty-one percent) of all the cases—courts found a link between alcohol and/or substance abuse and behavioral genetics evidence.²⁵⁷ In sharp contrast, courts linked behavioral genetics evidence solely to other conditions in only thirteen cases (thirty-nine percent).²⁵⁸ It is important to note that in most cases where a defendant presented evidence of a genetic predisposition to alcohol or substance

254. See *infra* Chart 5, PROPENSITY TOWARD CRIMINAL BEHAVIOR. For cases where evidence was offered to the court see *Cullen v. Pinholster*, 131 S. Ct. 1388, 1404 (2011); *Rienhardt v. Ryan*, 669 F. Supp. 2d 1038, 1052 (D. Ariz. 2009).

255. See *infra* Chart 5, SEXUAL SADISM. For a case where evidence was offered to the court see *Brant v. State*, 21 So. 3d 1276, 1281 (Fla. 2009).

256. See *infra* Chart 5, FAMILY DYSFUNCTION. For cases where evidence was offered to the court see *Williams v. Norris*, 612 F.3d 941, 945 (8th Cir. 2010); *Worthington*, 619 F. Supp. 2d at 667; *Schurz v. Schriro*, No. CV-97-580-PHX-EHC, 2007 WL 2808220, at *41, *47 (D. Ariz. Sept. 25, 2007); *Loving v. United States*, 68 M.J. 1, 14 (2009).

257. See *Pinholster*, 131 S. Ct. at 1404; *Worthington v. Roper*, 631 F.3d 487, 493, 501, 510 (8th Cir. 2011); *Rhoades v. Henry*, 638 F.3d 1027, 1048-49 (9th Cir. 2010); *Mickey v. Ayers*, 606 F.3d 1223, 1236, 1247 (9th Cir. 2010); *Jones v. Ryan*, 583 F.3d 626, 632-34 (9th Cir. 2009); *Morales v. Mitchell*, 507 F.3d 916, 931 (6th Cir. 2007); *Rienhardt*, 669 F. Supp. 2d at 1052; *Hodges v. Bell*, 548 F. Supp. 2d 485, 491 (M.D. Tenn. 2008); *Purkey v. United States*, No. 06-8001-CV-W-FJG, at *6 (W.D. Mo. Oct. 28, 2010); *Allison v. Cullen*, No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957, at *169 (C.D. Cal. July 22, 2010); *Darling v. Sec'y*, No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441, at *22 (M.D. Fla. June 17, 2010); *Wood v. Schriro*, No. CV-98-053-TUC-JMR, 2007 WL 3124451, at *45 (D. Ariz. Oct. 24, 2007); *Schurz*, 2007 WL 2808220, at *40-41 (D. Ariz. Sept. 25, 2007); *Berryman v. Ayers*, No. 1:95-CV-05309-AWI, 2007 WL 1991049, at *17 (E.D. Cal. July 10, 2007); *Loving*, 68 M.J. at 14-15; *Simpson v. State*, 3 So. 3d 1135, 1139 (Fla. 2009); *Hall v. McPherson*, 663 S.E.2d 659, 667 (Ga. 2008); *Malone v. State*, 168 P.3d 185, 195 (Okla. 2007); *Commonwealth v. Gibson*, 19 A.3d 512, 519 (Pa. 2011); *Keough v. State*, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937, at 36 (Tenn. Crim. App. June 30, 2010).

258. See *Detrich v. Ryan*, 619 F.3d 1038, 1063 (9th Cir. 2010); *Williams*, 612 F.3d at 945; *Hamilton v. Ayers*, 583 F.3d 1100, 1127-28 (9th Cir. 2009); *Hawkins v. Wong*, No. CIV S-96-1155 MCE EFB DP, 2010 WL 3516399, at *91 (E.D. Cal. Sept. 2, 2010); *Morris v. Malfi*, No. 06-7409 SI, 2010 WL 2629738, at *7 (N.D. Cal. June 29, 2010); *Creech*, 2010 WL 1338126, at 10; *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *25 (N.D. Miss. Feb. 19, 2010); *Henry v. Ryan*, No. CV 02-656-PHX-SRB, 2009 WL 692356, at *65 (D. Ariz. Mar. 17, 2009); *Hall v. Quarterman*, No. 4:06-CV-436-A, 2009 WL 612559, at *33, *39-40 (N.D. Tex. Mar. 9, 2009); *Woodall v. Simpson*, No. 5:06CV-P216-R, 2009 WL 464939, at *43 (W.D. Ky. Feb. 24, 2009); *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010); *Brant v. State*, 21 So. 3d 1276, 1281 (Fla. 2009); *Commonwealth v. Williams*, No. 200001876, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6 (Pa. Cnty. Ct. May 13, 2010).

dependency, that defendant also presented evidence of a genetic predisposition to other conditions. Regardless, the alcohol/substance abuse claim is pervasive and far more substantial when compared to this Author's study of pre-2007 cases.²⁵⁹ It appears attorneys are more willing to submit such evidence, perhaps because the science of addiction has progressed so rapidly.

Apart from the particular type of behavioral genetics evidence, however, there are varying ways defendants offer such evidence and courts either accept or reject it. For example, *Schurz v. Schriro*²⁶⁰ concerned evidence involving three of Chart 5's categories: substance dependency, alcohol dependency, and family dysfunction.²⁶¹ In *Schurz*, the defendant offered evidence that his counsel should have investigated and presented the following areas of mitigation: a genetic predisposition toward addiction and mental illness; possible fetal alcohol syndrome; a history of alcoholism among family members, including his mother, father, grandfather, grandmother, and aunts and uncles; serious and ongoing parental neglect, chronic alcohol and substance abuse, and physical neglect.²⁶² In its evaluation of the merits of the defendant's claim, the court conceded to the dysfunctionality of the defendant's "home environment"; it noted that as a youth the defendant was forced to experience "his family's alcoholism, verbal and physical abuse, which was at times severe, lack of nurturing from his parents, and family fights and violence."²⁶³ Yet the district court still denied habeas relief, predicting that "the sentencing court would have assigned minimal significance to the new declarations providing additional detail about Petitioner's dysfunctional family history."²⁶⁴

Whether courts treat evidence of a defendant's mental retardation any differently remains to be fully seen until a larger sample of cases evolves. Regardless, as mentioned previously, there were three cases in this Study where counsel introduced genetics evidence for the purpose of contending that the defendant was mentally retarded and therefore ineligible for the death penalty under *Atkins v. Virginia*.²⁶⁵ One of the three courts agreed with that argument.²⁶⁶

Overall, most courts accepted the evidence that defendants offered, even when that evidence could be viewed as controversial or potentially

259. See *Behavioral Genetics Evidence*, *supra* note 19, at 321, 465-98.

260. No. CV-97-580-PHX-EHC, 2007 WL 2808220 (D. Ariz. Sept. 25, 2007).

261. See *infra* Chart 5.

262. *Schurz*, 2007 WL 2808220, at *41.

263. *Id.* at *48.

264. *Id.* at *49.

265. 536 U.S. 304 (2002); see also *supra* notes 196-98 and accompanying text (discussing the three cases).

266. *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at * 15 (Pa. D. & C. May 13, 2010).

stigmatizing. In *Morales v. Mitchell*,²⁶⁷ for example, the Sixth Circuit affirmed the district court's finding that the defendant's counsel was ineffective because the counsel had failed to conduct an adequate investigation of potentially mitigating evidence.²⁶⁸ That search would have revealed the defendant's extensive family history of alcoholism, the defendant's own alcoholism and how it affected him (such as being prone to blackouts), his upbringing (alcoholic and absent parents, and a mentally retarded brother), as well as "[t]he role of alcohol in the Native American Indian culture in which he was raised."²⁶⁹ The defendant's parents, grandparents, uncle, and aunts were alcoholics, and several relatives died from cirrhosis of the liver.²⁷⁰ All of this information was positively influential in terms of mitigation. The defendant was entitled to a writ of habeas corpus, and his death sentence was vacated.²⁷¹

Chart 5 also lists categories that could potentially be considered as aggravating at first glance but, within a proper context, could serve as mitigation.²⁷² In *Creech v. Hardison*,²⁷³ for example, the defendant, Creech, claimed ineffective assistance of counsel at his resentencing hearing due to his counsel's inadequate research on mitigation evidence.²⁷⁴ According to a psychologist who testified at Creech's resentencing hearing, Creech "probably had a genetic or biological predisposition for violence" based on the psychologist's examination of records, mental health reports, an interview with Creech, and the results of various psychological tests.²⁷⁵ The psychologist also concluded "that Creech had an antisocial personality and scored in the 96th percentile of the prison population for psychopathy."²⁷⁶ This information was used as mitigating evidence during the sentencing hearing for Creech's murder of his fellow inmate.²⁷⁷ On appeal, Creech also introduced new evidence from a 2005 neurological examination, showing that he had "bilateral brain damage that affected [his] insight, judgment and capacity to exercise social inhibitions."²⁷⁸ After reviewing the record, however, the court found that "the state district court expressly considered the various mitigating circumstances."²⁷⁹ While "[a] neurologist's opinion that Creech

267. 507 F.3d 916 (6th Cir. 2007).

268. *Id.* at 928-31.

269. *Id.* at 931.

270. *Id.* at 932.

271. *Id.* at 942.

272. *See infra* Chart 5.

273. No. CV 99-0224-S-BLW, 2010 WL 1338126 (D. Idaho Mar. 31, 2010).

274. *Id.* at *10.

275. *Id.*

276. *Id.*

277. *Id.*

278. *Id.* at *14 (citations omitted).

279. *Id.*

has brain damage may be more specific than [the psychologist's] testimony," it offered "only a modest counterweight" to the aggravating factors involved in Creech's case; these factors included Creech's long criminal record as well as the "brutal manner" in which he killed a more vulnerable fellow inmate "over a petty dispute."²⁸⁰

*Brant v. State*²⁸¹ is notable both because it is the only case that concerned sexual sadism and because behavioral genetics evidence was mentioned in passing during the trial.²⁸² According to a forensic psychiatrist for the defense, Brant suffered from sexual sadism which "in most cases . . . arises out of a genetic predisposition and unhealthy childhood environment."²⁸³ Concerning the sexual battery involved in the case, the psychiatrist stated that Brant possessed "a substantial impairment in his ability to conform his conduct with the requirements of the law" because of both his sexual sadism and the effects of methamphetamine.²⁸⁴ The underlying sexual disorder which hindered Brant's ability to control his sexual impulses was exacerbated when he ingested drugs.²⁸⁵ In addition, a PET scan of Brant's brain indicated "underactivity" in the areas associated with impulse control and good judgment.²⁸⁶ Nevertheless, the Florida Supreme Court affirmed Brant's death sentence,²⁸⁷ unconvinced that the mitigating evidence outweighed the aggravating evidence.²⁸⁸ At the same time, the court did not throw doubt on the validity of the behavioral genetics evidence, nor turn it into a vehicle for aggravation.

III. THE STATE OF BEHAVIORAL GENETICS EVIDENCE NOW

This Part has two goals: it discusses this Author's Study of thirty-three behavioral genetics evidence cases in more depth and it compares the Study to the results of this Author's prior research on forty-eight behavioral genetics evidence cases decided between 1994-2007. This comparison is made by way of addressing a series of questions about the findings and then the overall impact of behavioral genetics evidence.

280. *Id.* at *15.

281. 21 So. 3d 1276 (Fla. 2009).

282. *Id.* at 1282.

283. *Id.*

284. *Id.* at 1283.

285. *Id.*

286. *Id.* at 1281.

287. *Id.* at 1289.

288. *Id.* at 1286.

A. Are Courts Still Skeptical?

1. *The First Study: 1994-2007*

In 1994, defense preparations for *Mobley v. State*²⁸⁹ drew world-wide publicity because of Mobley's counsel's unprecedented efforts to gather behavioral genetics evidence to prevent Stephen Mobley's execution.²⁹⁰ According to some commentators at the time, the availability of such testing would prompt political and moral abuses of highly controversial information.²⁹¹ Yet this Author's earlier survey of the forty-eight cases that had used behavioral genetics evidence during the thirteen years following *Mobley* (1994-2007) showed no apparent basis for these concerns.²⁹² There were no abuses of the ilk that had been predicted and most courts still questioned the relevance of such evidence when attorneys attempted to introduce it at the penalty phase, a tact consistent with the Supreme Court's 2007 conclusions in *Schiro v. Landrigan*.²⁹³

In essence, during the thirteen years between *Mobley* and *Landrigan*, there had been seemingly few changes in social and legal attitudes toward behavioral genetics.²⁹⁴ The topic remained controversial for many of the same reasons espoused at the 1992 University of Maryland conference.²⁹⁵ Moreover, the applicability of behavioral genetics evidence as mitigation in death penalty cases still seemed to baffle the press and public, thereby accentuating the controversy.²⁹⁶

There were exceptions, of course, as the Susan Smith case illustrated. In *Von Dohlen v. State*,²⁹⁷ for example, which was decided a decade after *Mobley*, the court remanded the defendant's case for resentencing in light of the mitigating evidence that attorneys presented, which had included behavioral genetics factors.²⁹⁸ Notably, such evidence was sufficiently compelling even without a testifying expert documenting the defendant's genetic proclivity for mental disorder or other troublesome conditions.²⁹⁹ The passage of time may have been a positive influence on *Von Dohlen*'s outcome, although such an explanation is speculative. Regardless, the case remains unusual when compared to a larger group of opinions that have viewed behav-

289. 455 S.E.2d 61 (Ga. 1995).

290. See *Behavioral Genetics Evidence*, *supra* note 19, at 319.

291. *Id.* at 349.

292. *Id.* at 321.

293. *Id.* at 350 (citing *Schiro v. Landrigan*, 550 U.S. 465, 480-81 (2007)).

294. *Id.* at 324.

295. *Id.* at 350; see also *supra* note 108 and accompanying text.

296. See *Behavioral Genetics Evidence*, *supra* note 19, at 350.

297. 602 S.E.2d 738 (S.C. 2004).

298. *Id.* at 743.

299. *Id.* at 741-46.

ioral genetics evidence either as inconsequential or, on a far lesser scale, potentially predictive of a defendant's future violent tendencies.³⁰⁰

Consistent with *Mobley*³⁰¹ and *Landrigan*,³⁰² this Author's earlier study showed that courts articulated five major reasons for rejecting a defendant's submission of behavioral genetics evidence:³⁰³ (1) The mitigation evidence the defense had already submitted was sufficient and further information concerning the defendant's genetic attributes would most likely not have influenced the defendant's sentence; (2) behavioral genetics evidence is not as valid and reliable relative to other evidence introduced at trial, especially when there is conflicting testimony among the experts; (3) an association between a defendant's behavioral genetics and criminal behavior is "unorthodox" or "exotic"; (4) even if behavioral genetics evidence is accepted at trial, it can be detrimental to a defendant's case because it indicates that the defendant will commit further acts of violence and be a danger to society; and (5) behavioral genetics evidence collides with some courts' views of criminal responsibility, which may favor safeguarding the community rather than rehabilitation.³⁰⁴

This Author's studies provide little support for any of these five rationales. For example, both studies have shown that behavioral genetics evidence can have a beneficial impact for some defendants in some cases, particularly when it bolsters or interacts with other kinds of mitigating evidence.³⁰⁵ There are also compelling arguments that behavioral genetics evidence is relevant and useful if applied in a limited way, such as to buttress other mitigating conditions,³⁰⁶ or to verify the existence of a condition that a court may question.³⁰⁷ Likewise, courts' rendering of behavioral genetic factors as "unorthodox" or "exotic" ignores the reality that such information

300. See *Behavioral Genetics Evidence*, *supra* note 19, at 349-51; see also *supra* notes 192, 201 and accompanying text (discussing the small number of cases concerning a defendant's future dangerousness that were reported in this Author's pre-2007 study).

301. *Turpin v. Mobley*, 502 S.E.2d 458, 461 (Ga. 1998).

302. *Schriro v. Landrigan*, 550 U.S. 465, 480-81 (2007).

303. See *Behavioral Genetics Evidence*, *supra* note 19, at 350.

304. *Id.* at 351-52.

305. *Id.* at 352 (discussing the five stated problems concerning the use of behavioral genetics evidence in criminal cases). Indeed, similar to some brain imaging technologies, some behavioral genetics evidence may be more scientifically reliable than many other kinds of evidence admitted into trial. For a discussion of this perspective in the context of brain imaging see Adam Teitcher, *Weaving Functional Brain Imaging into the Tapestry of Evidence: A Case for Functional Neuroimaging in Federal Criminal Courts*, 80 *FORDHAM L. REV.* 355 (2011).

306. See *Behavioral Genetics Evidence*, *supra* note 19, at 333 (listing the ways that behavioral genetics evidence validates the existence of a serious condition).

307. See *Billiot v. State*, 655 So. 2d 1, 8 (Miss. 1995); *Alley v. State*, 958 S.W.2d 138, 142 (Tenn. Crim. App. 1997).

has a long history in legal cases,³⁰⁸ even if that past was controversial or seemingly forgotten by more recent decisions, such as *Mobley*³⁰⁹ and *Landrigan*.³¹⁰ Indeed, this Author's research uncovered eighty-one such cases over the past seventeen years.

The remaining rationales also lack support. While courts and commentators have long-stressed the double-edged-sword aspect of behavioral genetics evidence, this characteristic is inherent to many other mitigating factors. The Supreme Court's reliance on certain kinds of neuroscientific findings in *Roper v. Simmons*³¹¹ is an apt illustration. In *Roper*, the Supreme Court held that the Eighth and Fourteenth Amendments prohibited the execution of persons under age eighteen at the time their crimes were committed.³¹² The Court reasoned that relative to adults, juveniles are more immature and irresponsible, vulnerable to negative pressures from their peers and environment, and fragile and unstable in their identities.³¹³ Although these disparities explained why juveniles may be less culpable, they also heightened the likelihood that juveniles would engage in impulsive thinking and criminality.³¹⁴ The very factors that argued against juveniles' eligibility for the death penalty also made them more prone to misconduct—truly a double-edged sword. Likewise, the argument that behavioral genetics evidence conflicts with some courts' theories of criminal responsibility again reveals the confusion concerning the disparate standards relevant for the guilt-or-innocence phase of a trial as opposed to the penalty phase of a trial. The standard for mitigation evidence is far broader given the purpose that it serves.³¹⁵

Another aspect complicating these already difficult cases involves the apparent ignorance of some courts in dealing with the interactions among social, biological, and genetic variables. As this Article has shown, however, such variables are so intertwined it would be an artificial and misleading process to attempt to separate them for purposes of sentencing.³¹⁶ Yet, the latest discoveries in behavioral genetics have not fallen on courts' deaf ears in more recent times. Indeed, the next Section's discussion of cases using

308. See *Behavioral Genetics Evidence*, *supra* note 19, at 352.

309. 455 S.E.2d 61, 65-66 (Ga. 1995).

310. *Schriro v. Landrigan*, 550 U.S. 465, 480-81 (2007).

311. 543 U.S. 551 (2005).

312. *Id.* at 578 ("The Eighth and Fourteenth Amendments forbid imposition of the death penalty on offenders who were under the age of 18 when their crimes were committed."); see also *Graham v. Florida*, 130 S. Ct. 2011, 2034 (2010) (holding that "[t]he Constitution prohibits the imposition of a life without parole sentence on a juvenile offender who did not commit homicide").

313. *Roper*, 543 U.S. at 569-70.

314. *Id.* at 570-71.

315. See *supra* Section I.A.

316. See *supra* notes 22-27 and accompanying text.

behavioral genetics evidence during the last four years suggests that much of this judicial skepticism has ebbed if not disappeared entirely.³¹⁷

2. *The Second Study: 2007-2011*

Courts during 2007-2011 seemingly quelled questioning whether sound behavioral genetics evidence should be admitted as mitigation at all during the penalty phase. Rather, the question now is whether sufficient evidence has been presented and, if so, how much weight it should be given. In all thirty-three of the decisions this Author examined, for example, courts appeared to at least consider behavioral genetics evidence in their analysis of mitigating factors and whether an attorney has rendered ineffective assistance. Likewise, none of the courts squarely rejected the introduction of behavioral genetics evidence nor referred to it as “exotic” or “unorthodox.”

Courts’ views of the weight such evidence should have take a variety of forms and, unsurprisingly, rely on case specific facts. Even when courts did not find that behavioral genetics evidence was likely to affect the outcome of the case or was outweighed by aggravating factors, they still addressed and acknowledged family history. Particularly striking over the last four years were arguments concerning defendants’ genetic proclivities to alcohol and substance abuse—a far larger percentage than had previously been found.³¹⁸ Again, regardless of whether such evidence positively affected the outcome of the defendant’s sentence, courts did take it into account in the same way they would other kinds of mitigating evidence. According to the court in *Rhoades v. Henry*,³¹⁹ for example, the evaluations of two experts indicating that Rhoades likely has a genetic predisposition to serious disorders were not sufficiently strong to shed light on Rhoades’s mental and emotional states of mind at the time he committed the murders.³²⁰ One expert stated that alcoholism and suicides in Rhoades’s family “very likely” indicated a genetic factor in his mental health.³²¹ Another expert concluded that Rhoades “inherited the diseases of alcoholism and drug abuse” and that he was “born into a family that suffered from major mental illness and neuropsychological impairment.”³²² Yet the court viewed the reports of both experts to be “speculative” and “indeterminate,” concluding that the aggravating factors in Rhoades’s case outweighed the mitigating factors.³²³ The district court and the Ninth Circuit also considered the reports of the experts

317. See *infra* Subsection III.A.2.

318. See *supra* Section II.C.

319. 638 F.3d 1027 (9th Cir. 2011).

320. *Id.* at 1050, 1052.

321. *Id.* at 1048.

322. *Id.*

323. *Id.* at 1050-51.

in their analysis of Rhoades's claim, and both courts viewed the information in the same way.³²⁴ As such evidence becomes more sophisticated, the analytical tilt may change.

These kinds of balances are perhaps most intricately assessed in cases (previously discussed) where defendants have a proclivity for criminal conduct in unsympathetic circumstances. In *Creech v. Hardison*,³²⁵ for example, the defendant, while serving a life sentence for murder, murdered another prisoner by hitting him with a battery-filled sock and stomping on his head and neck.³²⁶ The state court considered both aggravating and mitigating factors, such as the defendant's young age (mitigating), genetic or biological predisposition for violence (mitigating), and the nature of the crime (highly aggravating)—holding that the aggravating factors outweighed the mitigating factors,³²⁷ a conclusion the district court endorsed.³²⁸ The court found that the sentence would have been the same even with (among other factors) the “possibility of a biological predisposition . . . listed as a mitigating factor.”³²⁹ Likewise, in *Schurz v. Schriro*,³³⁰ the defendant—facing the death sentence for murder after splashing the victim with gasoline and setting him on fire—claimed on appeal that several mitigation factors should have been presented at his sentencing hearing.³³¹ These mitigators included a genetic predisposition toward addiction and mental illness, exposure to neurotoxins, as well as a family life of violence and crime.³³² The *Schurz* court acknowledged all these influences;³³³ yet, it concluded, like the court in *Creech*, that the defendant did not show these factors affected his ability to control, comprehend, or perceive his actions at the time of the murder and that the outcome in the sentencing court would have been the same.³³⁴ The court in *Brant v. State*³³⁵ similarly affirmed the defendant's death sentence, unconvinced that the mitigating evidence (genetic predisposition to sexual sadism, unhealthy childhood environment, family history of depression, and drug use) outweighed the aggravating evidence (premeditation and attempts to cover up the crime, and calm demeanor after the crime).³³⁶ Brant's impair-

324. *Id.* at 1050.

325. No. CV 99-0224-S-BLW, 2010 WL 1338126 (D. Idaho Mar. 31, 2010).

326. *Id.* at *1.

327. *Id.* at *3.

328. *Id.* at *10.

329. *Id.* at *11.

330. No. CV-97-580-PHX-EHC, 2007 WL 2808220 (D. Ariz. Sept. 25, 2007).

331. *Id.* at *1-2.

332. *Id.* at *43.

333. *Id.* at *48-49.

334. *Id.*

335. 21 So. 3d 1276 (Fla. 2009).

336. *Id.* at 1286.

ment due to abnormal brain functioning and drug use, while mitigating, was “not so mitigating as to make his death sentence disproportionate.”³³⁷

Even in cases where defendants’ propensities for violence are not as marked, many courts remain unpersuaded by behavioral genetics evidence of substance abuse. Yet, again, the important point here is that the courts accept the validity of the evidence irrespective of whether it affects their decision about the sentence. In *Keough v. State*,³³⁸ for example, the defendant introduced evidence at his post-conviction hearing regarding a family history of alcoholism.³³⁹ However, the defendant’s convictions and death sentence were affirmed by the Court of Criminal Appeals on the basis that further investigation into his chronic alcoholism would have done little to change the outcome of the case; the jury had already heard testimony about the defendant’s alcohol use on the night of the murder and had already rejected a defense theory of voluntary intoxication.³⁴⁰ In *Commonwealth v. Gibson*³⁴¹ the court similarly concluded that the new mitigation evidence presented by the defendant, which included a family history of alcohol abuse spanning at least three generations, was not reasonably likely to have swayed a juror to alter his or her vote.³⁴² Thus, the court denied the defendant’s petition for post-conviction relief.³⁴³

Other courts in the last four years have tended to give behavioral genetics evidence (including alcohol or substance abuse) more weight—some to the point of considering it an error not to have a pretrial hearing on a defendant’s genetic predisposition; others have made it grounds for vacating a death sentence. In *Hawkins v. Wong*,³⁴⁴ for instance, the court allowed an evidentiary hearing on the defendant’s ineffective assistance of counsel claim,³⁴⁵ part of which concerned the failure to investigate and present mitigating evidence, including the defendant’s genetic predisposition to alcoholism and mental illness.³⁴⁶ According to the defendant, the mitigating evidence omitted by counsel would have shown that the defendant was born “into a family marked by extreme pathology and dysfunction over multiple generations.”³⁴⁷ In *Morales v. Mitchell*,³⁴⁸ the court conclusively held that

337. *Id.* at 1287.

338. No. W2008-01916-CCA-R3-PD, 2010 WL 2612937 (Tenn. Crim. App. June 30, 2010).

339. *Id.* at *13.

340. *Id.* at *23.

341. 19 A.3d 512 (Pa. 2011).

342. *Id.* at 519, 531.

343. *Id.* at 531.

344. No. CIV S-96-1155 MCE EFB DP, 2010 WL 3516399 (E.D. Cal. Sept. 2, 2010).

345. *Id.* at *86, *92.

346. *Id.* at *89.

347. *Id.*

348. 507 F.3d 916 (6th Cir. 2007).

defense counsel rendered ineffective assistance for failing to conduct an investigation into mitigating evidence—information that primarily consisted of alcoholism in Morales’s family, Morales’s own alcoholism and its effects on him, as well as his family upbringing.³⁴⁹ The district court in *Allison v. Cullen*³⁵⁰ also vacated the defendant’s death sentence and granted relief on his claim of ineffective assistance of counsel for his counsel’s failure to present mitigating evidence.³⁵¹ This evidence included expert statements that the defendant might have a genetic predisposition to alcoholism, substance abuse, and mental illness.³⁵² Lastly, in *Hall v. McPherson*,³⁵³ the Supreme Court of Georgia upheld the habeas court’s vacation of McPherson’s death sentence. According to the court, the defendant’s trial counsel should have investigated further into McPherson’s background, which included a family tree showing a genetic predisposition to substance abuse disorder; failure to do so was due to inattention, rather than to a strategic decision.³⁵⁴

B. Is Behavioral Genetics Evidence Effective?

One way to try to measure the potential effectiveness of behavioral genetics evidence in criminal cases is to provide a thorough sense of how the evidence is being used. In most of the thirty-three cases in this Author’s Study, at least one of the defendants’ claims alleged ineffective assistance of counsel for counsel’s failure to adequately investigate or present mitigating evidence of behavioral genetic factors.³⁵⁵ *Morales v. Mitchell*³⁵⁶ is one

349. *Id.* at 931, 936.

350. No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957 (C.D. Cal. July 22, 2010).

351. *Id.* at *120-21, *177.

352. *Id.* at *133, *169.

353. 663 S.E.2d 659 (Ga. 2008).

354. *Id.* at 662, 667, 670.

355. See *Morales v. Mitchell*, 507 F.3d 917, 931 (6th Cir. 2007) (holding that defense counsel was ineffective for failing to adequately investigate the impact of defendant’s cultural background as well as the cause of defendant’s mental and emotional deficiencies during his lifelong alcohol consumption); *Hawkins v. Wong*, No. CIV S-96-1155 MCE EFB DP, 2010 WL 3516399, at *86, *89 (E.D. Cal. Sept. 2, 2010) (concluding that counsel failed to organize the case around themes supported by the mitigating evidence, and failed to investigate and present mitigating evidence that defendant was genetically predisposed to alcoholism and mental illness); *Turner v. Epps*, No. 4:07CV77-WAP, 2010 WL 653880, at *10-13 (N.D. Miss. Feb. 19, 2010) (claiming that counsel was ineffective for failing to investigate or present evidence of defendant’s traumatic childhood upbringing, his depressive disorders, a family history of mental illness, and a genetic predisposition to mental illness); *Woodall v. Simpson*, No. 5:06CV-P216-R, 2009 WL 464939, at *45, *48-49 (W.D. Ky. Feb. 24, 2009) (contending that counsel was ineffective for failing to present a genetic defect defense, to obtain additional neurological testing for defendant, and to link defendant’s mental condition to his genetic history).

356. 507 F.3d 917 (6th Cir. 2007).

case where counsel's failure to present this evidence was on strong ground. Morales was a Native American man with a family history of alcoholism.³⁵⁷ During the penalty phase of his case, the only evidence presented was the defendant's unsworn statement. On appeal, the Sixth Circuit found that counsel's failure to present any mitigation evidence constituted deficient performance.³⁵⁸ Among the points that the court agreed should have been raised by trial counsel during the penalty phase was the defendant's "chaotic and dysfunctional family environment" and "[t]he role of alcohol in the Native American Indian culture" in which the defendant lived.³⁵⁹ The court found persuasive the "volume and compelling nature" of the evidence of Morales's "tumultuous life, continued and uncontrolled alcohol and drug abuse, dysfunctional family history, potential mental health problems, and detailed cultural background"; thus, there was a "reasonable probability that effective counsel could have achieved a different outcome."³⁶⁰

In *Hamilton v. Ayers*,³⁶¹ the Ninth Circuit also seemed to suggest that counsel's failure to include behavioral genetics evidence was an influential argument for claiming ineffective assistance.³⁶² Hamilton was facing the death penalty and petitioned for a writ of habeas corpus based on his claim that he was incompetent to stand trial and that his counsel had not thoroughly investigated his mental state.³⁶³ The district court rejected Hamilton's petition despite expert testimony that Hamilton had a family history of genetic disorders and a traumatic upbringing.³⁶⁴ In a 2009 appeal to the Ninth Circuit, the court remanded the case, with instructions to reduce Hamilton's death sentence to life imprisonment without parole.³⁶⁵ The court found that Hamilton's counsel was deficient for failing to investigate and present mitigating evidence, such as documentation of Hamilton's mental health history.³⁶⁶ Among the mitigation information that should have been submitted was a family history of depression and mental health issues, including indications that Hamilton's parents and extended family suffered from depression and suicidal thoughts, and his paternal great-grandmother and cousin committed suicide.³⁶⁷ In addition, one expert who testified at Hamilton's habeas hearing stated that Hamilton "was raised in an environment of inter-

357. *Id.* at 924, 931-33.
358. *Id.* at 933, 936.
359. *Id.* at 931.
360. *Id.* at 935.
361. 583 F.3d 1100 (9th Cir. 2009).
362. *Id.* at 1126-29.
363. *Id.* at 1102.
364. *Id.* at 1105.
365. *Id.* at 1136.
366. *Id.* at 1135-36.
367. *Id.* at 1127-28.

generational alcoholism.”³⁶⁸ Given the new evidence, the court concluded that Hamilton’s trial counsel’s investigation “fell far below the constitutional floor” and was prejudicial.³⁶⁹

Success in this arena depends on a wide range of factors. In other recent appeals, courts have not given behavioral genetics evidence as much weight. In 2010, the same court of appeals that vacated Hamilton’s death sentence, affirmed a denial of habeas for another defendant’s guilt phase and reversed the district court’s grant of habeas relief as to the penalty phase.³⁷⁰ In *Mickey v. Ayers*,³⁷¹ the district court agreed that the defendant’s counsel could have made a successful mitigation case with evidence that the defendant’s genetic propensities, when combined with his family upbringing and mental illness, caused him to be predisposed to alcohol and drug dependency.³⁷² On appeal, however, the Ninth Circuit found that the second penalty phase expert’s research into genetic links of certain diseases was in a nascent stage at the time of trial; therefore, the defendant’s counsel was not deficient in failing to provide the expert with the defendant’s family history of substance abuse.³⁷³

In general, both of this Author’s studies show that, as would be expected, counsel’s failure to present behavioral genetics evidence alone was often not enough to constitute ineffective assistance. But, when coupled with other factors, courts were less reluctant to grant evidentiary hearings or to vacate death sentences altogether for ineffective assistance.

C. Are There New Trends or Arguments?

This Article reports a number of new trends and arguments since 2007. The first trend concerns the changed role of behavioral genetics evidence in criminal cases. In this Author’s original study of forty-eight cases, most cases employed behavioral genetics evidence in three primary ways: (1) to support a claim of ineffective assistance of counsel, (2) to provide proof and diagnosis of a defendant’s mitigating condition, and/or (3) to indicate some likelihood of the defendant’s future dangerousness.³⁷⁴ This Author’s most recent study of thirty-three cases showed, however, that there was no third category and that no case applied behavioral genetics evidence to predict the defendant’s dangerousness.³⁷⁵ Nor was the evidence ever used

368. *Id.* at 1128.

369. *Id.* at 1129-31.

370. *Mickey v. Ayers*, 606 F.3d 1223, 1249 (9th Cir. 2010).

371. *Id.*

372. *Id.* at 1240.

373. *Id.* at 1247.

374. *See supra* notes 189-91 and accompanying text.

375. *See infra* Chart 2.

by the prosecution, much less as an aggravating factor.³⁷⁶ While this Author's original study did not report many cases in which the evidence was implemented detrimentally, the discovery that it has never been so used in the last four years is startling. After all, this finding contradicts the Supreme Court's view in *Landrigan* that such evidence could be submitted to enhance the perception of a defendant's level of dangerousness.³⁷⁷

Second, in light of the Court's 2002 decision in *Atkins v. Virginia*,³⁷⁸ behavioral genetics evidence now may play a larger role in defendants claiming a genetic predisposition to mental retardation³⁷⁹ and mental incompetence.³⁸⁰ In *Ex parte Smith*,³⁸¹ for example, Smith tried to argue that he was mentally retarded and not eligible for the death penalty.³⁸² Smith stated that he had a genetic predisposition to mental retardation and that five of his family members suffered from the same mental infirmity.³⁸³ However, in an *Atkins* hearing, the court determined that Smith was not mentally retarded because he had failed to demonstrate substantial or significant deficits in adaptive behavior, either at the time of the murders or before the hearing.³⁸⁴ There was a different outcome in *Commonwealth v. Williams*.³⁸⁵ In *Williams*, the issue also was whether the defendant was mentally retarded and therefore ineligible for the death penalty. An expert stated that the defendant was born with "some genetic predisposition to mental retardation," and he had closed-head injuries as a child due to abuse.³⁸⁶ The court evaluated the expert opinions and determined that Williams was mentally retarded and therefore ineligible for the death penalty.³⁸⁷

In *Morris v. Malfi*,³⁸⁸ the defendant claimed that his due process rights were violated because he was tried and adjudicated while mentally incompetent.³⁸⁹ During the penalty phase of his trial, Morris submitted evidence of

376. See *supra* notes 192-93, 201 and accompanying text.

377. *Schiro v. Landrigan*, 550 U.S. 465, 480-81 (2007).

378. 536 U.S. 304 (2002).

379. See *Hall v. Quarterman*, No. 4:06-CV-436-A, 2009 WL 612559, at *33, *40 (N.D. Tex. Mar. 9, 2009); *Ex parte Smith*, No. 1080973, 2010 WL 4148528, at *4 (Ala. Oct. 22, 2010); *Commonwealth v. Williams*, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *6 (Pa. D. & C. May 13, 2010).

380. See *Morris v. Malfi*, No. C 06-7409 SI, 2010 WL 2629738, *11, *16 (N.D. Cal. June 29, 2010), *aff'd*, 449 F. App'x 686 (9th Cir. 2011).

381. No. 1080973, 2010 WL 4148528 (Ala. Oct. 22, 2010).

382. *Id.* at *1.

383. *Id.* at *4.

384. *Id.* at *7.

385. 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *3.

386. *Id.* at *6.

387. *Id.* at *13-14.

388. No. C 06-7409 SI, 2010 WL 2629738 (N.D. Cal. June 29, 2010), *aff'd*, 449 F. App'x 686 (9th Cir. 2011).

389. *Id.* at *10.

head injuries, including two in the frontal part of his brain, the area that controls emotions, impulses, and inhibition of behavior.³⁹⁰ Morris also submitted a 2009 evaluation and report by Dr. Natasha Khazanov, a clinical psychologist.³⁹¹ Dr. Khazanov reviewed and evaluated psychological and medical records pertaining to Morris's head traumas, criminal cases, and family medical and psychiatric history, as well as conducted neuropsychological testing on him.³⁹² In her report, Dr. Khazanov stated, among other things, that Morris had a genetic predisposition to chronic psychopathology, specifically paranoid schizophrenia.³⁹³

As this Article previously mentioned, the Author's 2007-2011 Study also revealed more cases in which courts incorporated behavioral genetics evidence to support defendants' claims of the inheritance of alcohol and drug dependency.³⁹⁴ This trend was particularly pronounced relative to other kinds of factors. Regardless, as these results make clear, courts seemingly no longer view any type of scientifically accepted behavioral genetics evidence as "exotic" in the same way that *Landrigan* did.³⁹⁵ Nor is there any overt indication that behavioral genetics evidence has reinforced concerns expressed in the context of *Mobley*, most particularly worries that actors in the criminal justice system would increasingly and irresponsibly rely on distorted information in their decision making.³⁹⁶

Indeed, as this Author has previously contended,³⁹⁷ concerns over behavioral genetics evidence in criminal cases can be a red herring, deflecting attention from the realization that courts can genetically stereotype defendants irrespective of any attempt made by those defendants to submit genetics arguments. While no such case was found in this Author's most recent Study, the Author did find such a case in the prior study. In *State v. Madey*,³⁹⁸ the defendant, who pled guilty to misdemeanor assault after two police officers tried to take her into protective custody for public intoxication,³⁹⁹ challenged the court's probation requirements, one of which mandated that she write an essay on "alcoholism and the American Indians."⁴⁰⁰ The requirements were also made in the context of the court's numerous and unsubstantiated comments about Madey's ethnic proclivity for alcohol-

390. *Id.* at *5.

391. *Id.* at *9.

392. *Id.*

393. *Id.*

394. *See supra* Subsection II.B.

395. *Landrigan v. Stewart*, 272 F.3d 1221, 1228 (9th Cir. 2001).

396. *See supra* notes 301-15 and accompanying text.

397. *See Behavioral Genetics Evidence, supra* note 19, at 348.

398. No. 81166, 2002 WL 31429827 (Ohio Ct. App. Oct. 31, 2002) (vacating and remanding sentencing decision of the trial court).

399. *Id.* at *1.

400. *Id.* at *2.

ism.⁴⁰¹ These comments included asking Madey's mother whether "she knew 'anything about genetic predisposition to alcoholism?'" or "if she had 'ever been on an Indian Reservation?' and if she had ever seen 'the Scotch or Irish drinking?'"⁴⁰² The court even asked the mother whether she "had a concern that her daughter would become 'a flaming alcoholic' because, with such an ethnic background, 'there [was] nothing she can do about it.'"⁴⁰³ In turn, the court continually speculated about the degree of the defendant's future dangerousness, even characterizing the defendant's potential state of being a murder victim as a danger to others: "[I]f you start drinking like this, you're a danger. You will go out and get yourself attacked, or murdered, or something, . . . and every time somebody is killed or raped in society, that diminishes the public safety overall."⁴⁰⁴ In vacating the defendant's sentence and remanding, the appellate court noted that not only were the trial court's comments completely unrelated "to an interest in doing justice," but that the defendant did not "attempt[] to use her family background to excuse her behavior."⁴⁰⁵

In *Madey*, the genetic stereotyping was in the court's eyes only, a potential cause for concern in any case, no matter the defense or evidentiary circumstances. Yet some courts have not needed a cultural stereotype to use genetics wrongly. In 2011, for example, a three-judge panel of the United States Court of Appeals for the Second Circuit overturned a federal district court's decision to sentence a defendant to six-and-a-half years in a child pornography case because the court had made inappropriate conclusions about genetic proclivities.⁴⁰⁶ In the district court's eyes, the defendant would recidivate and continue viewing child pornography "because of an as-of-yet undiscovered gene."⁴⁰⁷ Such a marker is "'a gene you were born with,'" the court stated to the defendant, "'[a]nd it's not a gene you can get rid of.'"⁴⁰⁸ Rejecting as "'virtually worthless'" the two psychological evaluations that demonstrated the defendant was "at a low to moderate risk to re-offend," the court reiterated to the defendant a genetic prediction:⁴⁰⁹ "'You are what you're born with. And that's the only explanation for what I see here.'"⁴¹⁰ The Second Circuit panel made clear its stance about such an "unsupported

401. *Id.* at *1.

402. *Id.*

403. *Id.*

404. *Id.* at *2.

405. *Id.* at *4.

406. See *U.S. v. Cossey*, 632 F.3d 82, 85, 89 (2d Cir. 2011) ("The judgment of the district court hereby is VACATED and REMANDED for resentencing consistent with this opinion, with instructions to assign the case to a different judge.").

407. *Id.* at 88.

408. *Id.* at 87 (citations omitted).

409. *Id.* (citations omitted).

410. *Id.* (citations omitted).

theory of genetics,⁴¹¹ emphasizing the district court's lack of fairness and integrity and ordering the defendant to be sentenced by a different judge.⁴¹² Such cases emphasize all the more the enhanced need for a measured judiciary.

D. The Potential Impact of *Cullen v. Pinholster*

After *Schriro v. Landrigan*,⁴¹³ *Cullen v. Pinholster*⁴¹⁴ is the only Supreme Court case that has addressed behavioral genetics evidence.⁴¹⁵ Yet, unlike *Landrigan*, *Pinholster* does not focus so much on the type of evidence at issue, but rather on how and when such evidence can be evaluat-

411. *Id.* at 88.

412. *Id.* at 89.

413. 550 U.S. 465 (2007).

414. 131 S. Ct. 1388 (2011).

415. *Pinholster*, 131 S. Ct. at 1388, had a long and complex procedural history before it reached the Supreme Court. On automatic appeal after Scott Lynn Pinholster was convicted of murder and sentenced to death, the Supreme Court of California set aside a redundant "multiple-murder special circumstances" charge and affirmed the conviction otherwise. *People v. Pinholster*, 824 P.2d 571, 617-18 (1992). Pinholster sought two writs of habeas corpus in state court, alleging that his trial counsel (1) failed to adequately investigate and present mitigating evidence during the penalty phase, and (2) did not give all relevant materials to a psychiatrist who diagnosed Pinholster with only a personality disorder at trial. *See Pinholster v. Ayers*, 525 F.3d 742, 748 (9th Cir. 2008) (stating that the second state court writ containing the second claim was filed after the federal court found it to be an unexhausted claim in a federal habeas corpus petition). The California Supreme Court summarily denied both petitions and Pinholster subsequently filed a federal habeas petition with the same two claims and requesting an evidentiary hearing. *See Id.* The district court granted habeas relief on Pinholster's death sentence, denied an evidentiary hearing on the guilt phase ineffective assistance claim, and granted an evidentiary hearing on the penalty phase claim. *Pinholster v. Ayers*, 590 F.3d 651, 660 (9th Cir. 2009). The Ninth Circuit reversed the grant of habeas relief and affirmed the hearing, *Pinholster v. Ayers*, 525 F.3d at 748-49, 773, but then vacated the opinion and affirmed the grant of habeas relief on a rehearing en banc, *Pinholster v. Ayers*, 590 F.3d at 655. The Ninth Circuit found that defense counsel's failure to investigate the defendant's background for mitigating evidence to present during the penalty phase was deficient and prejudicial to Pinholster's defense. The court then held that, as a result, the California Supreme Court's summary denial of relief contravened *Strickland v. Washington*, 466 U.S. 668 (1984). *Pinholster v. Ayers*, 590 F.3d at 675-85. The Supreme Court granted certiorari. In a 5-4 decision, the Court reversed the grant of habeas corpus. *Cullen v. Pinholster*, 131 S. Ct. 1388, 1411 (2011). Justice Thomas delivered the opinion of the Court, joined in full by Chief Justice Roberts, Justice Scalia, and Justice Kennedy. Justice Ginsburg and Justice Kagan joined only Part II of the majority opinion. *Id.* at 1394. Justice Alito joined all but Part II. *See id.* at 1411-12 (Alito, J., concurring in part and concurring in the judgment). Justice Breyer joined Parts I and II. *See id.* at 1412-13 (Breyer, J., concurring in part and dissenting in part). Justice Sotomayor dissented, and Justice Ginsburg and Justice Kagan joined Part II of her dissenting opinion. *See id.* at 1413-36 (Sotomayor, J., dissenting). For a recent discussion of *Pinholster*, see Samuel R. Wiseman, *Habeas After Pinholster*, 53 B.C. L. REV. 1 (2012).

ed.⁴¹⁶ It is seemingly irrelevant that the evidence happened to include behavioral genetics factors. Thus, while *Pinholster* is a significant and complicated case, this Section's overview is confined specifically to the issues at hand.

Pinholster is pertinent to this Article's discussion for two reasons. First, the case's complex procedural history is an all-too-classic example of a prisoner's extraordinary challenges with an ineffective assistance of counsel claim.⁴¹⁷ Second, the *Pinholster* Court's holding could substantially impact currently-pending behavioral genetics cases (including those examined in this Article), as well as future cases involving behavioral genetics evidence.⁴¹⁸ Before *Pinholster*, for example, federal habeas courts could hold hearings and evaluate new evidence when they reviewed how state courts construed federal law under AEDPA.⁴¹⁹ State prisoners who had been unable to adequately present their claims in state court could seek habeas relief in federal court.⁴²⁰ As a result of *Pinholster*, however, such federal review has been severely limited, thus hindering state prisoners' efforts to garner federal habeas relief.⁴²¹ As Professor Samuel Wiseman has shown, *Pinholster* substantially changes the foundation in which federal courts can review state records in habeas cases, thereby magnifying the need for prisoners to adequately develop their records and claims in state court.⁴²²

Petitioners have begun to create strategies to circumvent *Pinholster*; yet it remains unclear how effective these strategies will be.⁴²³ To provide context for such modifications, the next part of this Section examines the procedural history and evidence that frames *Pinholster*. The discussion then considers how *Pinholster* may affect currently pending and future behavioral genetics evidence cases.

1. History and Evidence

In 1984, Scott Lynn Pinholster was convicted in state court of murder.⁴²⁴ After accepting and rejecting several attorneys and even representing himself at one point, Pinholster later reconsidered and accepted the two

416. See *infra* Subsection III.D.2.

417. See *supra* note 415 & *infra* Subsection III.D.1.

418. See *infra* Subsection III.D.2.

419. Pub. L. No. 104-132, 110 Stat 1214 (1996) (codified as amended in scattered sections of the U.S. Code). For an overview of practices before *Pinholster*, see Wiseman, *supra* note 415, at 6-11.

420. See Wiseman, *supra* note 415, at 2-3, 6-11.

421. *Id.* at 11-25.

422. *Id.* at 11-53.

423. *Id.* at 25-53.

424. Cullen v. Pinholster, 131 S. Ct. 1288, 1395-96 (2011).

attorneys the court appointed.⁴²⁵ In a hasty effort to prepare Pinholster's mitigation case,⁴²⁶ Pinholster's counsel consulted with an expert whose conclusions were not in Pinholster's favor. According to the expert, Pinholster "did not manifest any significant signs or symptoms of mental disorder or defect other than his antisocial personality disorder by history."⁴²⁷ In addition, the expert considered Pinholster "cognitively functional, without brain damage."⁴²⁸ Pinholster's counsel did not contact the expert again, nor any other expert.⁴²⁹ Indeed, Pinholster's attorneys billed a total of 6.5 hours in preparation for the penalty phase;⁴³⁰ Pinholster's mother was the only defense witness at the proceeding.⁴³¹

After the jury sentenced Pinholster to death,⁴³² Pinholster twice sought habeas relief in the California Supreme Court.⁴³³ He alleged that his trial counsel had failed to adequately investigate and present mitigating evidence during the penalty phase.⁴³⁴ In an effort to bolster his claim, Pinholster introduced additional evidence: school, medical, and legal records; as well as declarations from family members, one of his trial attorneys, and a psychiatrist.⁴³⁵ While arguing to the state court that his counsel performed deficiently, Pinholster also contended that his attorneys should have pursued and presented information about the following three matters: Pinholster's family members and their criminal, mental, and substance abuse problems; Pinholster's schooling; and Pinholster's medical and mental health history, including his epileptic disorder.⁴³⁶ The California Supreme Court summarily denied relief.⁴³⁷ Pinholster subsequently filed a habeas petition claiming that his counsel should have provided one of his key experts, Dr. John M. Stalberg, with his family history, particularly as related to mental disorders; as a result, Dr. Stalberg "would have made further inquiry 'before concluding that [Pinholster] had merely a personality disorder.'"⁴³⁸ The district court held Pinholster's petition in abeyance, and the California Supreme Court ultimately denied his second habeas petition because it lacked merit.⁴³⁹

425. Pinholster v. Ayers, 590 F.3d 651, 657 (9th Cir. 2009) (*rev'd subnom.* Cullen v. Pinholster, 131 S. Ct. 1388 (2011)).

426. *Id.*

427. *Id.*

428. *Id.*

429. *Id.* at 658.

430. *Id.*

431. *Id.*

432. *Id.* at 659.

433. *Id.*

434. *Id.*

435. *Id.*

436. *Id.* at 659-60.

437. *Id.* at 663.

438. *Id.* at 659-60 (quoting John M. Stalberg, M.D., expert testifying physician).

439. *Id.* at 660.

After the case was sent back to federal court, Pinholster next requested an evidentiary hearing, which, while denied for the guilt phase, was granted for the penalty phase.⁴⁴⁰ This time, Pinholster had two experts present new mitigation evidence, including testimony that his childhood was much worse than his mother had described.⁴⁴¹ The revelations about Pinholster's family were striking: his biological father was a drunk, "had mood swings and fits of anger, and was eventually diagnosed as paranoid with narcissistic personality disorder."⁴⁴² Pinholster's older brother Alvin, while charged with the rape and sodomy of a young teen, was found incompetent to stand trial and diagnosed with schizophrenia.⁴⁴³ Alvin later committed suicide.⁴⁴⁴ Pinholster's other siblings were similarly troubled. His younger brother Terry evidenced mild depression and heavily used drugs.⁴⁴⁵ His half-sister Tammy, by age eleven, began abusing alcohol⁴⁴⁶ and, by age seventeen, was arrested with her boyfriend for the sexual assault of a young teenage girl.⁴⁴⁷ Pinholster's half-brother Guy evidenced manic depression, and another half-brother Gary was characterized as "an alcoholic with severe mood swings."⁴⁴⁸

Pinholster's own disorders fit the family pattern but also indicated that accidents and injuries appeared to be part of the source. According to Pinholster's experts, for example, Pinholster "had suffered brain damage that explained his aggressive, impulsive, and antisocial behavior."⁴⁴⁹ One of the experts, a pediatric neurologist, also testified that Pinholster "sustained frontal-lobe injuries" as a result of two car accidents, occurring during childhood. This expert derived this conclusion from two findings: Pinholster's diagnosis of epilepsy and documentation that, at age nine, he had an abnormal electroencephalogram (EEG).⁴⁵⁰

According to the Ninth Circuit, all of this evidence demonstrated that Pinholster's trial counsel were ineffective in complying with *Strickland v. Washington*.⁴⁵¹ Indeed, the court stressed the paucity of counsel's billing records, which "confirm counsel's own admissions that they spent almost no time preparing for the penalty phase hearing that would determine

440. *Id.*

441. *Id.*

442. *Id.*

443. *Id.* at 661.

444. *Id.*

445. *Id.*

446. *Id.*

447. *Id.*

448. *Id.*

449. *Id.*

450. *Id.*

451. *Id.* at 671 (citing *Strickland v. Washington*, 466 U.S. 668 (1984)).

whether Pinholster would live or die.⁴⁵² Thus, the court set forth two conclusions in accordance with *Strickland*. First, Pinholster's counsel were "deficient" for neglecting to research Pinholster's history so that they could provide mitigating evidence during the penalty phase.⁴⁵³ Second, such deficiency "prejudiced the defense," thereby rendering the California Supreme Court's denial of relief on ineffective assistance as a contravention of *Strickland*.⁴⁵⁴

The Supreme Court's grant of certiorari⁴⁵⁵ was followed by an opinion⁴⁵⁶ which, while not directed at Pinholster's behavioral genetics evidence, surely would have some bearing on how such evidence could be considered for future inmates. Writing for the Court, Justice Clarence Thomas took a different stance, for example, on how to interpret trial counsel's billing records, stressing that the records showed that Pinholster's counsel had indeed investigated mitigating evidence.⁴⁵⁷ In reversing the Ninth Circuit, Justice Thomas explained that "[t]here [was] no reasonable probability that the additional evidence presented at Pinholster's state proceedings would have changed the verdict."⁴⁵⁸ Not only would the supplementary information have "largely duplicated the mitigation evidence of [Pinholster's] mother and brother at trial," but any new documentation that may have been offered "is of questionable mitigating value."⁴⁵⁹ Although Justice Thomas did not address Pinholster's genetic evidence specifically, the prior opinion, *Pinholster v. Ayers*,⁴⁶⁰ did discuss the records Pinholster sought to introduce.⁴⁶¹

Yet, despite the fact that behavioral genetics information was presented as part of the mitigating evidence at issue in the *Pinholster* Court's review, the Court's holding is not based on the genetic nature of the evidence. At the same time, *Pinholster* has already had an impact on behavioral genetics evidence cases, and it can be expected to have further influence.

452. *Id.*

453. *Id.* at 664, 671.

454. *Id.* at 664, 674, 684.

455. *Cullen v. Pinholster*, 130 S. Ct. 3410 (2010).

456. *Cullen v. Pinholster*, 131 S. Ct. 1388 (2011). For an overview of the splintered dimensions of the case and how the Justices voted see *supra* note 415.

457. *Pinholster*, 131 S. Ct. at 1404-05.

458. *Id.* at 1393.

459. *Id.*

460. 590 F.3d 651, 657 (9th Cir. 2009) (*rev'd subnom.* *Cullen v. Pinholster*, 131 S. Ct. 1388 (2011)).

461. *Id.* at 657-61.

2. Behavioral Genetics Cases

Behavioral genetics evidence is often not introduced until post-conviction proceedings, and the cases using it frequently involve ineffective assistance of counsel claims.⁴⁶² Therefore, *Pinholster* could have a considerable impact on currently-pending behavioral genetics cases.

Two petitioners in this Article's survey have already had their cases remanded in light of *Pinholster*.⁴⁶³ In each of the cases, the failure to adequately investigate or present behavioral genetics evidence (along with other factors) was grounds for vacating a death sentence and remanding for imposition of a sentence of life in prison.⁴⁶⁴ At the present time, it is unclear whether these petitioners' death sentences will remain vacated. Since *Pinholster* was decided, lower courts have been more reluctant to grant evidentiary hearings;⁴⁶⁵ the decision places a greater burden on a petitioner to adequately develop the factual record in state court, making it uncertain whether federal courts will be permitted to fill the gap in situations where a petitioner is unable to do so.⁴⁶⁶ As Professor Wiseman explains, "Without the safeguard of federal fact development under [AEDPA], cases of egregious unfairness in state post-conviction procedures will demand new solutions."⁴⁶⁷

The cases following *Pinholster* suggest that petitioners seeking habeas relief in the federal courts, particularly those who have claims of ineffective assistance of counsel, will face higher hurdles. *Pinholster* makes clear that federal courts should be basing their determination on whether to grant habeas relief solely on evidence found within the state record.⁴⁶⁸ This situation poses a considerable barrier for petitioners whose grounds for relief are rooted in the inadequacy or absence of certain evidence in state proceedings. In seven of the cases in this Article's Study in which the petitioner's death sentence was vacated or an evidentiary hearing was upheld, the decision was based precisely on the failure to adequately investigate or present behavioral genetics evidence in state court.⁴⁶⁹ It is unclear whether the same results would follow had these cases been decided after *Pinholster*.⁴⁷⁰

462. See *supra* Subsection II.A.

463. See *Ryan v. Detrich*, 131 S. Ct. 2449 (2011); *Ryan v. Jones*, 131 S. Ct. 2091 (2011).

464. *Detrich v. Ryan*, 619 F.3d 1038 (9th Cir. 2010), *vacated*, 131 S. Ct. 2449 (2011); *Jones v. Ryan*, 583 F.3d 626 (9th Cir. 2009), *vacated*, 131 S. Ct. 2091 (2011).

465. See Wiseman, *supra* note 415, at 16-20.

466. See *id.* at 54-55.

467. *Id.* at 54.

468. See *id.* at 1-6.

469. See *Detrich v. Ryan*, 619 F.3d 1038, 1065, 1068-69 (9th Cir. 2010), *vacated*, 131 S. Ct. 2449 (2011); *Hamilton v. Ayers*, 583 F.3d 1100, 1135-36 (9th Cir. 2009); *Jones v. Ryan*, 583 F.3d 626, 643, 647 (9th Cir. 2009), *vacated*, 131 S. Ct. 2091 (2011); *Morales v.*

Pinholster, of course, did not mandate that courts take a less favorable approach to behavioral genetics evidence specifically. At the same time, reaction to the Court's holding indicates that cases seeking appellate relief on the grounds of ineffective assistance of counsel, a category into which behavioral genetics cases have typically fallen, may receive cooler reception in the federal courts. This potential outcome may have implications for the likelihood of success of behavioral genetics cases in general irrespective of any actual change in courts' views of genetics evidence. Indeed, a change in standards to one of greater deference to state and attorney determinations might pose additional problems for petitioners seeking to introduce new facts to the record.

One way for a petitioner to avoid the hurdles created by *Pinholster* would be to convince the court that the petitioner's claims were not "adjudicated on the merits" in state proceedings. The future success rate of these claims may be an indicator of whether new evidence remains a key component in obtaining federal habeas relief on two levels—in the context of behavioral genetics evidence and also in the broader sense of ineffective assistance of counsel claims in habeas proceedings.

CONCLUSION

For decades, the link between behavioral genetics and criminality has been haunted with controversy, raising questions about how such evidence is, or should be, applied. This Article tackles those questions by analyzing a unique study of all criminal cases (totaling thirty-three) that addressed behavioral genetics evidence from June 1, 2007, to July 1, 2011. The Study builds upon this Author's prior research on all criminal cases (totaling forty-eight) that used such evidence during the preceding thirteen years (1994-2007). This combined collection of eighty-one criminal cases employing behavioral genetics evidence offers a rich context for determining how the criminal justice system has been handling genetics factors for nearly two decades, but also why the last four years reveal particularly important discoveries. Results suggest that not only is much of the controversy surrounding behavioral genetics and crime unwarranted, the use of such evidence has been misunderstood.

Mitchell, 507 F.3d 916, 942 (6th Cir. 2007); Allison v. Cullen, 725 F. Supp. 2d 924, 925 (C.D. Cal. 2010); Hall v. McPherson, 663 S.E.2d 659, 664 (Ga. 2008); Commonwealth v. Williams, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193, at *15 (Pa. D. & C. May 13, 2010); see also *supra* note 185 and accompanying text (describing the circumstances of these seven cases).

470. In an effort to address the uncertainty, Professor Wiseman suggests that defendants will search for ways to get around *Pinholster*. See Wiseman, *supra* note 415, at 25-53. For this Article's purposes, however, examining such alternatives waits for another day.

Within the last four years, for example, behavioral genetics evidence has appeared to have been applied almost exclusively as mitigating evidence in death penalty cases and primarily in two ways—to support claims of ineffective assistance of counsel for neglecting such evidence or to provide proof and diagnosis of a defendant’s mitigating condition. Strikingly, this Study found no case during 2007-2011 in which behavioral genetics factors were introduced by the State, much less used as aggravating evidence or as indications that a defendant would be a future danger to others. These findings debunk arguments that such evidence will be legally detrimental to a defendant. Indeed, in most cases, the evidence is so tightly intertwined with other factors in a defendant’s life that the particular impact of behavioral genetics can be difficult to isolate. This Study’s results suggest that, at the very least, behavioral genetics evidence has no decipherable impact on a defendant’s case or, at most, it becomes an effective tool along with a range of other kinds of variables in rendering a defendant ineligible for the death penalty. Courts appear willing to accept behavioral genetics evidence as part of a defendant’s mitigation story, even if genetics renders that story a more troubling one in terms of the defendant’s purported propensities. The last four years also showed a number of break-a-way trends from earlier years. For example, there were substantially more cases that incorporated behavioral genetics evidence of any kind. In addition, there was a clear increase in the number of cases in which defendants submitted proof of a genetic propensity for alcoholism and/or substance abuse.

Overall, this Article’s research shows that courts accept behavioral genetics evidence in the majority of cases in which defense attorneys attempt to offer it. In contrast to past years when courts at times questioned the applicability or relevance of such information, recent findings indicate that their focus has turned elsewhere. In particular, courts emphasize the importance of determining whether the evidence, when used with other factors in mitigation, can outweigh the aggravating factors that support a death sentence. The coming years will reveal whether such trends will be affected by *Cullen v. Pinholster*,⁴⁷¹ the Supreme Court’s recent decision restricting prisoners’ efforts to seek federal habeas relief under AEDPA.⁴⁷² Regardless, behavioral genetics evidence seems, on the surface, to have reached a status commensurate with other kinds of evidence without the baggage of abuse with which it has typically been associated.

471. 131 S.Ct. 1388 (2011).

472. Pub. L. No. 104-132, 110 Stat 1214 (1996) (codified as amended in scattered sections of the U.S. Code).

Chart 1
Severity of Sentencing by Number of Cases
33 Total Cases

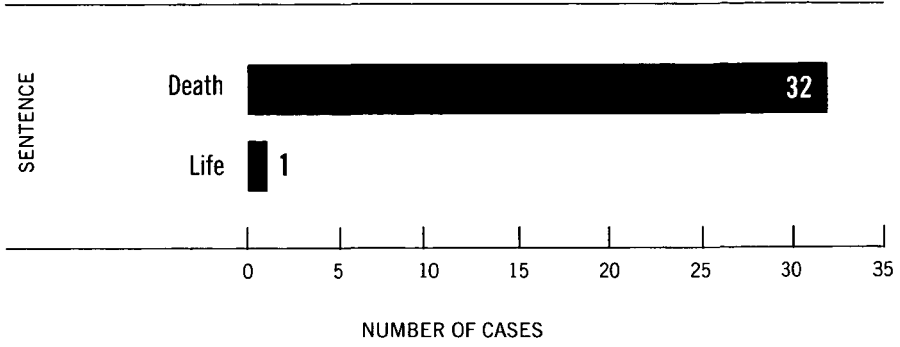


Chart 2
**Tactical Strategies for Using Genetics Evidence
by Number of Cases***
33 Total Cases

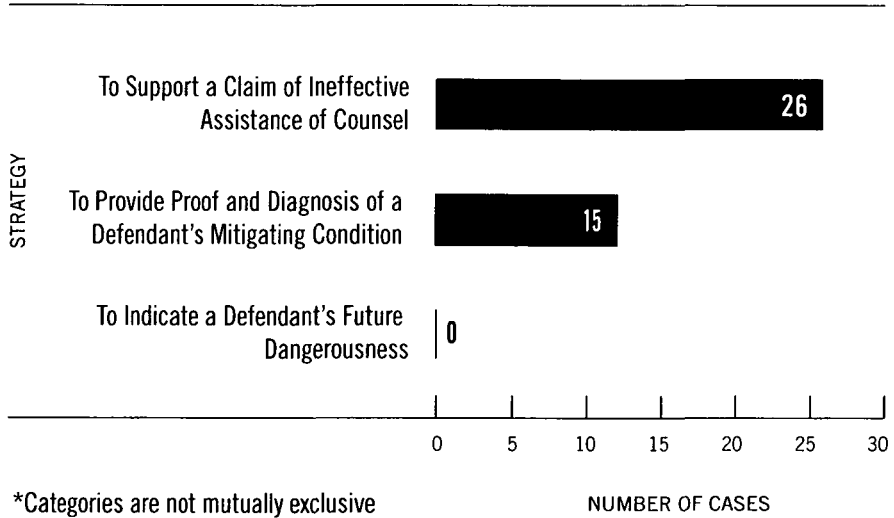


Chart 3
Purpose of Presenting Genetics Evidence by Number of Cases
33 Total Cases

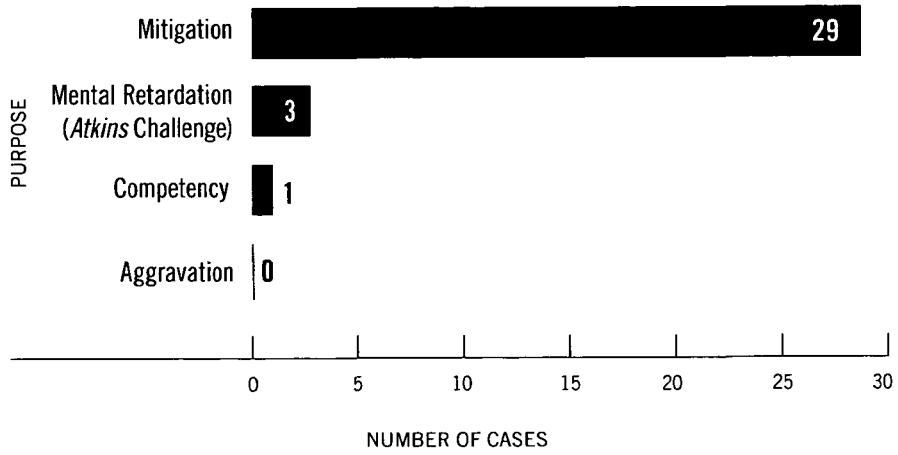
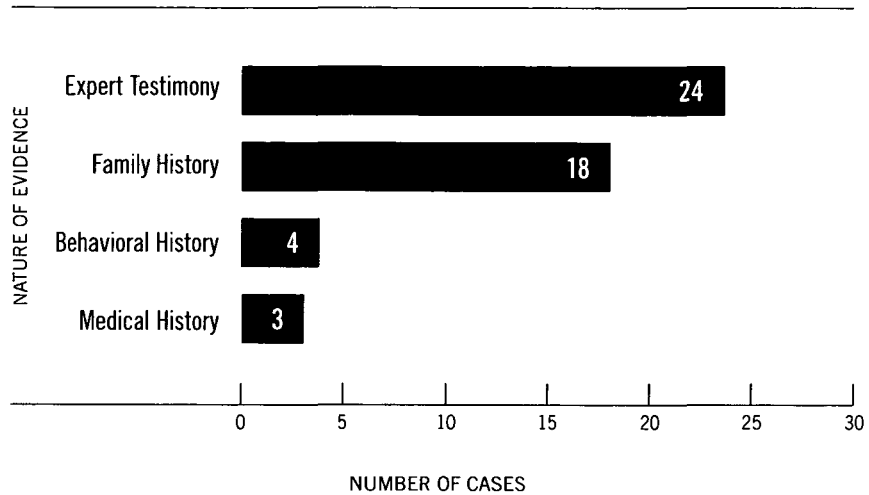
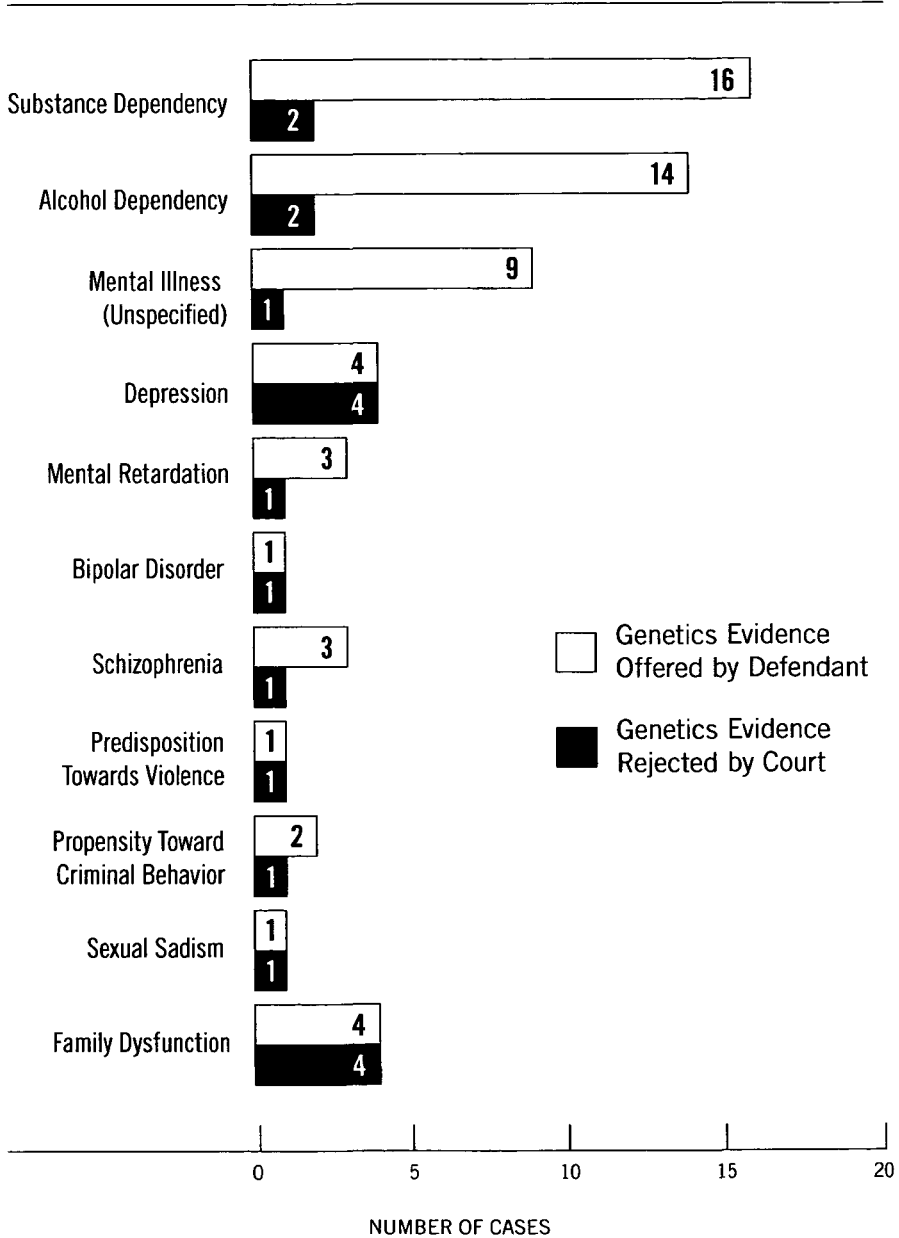


Chart 4
**Nature of Genetics Evidence Sought to be Admitted
by Number of Cases***
33 Total Cases



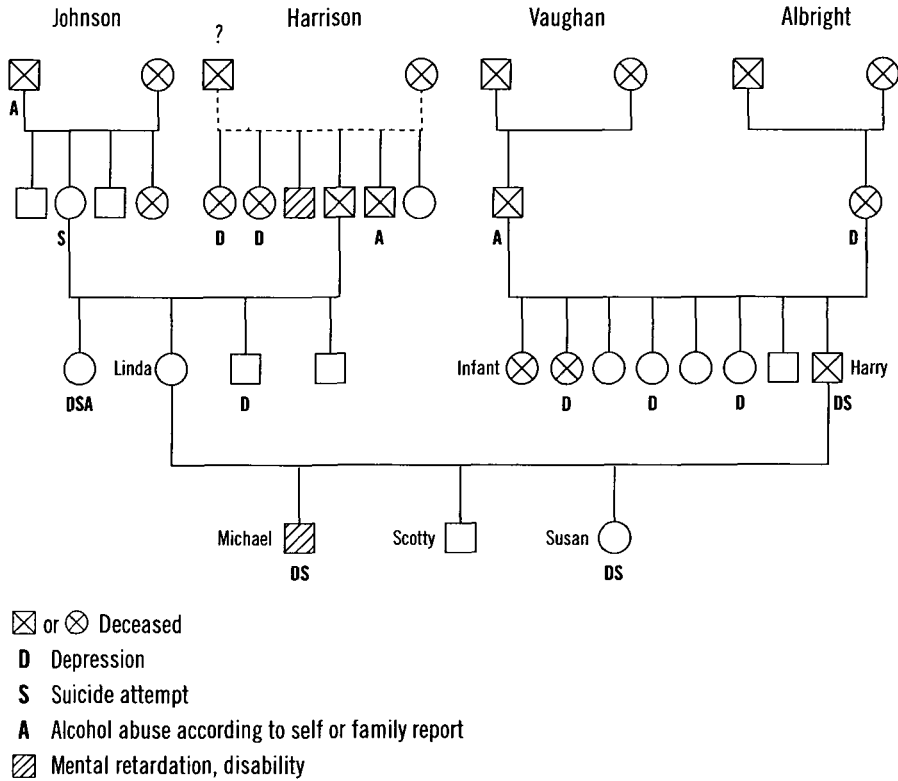
*Categories are not mutually exclusive

Chart 5
Reasons for Introducing Genetics Evidence by Number of Cases*
33 Total Cases



*Categories are not mutually exclusive

Figure 1
Genogram Presented in the Susan Smith Case*



* Modified for presentation purposes

APPENDIX

CRIMINAL CASES REFERENCING BEHAVIORAL
GENETICS EVIDENCE:

JUNE 1, 2007 - JULY 1, 2011*

Year	Cases
2006	<p data-bbox="364 600 1088 1213">Loving v. United States, 64 M.J. 132 (C.A.A.F. 2006), 68 M.J. 1 (C.A.A.F. 2009), <i>cert. denied</i>, 131 S. Ct. 67 (2010). Defendant was convicted of premeditated murder and sentenced to death. He raised claims of ineffective assistance of counsel for counsel's failure to investigate and present mitigating evidence of defendant's family history of alcohol and substance abuse addiction, which could point to a genetic predisposition. Remanding for an evidentiary hearing to determine whether counsel closed the investigation prematurely, the court cited that defendant's traumatic family background and upbringing demonstrated sufficient cause to establish a basis for review. At the evidentiary hearing, testimony was presented regarding defendant's family history of drug use, as well as biopsychosocial assessment. Upon conclusion of the evidentiary hearing, the United States Court of Appeals for the Armed Forces found that the new evidence was largely cumulative and that its exclusion was not prejudicial to defendant. The habeas relief petition was denied.</p> <p data-bbox="364 1251 1088 1584">Hamilton v. Ayers, 458 F. Supp. 2d 1075 (E.D. Cal. 2006), <i>aff'd in part, rev'd in part</i>, 583 F.3d 1100 (9th Cir. 2009). Defendant, facing a murder conviction and death sentence, petitioned for a writ of habeas corpus. Defendant claimed he was incompetent to stand trial and that his counsel failed to investigate his mental state. Defendant's expert witnesses testified that defendant had a family history of genetic disorders and a traumatic upbringing. The district court rejected the petition, noting the absence of medical records documenting defendant's mental state, or any indication that defendant</p>

* The three 2006 cases are included in this Article's study because, in addition to their 2006 decisions, their subsequent case histories also made reference to behavioral genetics evidence.

	<p>behaved irrationally during the trial or failed to understand the proceedings. The court held that defendant was competent to stand trial. On appeal in the Ninth Circuit, the court held that counsel was in fact deficient for failing to investigate and present mitigating evidence, such as evidence of defendant's mental health history and extremely abusive childhood. The court remanded the case to the superior court with instructions to reduce the punishment to a life sentence without possibility of parole.</p> <p>Mickey v. Ayers, No. C-93-0243 RMW, 2006 WL 3358410 (N.D. Cal. Nov. 17, 2006), <i>aff'd in part, rev'd in part</i>, 606 F.3d 1223 (9th Cir. 2010), <i>cert. denied</i>, 132 S. Ct. 419 (2011). Defendant, facing a murder conviction and death sentence, claimed ineffective assistance of counsel at the penalty phase of the trial, arguing that his counsel had failed to utilize effectively the skill and knowledge of mental health experts in presenting defendant's mitigation evidence. According to defendant, counsel could have made a successful mitigation case that defendant's genetic propensities, when combined with his family upbringing and mental illness, caused him to be predisposed to alcohol and drug dependency. The district court agreed. On appeal, however, the Ninth Circuit found that the additional mitigation evidence was unreliable and that counsel had effectively utilized the input of mental health experts at trial. The court further held that counsel's failure to present this evidence was not prejudicial because the prosecution would have rebutted with evidence of defendant's sexually deviant behavior. With regard to genetic evidence, the court found that the second penalty phase expert's research into genetic links of certain diseases was in a nascent stage at the time of trial. As a result, counsel was not deficient in failing to provide the expert with defendant's family history of substance abuse.</p>
2007	<p>Morales v. Mitchell, 507 F.3d 916 (6th Cir. 2007), <i>reh'g en banc denied</i>, Nos. 00-3694/3787, 2008 U.S. App. LEXIS 5909 (6th Cir. Mar. 10, 2008). Defendant faced the death sentence for murder. Expert testimony was presented during the trial phase that Native Americans have a genetic predisposition for alcoholism, and defendant, a Native American, was therefore predisposed to become alcoholic and intoxicated. On appeal, defendant claimed ineffective assistance of counsel for counsel's failure to adequately investigate a va-</p>

riety of sources related to defendant's condition: his extensive family history of alcoholism, his cultural background and its effect on him, and a potential neurological cause of his mental and emotional deficiencies due to lifelong alcohol consumption. Counsel also neglected to hire a mitigation expert. The court held that defendant's counsel was ineffective because counsel failed to conduct an investigation for mitigating evidence. Such evidence included the following: indications of alcoholism in defendant's family, defendant's own alcoholism and its effects on him (he was prone to blackouts), and defendant's upbringing (alcoholic, absent parents and a mentally retarded, abusive brother).

Malone v. State, 168 P.3d 185 (Okla. Crim. App. 2007). Defendant was convicted of first-degree murder and sentenced to death. At trial, a physician and addiction medicine specialist testified about genetic predisposition to addiction and depression, as well as the effects of methamphetamine on the brain. The specialist also testified about the substantial history of addiction and depression in defendant's family. Defendant appealed his conviction on several issues, including ineffective assistance of counsel. His case was remanded for resentencing on a different issue.

Schurz v. Schriro, No. CV-97-580-PHX-EHC, 2007 WL 2808220 (D. Ariz. Sept. 25, 2007). Defendant was found guilty of first-degree murder and attempted aggravated robbery. Defendant initiated habeas proceedings after his petitions for post-conviction relief were denied. Among defendant's claims was ineffective assistance of counsel for counsel's failure to adequately investigate and present available mitigation evidence. Defendant argued that evidence of fetal alcohol syndrome, genetic predisposition to addiction and mental illness, and extreme physical and verbal abuse in the home should have been presented. The court found that this evidence was not significantly different from the mitigating evidence presented at trial. In addition, defendant had not demonstrated how his dysfunctional background had any effect on his ability to control, comprehend, or perceive his actions at the time of the murder. Habeas relief was denied.

Wood v. Schriro, No. CV-98-053-TUC-JMR, 2007 WL 3124451 (D. Ariz. Oct. 24, 2007). Defendant was convicted of first-degree murder and aggravated assault and sentenced

	<p>to death. On appeal, defendant claimed that trial counsel had rendered ineffective assistance for two reasons. First, counsel had failed to sufficiently prepare a defense expert witness, a neuropsychologist. Second, counsel neglected to investigate and present mitigating evidence related to defendant's social and medical background, including evidence of head injuries and a family history of alcoholism. The court affirmed denial of habeas relief, finding that counsel had actually developed and presented such evidence in detail (counsel had even sought appointment of a neurometric brain-mapping technician).</p> <p>Berryman v. Ayers, No. 1:95-CV-05309-AWI, 2007 WL 1991049 (E.D. Cal. July 10, 2007). Defendant was convicted of rape and murder and sentenced to death. After numerous appeals and petitions, defendant filed a request for an evidentiary hearing on a number of claims, including ineffective assistance of counsel. At trial, it was mentioned that defendant suffered from some organic brain damage, had a family history of alcoholism and substance abuse, and was genetically predisposed to alcoholism and depression. A PET scan of defendant's brain was introduced, suggesting evidence of abnormal activity. Defendant's ineffective assistance of counsel claim, and subsequently, his habeas corpus petition, were denied. Since the time <i>Berryman v. Ayers</i> was decided, defendant was granted a certificate of appealability on the issue of ineffective assistance of counsel for counsel's failure to uncover evidence of defendant's dysfunctional family history. See <i>Berryman v. Wong</i>, No. 1:95-CV-05309-AWI, 2010 WL 289181, at *1 (E.D. Cal. Jan. 15, 2010).</p>
2008	<p>Hodges v. Bell, 548 F. Supp. 2d 485 (M.D. Tenn. 2008). Defendant was convicted of murder and sentenced to death. One of defendant's claims on appeal was that the trial court had denied him funding for an expert in the field of genetic transmission of drug and alcohol dependency, in violation of defendant's Eighth and Fourteenth Amendment rights. The court upheld the trial court's denial of the expert services, stating that counsel was capable of presenting to the court information about the substance addictions, and the court was able to process that information without the need for an expert. The court denied petitioner's habeas petition and dismissed his action with prejudice.</p>

	<p>Hall v. McPherson, 663 S.E.2d 659 (Ga. 2008). Defendant was convicted of murder and theft and sentenced to death on the murder charge. Defendant applied for a writ of habeas corpus, alleging ineffective assistance of counsel for counsel's failure to present and investigate mitigating evidence. This evidence, presented at the habeas hearing, included testimony from a psychiatrist regarding defendant's family tree, which indicated defendant's genetic predisposition to substance dependence disorder. The habeas court vacated defendant's death sentence, and the warden appealed. On appeal, the court upheld the habeas court's vacation.</p> <p>Williams v. Norris, No. 5:07cv00234 SWW, 2008 WL 4820559 (E.D. Ark. Nov. 4, 2008), <i>aff'd</i>, 612 F.3d 941 (8th Cir. 2010), <i>cert. denied</i>, 131 S. Ct. 1677 (2011). Defendant was serving a life sentence for murder, kidnapping, robbery, theft, and arson when he escaped from prison and robbed and killed another victim. Defendant was subsequently convicted of capital felony murder and theft of a vehicle and sentenced to death on the murder conviction. After his appeals and petitions for post-conviction relief were denied, defendant filed for habeas relief in federal court. There he asserted that counsel was ineffective for failing to introduce supporting documentation of mitigating evidence, including evidence of generational family dysfunction. The court denied habeas relief, finding that counsel presented a thorough and lengthy investigation of defendant's social, physical, educational, and family history.</p>
2009	<p>Brant v. State, 21 So. 3d 1276 (Fla. 2009). Defendant was convicted of murder, sexual battery, burglary, kidnapping, and grand theft of a motor vehicle. He was sentenced to death on the murder charge. On appeal, defendant argued that his death sentence was disproportionate. At defendant's trial, a forensic psychiatrist testified that defendant suffered from sexual sadism, a condition that normally arises from a combination of a genetic predisposition to sexual sadism and an unhealthy childhood environment. Defendant's mother also testified to a family history of depression. A PET scan of defendant's brain was produced at trial, indicating low activity in the areas governing impulse control and good judgment. Defendant's death sentence was affirmed by the court, which found that the mitigating evidence did not outweigh the aggravating evidence.</p>

Simpson v. State, 3 So. 3d 1135 (Fla. 2009). Defendant was convicted on two counts of murder and sentenced to death. Although not an issue on appeal, during the trial, defendant presented evidence from a psychiatrist who testified that defendant had a genetic predisposition to alcohol and substance abuse. The inheritance pattern and observation of violence during defendant's youth made it twenty percent more likely that defendant would have a behavioral problem or become a criminal. The court reaffirmed defendant's death sentence.

Henry v. Ryan, No. CV 02-656-PHX-SRB, 2009 WL 692356 (D. Ariz. Mar. 17, 2009). Defendant was convicted of first-degree murder, robbery, kidnapping, and theft, and was sentenced to death. In his third petition for post-conviction relief, defendant argued that his resentencing counsel had performed ineffectively by failing to obtain a complete life history and present mitigating evidence regarding defendant's mental health. A presentence investigation report noted defendant's family history of schizophrenia and defendant's own schizophrenic symptoms. Since the information had been available at presentencing, the court denied relief.

Jones v. Ryan, 583 F.3d 626 (9th Cir. 2009), *vacated*, 131 S. Ct. 2091 (2011). Defendant was convicted on two counts of murder and one count of attempted murder and sentenced to death. Defendant filed a petition for post-conviction relief, claiming ineffective assistance of counsel because of counsel's failure to do the following: hire a mental health expert, move for neurological and neuropsychological testing, and present additional mitigating witnesses and evidence. The petition was denied, and defendant appealed. On appeal, one of the mitigating factors considered by the court was defendant's longstanding substance abuse problem that may have been caused by genetic influences and further aggravated by head trauma. The court agreed that defendant's counsel was ineffective, reversed the district court's decision, and remanded with instructions to issue a writ of habeas corpus. The U.S. Supreme Court later reversed and remanded the case in *Ryan v. Jones*, 131 S. Ct. 2091 (2011), in light of *Cullen v. Pinholster*, 131 S. Ct. 1388 (2011).

Rienhardt v. Ryan, 669 F. Supp. 2d 1038 (D. Ariz. 2009). Defendant was convicted of kidnapping, attempted transfer of a dangerous drug, attempted arson, and first-degree murder.

He was sentenced to death on the murder charge. On appeal, defendant argued that his counsel performed ineffectively at sentencing in violation of his rights under the Sixth, Eighth, and Fourteenth Amendments. In particular, counsel had failed to conduct a mitigation investigation to advise defendant on whether to present any mitigation evidence. The documents contained in defendant's presentence report included such information as defendant's social history, childhood details, education, family background, employment history, and alcohol and drug abuse. The court found that defendant failed to demonstrate prejudice.

Woodall v. Simpson, No. 5:06-CV-P216-R, 2009 WL 464939 (W.D. Ky. Feb. 24, 2009). Defendant was convicted of kidnapping, rape, and murder, and sentenced to death. Defendant then filed a writ of habeas corpus to the district court, citing thirty errors, multiple of which were based on an ineffective assistance of counsel claim. Part of this claim alleged that counsel was ineffective for failing to present a genetic defect defense, and neglecting to link defendant's mental state to his genetic history. The court held on this claim that the jury could have inferred that defendant's family had a genetic history of mental problems. However, the court found that two other claims made by defendant warranted relief, and granted habeas on these claims. Defendant's sentence was vacated and remanded to state trial court.

Hall v. Quarterman, No. 4:06-CV-436-A, 2009 WL 612559 (N.D. Tex. Mar. 9, 2009). Defendant was convicted of capital murder and sentenced to death. Following a series of appeals, the U.S. Supreme Court vacated the Texas Court of Criminal Appeals' decision and remanded the case for reconsideration in light of *Atkins v. Virginia*, 536 U.S. 304 (2002). In defendant's habeas action, the trial court ordered a hearing by way of affidavits on the issue of defendant's mental retardation. On the basis of this hearing, the court concluded that defendant was not mentally retarded. One of the affidavits contained the contested assertion that defendant demonstrated characteristics consistent with a genetic disorder. After subsequent appeals, the Fifth Circuit vacated the district court's judgment denying habeas relief and remanded for further proceedings, including an evidentiary hearing. After a review of the record and an evidentiary hearing, the district court denied habeas relief.

2010	<p>Hawkins v. Wong, No. CIV S-96-1155 MCE EFB DP, 2010 WL 3516399 (E.D. Cal. Sept. 2, 2010). Defendant was convicted of felony murder, attempted murder, and robbery, and then sentenced to death. Defendant claimed counsel provided ineffective assistance for failing to investigate and present mitigating evidence during the penalty phase of defendant's trial. Defendant asserted such evidence would have shown that he was genetically predisposed to alcoholism and mental illness, and that his immediate family and generations before them demonstrated extraordinary pathology and dysfunction. A social historian could have testified about defendant's family tree, which included many alcoholics, thereby indicating a genetic predisposition to alcoholism. The court allowed an evidentiary hearing on defendant's ineffective assistance of counsel claim.</p> <p>Morris v. Malfi, No. C 06-7409 SI, 2010 WL 2629738 (N.D. Cal. June 29, 2010), <i>aff'd</i>, 449 F. App'x 686 (9th Cir. 2011). Defendant was convicted of carjacking and first-degree murder. In a petition for writ of habeas corpus, defendant claimed his due process rights were violated because he was tried while mentally incompetent. He also claimed for the first time that he suffered from paranoid delusions and schizophrenia. During the penalty phase of his trial, defendant submitted evidence of sustained head injuries in the frontal lobe of his brain, which governs impulse control. Defendant also submitted a 2009 declaration from a psychologist stating that defendant suffered from cognitive deficits and a genetic predisposition to chronic psychopathology. The psychologist had conducted neurological testing on defendant and found a "severe impairment of memory, judgment, insight, and other cognitive functions needed to understand legal proceedings and meaningfully assist counsel." <i>Id.</i> at *15 (quoting declaration). The court denied the writ of habeas corpus on the basis that the new evidence did not raise real questions of defendant's competence at the time of the crime, but issued a certificate of appealability.</p> <p>Creech v. Hardison, No. CV 99-0224-S-BLW, 2010 WL 1338126 (D. Idaho Mar. 31, 2010). Defendant was serving two life sentences for murder when he murdered another prisoner. He was convicted of this murder and sentenced to death. Defendant petitioned for a writ of habeas corpus but, at his resentencing hearing, the court found that the aggravating</p>
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factors outweighed the mitigating factors and reaffirmed defendant's death sentence. Defendant claimed ineffective assistance of counsel at resentencing for counsel's failure to conduct a reasonable mitigation investigation. At the resentencing hearing, a psychologist testified that defendant might have a biological or genetic predisposition for violence. On appeal from the resentencing court's judgment, defendant introduced new evidence showing he had "bilateral brain damage that affected [his] insight, judgment and capacity to exercise social inhibitions." *Id.* at *14 (alteration in original) (quoting docket). The district court dismissed defendant's claims and denied reconsideration, but issued a certificate of appealability.

Allison v. Cullen, No. CV 92-06404 CAS, 2010 U.S. Dist. LEXIS 82957 (C.D. Cal. July 22, 2010); *see also* Allison v. Cullen, 725 F. Supp. 2d 924 (C.D. Cal. 2010) (publishing only the judgment portion of the decision). Defendant and his co-conspirator were tried separately in the home invasion and murder of the victim. Defendant was convicted and sentenced to death. Defendant applied for a writ of habeas corpus alleging ineffective assistance of counsel for counsel's failure to investigate and present mitigating evidence during his trial. While most of this evidence focused on defendant's traumatic childhood, one expert witness stated that defendant might have a genetic predisposition to alcoholism, substance abuse, and mental illness. There was widespread alcoholism on defendant's mother's side of the family, as well as depression and alcoholism on his father's side of the family. The court vacated the death sentence and granted relief for defendant's ineffective assistance of counsel claim.

Detrich v. Ryan, 619 F.3d 1038 (9th Cir. 2010), *vacated*, 131 S. Ct. 2449 (2011). Defendant, who faced the death sentence for murder, kidnapping, and sexual abuse, claimed that counsel provided ineffective assistance for failing to present mitigating evidence. Defendant presented evidence of head injuries and expert witnesses who testified that defendant had neuropsychological deficits (some of which may have been inherited) that prevented him from controlling his impulses. The Court of Appeals found that counsel's failure to include evidence of defendant's neuropsychological damage, along with defendant's history of an abusive and traumatic childhood, constituted ineffective assistance. Defendant's death

sentence was vacated and his case was remanded to the district court. The U.S. Supreme Court later reversed and remanded the case in *Ryan v. Detrich*, 131 S. Ct. 2449 (2011), in light of *Cullen v. Pinholster*, 131 S. Ct. 1388 (2011).

Ex parte Smith, ___ So.3d ___, No. 1080973, 2010 WL 4148528 (Ala. Oct. 22, 2010). Defendant was convicted of three counts of murder and sentenced to death. The issue on appeal was whether defendant was mentally retarded and therefore ineligible for the death penalty. Defendant claimed he had a genetic predisposition for mental retardation and that five of his family members suffered from the same condition. The trial court had held an *Atkins* hearing (pursuant to *Atkins v. Virginia*, 536 U.S. 304 (2002)), and concluded that defendant was not mentally retarded. The Alabama Supreme Court affirmed the trial court but remanded the case based on another issue.

Keough v. State, No. W2008-01916-CCA-R3-PD, 2010 WL 2612937 (Tenn. Crim. App. June 30, 2010), *vacated*, 356 S.W.3d 366 (Tenn. 2011). Defendant was convicted of first-degree murder of his wife and attempted murder of his neighbor, and sentenced to death. He applied for post-conviction relief on the basis of ineffective assistance of counsel for counsel's failure to investigate further into his mental state. At the post-conviction hearing, a specialist in addiction medicine testified that alcoholism was genetically inherited and that defendant had a family history of alcoholism. When the petition was denied, defendant appealed to the Court of Criminal Appeals of Tennessee. The court affirmed defendant's convictions and death sentence, stating that the additional evidence would not have changed the outcome of the case. The Tennessee Supreme Court then vacated the Court of Criminal Appeals' judgment after finding that a state statute governing cross examination in post-conviction procedures was violated.

Commonwealth v. Williams, Nos. 200001876, 200002869, 2010 Pa. Dist. & Cnty. Dec. LEXIS 193 (Pa. D. & C. May 13, 2010). Defendant, who was sentenced to death after convictions for first degree murder and abuse of a corpse, petitioned to seek a sentence of life instead contending that he was mentally retarded and not death-eligible under *Atkins v. Virginia*, 536 U.S. 304 (2002). At defendant's post-

conviction relief hearing, both the defense and the Commonwealth presented expert witnesses regarding the issue of whether or not defendant had mental retardation. Upon holding that defendant was mentally retarded, the court relied in part on three criteria delineated in *Atkins*: subpar intellectual functioning, impaired adaptive skills, and evidence of mental challenges before age eighteen. Defendant also submitted additional evidence that supported his claim of mental retardation: brain damage, severe childhood abuse, genetic predisposition to mental retardation, lack of maternal prenatal care, and poor nutrition during defendant's developmental years. Citing *Atkins*, the court granted the portion of defendant's petition seeking to vacate the death penalty and impose a sentence of life imprisonment.

Purkey v. United States, No. 06-8001-CV-W-FJG, 2010 WL 4386532 (W.D. Mo. Oct. 28, 2010). Defendant was convicted of kidnapping, rape, and murder, and then sentenced to death. After several appeals, defendant sought a certificate of appealability on four issues, one of which was whether he was denied effective assistance of counsel due to his counsel's failure to adequately investigate and present available mitigating evidence. Mitigating evidence that was introduced included evidence of brain injuries and a genetic predisposition to alcoholism and substance abuse. The court found that it was not reasonably possible that the testimony of additional witnesses would have swayed a change in a juror's vote, and denied the certificate of appealability.

Darling v. Sec'y, No. 6:07-cv-1701-Orl-31GJK, 2010 WL 2471441 (M.D. Fla. June 17, 2010), *cert. denied*, 131 S. Ct. 1492 (2011). Defendant was convicted of murder and sexual battery, and sentenced to death on the murder charge. After numerous appeals and petitions for post-conviction relief, defendant filed a writ of habeas corpus for ineffective assistance of counsel citing counsel's failure to submit mitigating evidence of defendant's abuse and frontal lobe brain damage. Defendant's evidentiary hearing provided expert witness testimony that defendant suffered from neuropsychological cognitive dysfunction, and that defendant's brain damage limited his ability to inhibit his behavior. The court found, however, that counsel's investigation of mitigating evidence was reasonable. Although counsel did not know of the neurological damage, counsel had presented evidence that defendant's

	<p>father was an alcoholic and defendant had an abusive childhood. Furthermore, it was questionable whether defendant had neurological damage. The writ of habeas corpus was denied.</p> <p>Turner v. Epps, No. 4:07CV77-WAP, 2010 WL 653880 (N.D. Miss. Feb. 19, 2010), <i>cert. denied</i>, 132 S. Ct. 998 (2012). Defendant was convicted on two counts of capital murder and sentenced to death. Defendant submitted a writ of habeas corpus after his appeal and petition for post-conviction relief were unsuccessful. One of defendant's claims turned on ineffective assistance of counsel for counsel's failure to present mitigating evidence during the sentencing phase of the trial. According to defendant, counsel did not investigate or present evidence of defendant's depressive disorders, family history of mental illness, or genetic predisposition to mental illness. The court denied defendant's petition for habeas relief.</p>
2011	<p>Worthington v. Roper, 631 F.3d 487 (8th Cir. 2011), <i>cert. denied</i>, 132 S. Ct. 763 (2011). Defendant was convicted of rape, murder, and burglary of his neighbor and sentenced to death on the murder charge. After a number of appeals, defendant applied for a writ of habeas corpus, claiming ineffective assistance of counsel for counsel's failure to investigate and present a more detailed social history. The medical background defendant wished to present included evidence of a genetic predisposition to, and family history of, depression, bipolar disorder, schizophrenia, and brain dysfunction. The court ruled that trial counsel's decision to forgo presentation of this evidence was informed and strategic.</p> <p>Rhoades v. Henry, 638 F.3d 1027 (9th Cir. 2011), <i>cert. denied</i>, 132 S. Ct. 401 (2011). Defendant was convicted of kidnapping, robbery, and murder, and then sentenced to death. On appeal, defendant claimed that trial counsel was ineffective in failing to conduct or complete an investigation that would have uncovered mitigating evidence about defendant's youth in a family context of physical and emotional violence, drugs, alcohol, and sexual abnormality. Defendant submitted a 1,000 page proffer that included assessments from a neuropsychologist and a neurologist. According to both experts, the alcoholism and suicides in defendant's family very likely played a genetic role in the mental and emotional health of</p>

defendant. Defendant was genetically loaded for substance abuse, and he had inherited the diseases of alcoholism and drug abuse. The court expressed skepticism about the genetic evidence and its ability to shed light into defendant's state of mind at the time of the crime. Ultimately, the court determined that the mitigating factors would not have made a difference in the actual outcome of the cases and affirmed defendant's convictions and death sentence.

Cullen v. Pinholster, 131 S. Ct. 1388 (2011). Defendant was convicted of murder and sentenced to death. Defendant was eventually granted habeas relief on his ineffective assistance of counsel claim for counsel's failure to investigate and present mitigating evidence. Evidence that should have been presented included family members' criminal, mental, and substance abuse problems, and defendant's medical and mental health history (such as his epileptic disorder). The prison warden challenged the judgment, and the U.S. Supreme Court reversed the judgment, holding that counsel had investigated the mitigating evidence.

Commonwealth v. Gibson, 19 A.3d 512 (Pa. 2011). Defendant was convicted of murder and sentenced to death in a 1997 trial. Defendant was later granted post-conviction relief on the basis of ineffective assistance of counsel. The Commonwealth appealed. At the 2009 evidentiary hearing, a forensic psychiatrist referenced a multi-generational pattern of alcohol abuse in support of defendant's claim of genetic predisposition to substance abuse. The court concluded that the new evidence would not have affected the outcome. Defendant's post-conviction relief petition was denied.

