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SEX-BASED BRAIN DIFFERENCES AND EMOTIONAL HARM

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ABSTRACT

Technological advances have allowed neuroscientists to identify brain differences between women and men, which may lead to explanations for sex-biased population differences in behavior and brain-based disorders. Although the research is at its early stages, this is an appropriate time to examine some of the potential legal implications of these findings. This Article examines that question in the context of tort law, especially how scientific findings may affect the use of the reasonable person standard in emotional injury claims. Specifically, studies suggest that there may be distinct sex-based mechanisms involved in reactions to extreme stress, raising the question of whether women experience and process stress and trauma differently than men.

This Article argues that these studies may eventually inform the use of the reasonableness standard for freestanding emotional harm claims. As science further develops, courts may either apply a reasonable woman standard in limited contexts or at least allow jurors to consider evidence of sex-based differences in applying a reasonable person standard. Recognizing these differences, courts have already begun to apply the reasonable woman standard to hostile workplace environment claims, and science may support broader use of that standard, especially for negligent and intentional infliction of emotional harm claims.

INTRODUCTION

The last decades of legal development rightfully have broken down artificial sex-based distinctions over a range of fronts—from

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employment to education and inheritance. We have Justice Ruth Bader Ginsburg to thank for so much of these efforts.¹ But in recent years, science has identified sex-based differences in brain structure and function that may force the law to rethink its approach to sex neutrality in some situations. This Article explores that problem in the context of tort law.

Technological advances have allowed us to study the brain in new ways, resulting in findings that indicate some subtle, but real, differences in structure and function between male and female brains. Neuroscientists have begun to examine these sex-based differences and consider how they may aid in our understanding of brain physiology. Naturally, this research has sparked debates in the scientific community over a host of issues.² Some question the validity of the findings entirely, expressing doubt over their central conclusions. Other researchers conclude that the brain is a highly sex-influenced organ.³ Similarly, some research identifies “mosaics” of “female-typical” features and “male-typical” features in individual brains. Others claim that any documented differences are a result of—or significantly influenced by—confounding factors like one’s developmental environment. In short, no consensus exists.⁴ Still, the hope in pursuing this research is that it will lead to new avenues of diagnosis and treatment for brain disorders, especially those disorders that exhibit sex-biased differences in the incidence or nature of disease, like migraines, depression, post-traumatic stress disorder (“PTSD”),

1. See Robin West, *Women in the Legal Academy: A Brief History of Feminist Legal Theory*, 87 *FORDHAM L. REV.* 977, 982 (2018) (stating that Ruth Bader Ginsburg was “winning lawsuits that would establish gender as something akin to a suspect class . . . and would soon render all gender distinctions in federal and state law presumptively unconstitutional”).

2. See Daphna Joel & Cordelia Fine, Opinion, *Can We Finally Stop Talking About ‘Male’ and ‘Female’ Brains?*, *N.Y. TIMES* (Dec. 3, 2018), <https://www.nytimes.com/2018/12/03/opinion/male-female-brains-mosaic.html> [<https://perma.cc/JKQ4-6ANV>]. The Barnard Center for Research on Women devoted an entire issue to this research. See generally Rebecca Jordan-Young, Giordana Grossi & Gina Rippon, *Introduction: Fifty Shades of Grey Matter*, *SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS* (2019), <http://sfoonline.barnard.edu/neurogenderings/introduction-fifty-shades-of-grey-matter> [<https://perma.cc/J6HW-FQPN>] (introducing a series of articles on scientific issues about sex, gender, and brains); GINA RIPPON, *THE GENDERED BRAIN* (2019) (discussing the history of sex-difference research); see also Larry Cahill, *Denying the Neuroscience of Sex Differences*, *QUILLETTE* (Mar. 29, 2019) [hereinafter Cahill, *Denying the Neuroscience*], <https://quillette.com/2019/03/29/denying-the-neuroscience-of-sex-differences> [<https://perma.cc/8FTQ-PVYV>] (introducing the scientific debate on sex differences in brains and arguing that differences do exist).

3. See Cahill, *Denying the Neuroscience*, *supra* note 2.

4. See Joel & Fine, *supra* note 2.

and autism.⁵ The fear is that this research will reinforce gender stereotypes, bias, and discrimination, while also advancing arguments of biological determinism.⁶

Fears notwithstanding, research into sex-based brain differences continues. Scientists have described accounting for sex as a biological variable as “fundamental to rigorous, and relevant, biomedical research.”⁷ Consistent with this view, the National Institutes of Health in 2016 implemented a policy that requires grant applicants to consider “sex as a biological variable” in vertebrate animal and human studies.⁸

Relatedly, scientists have begun to explore whether sex differences in the brain may help explain some observed population differences in cognition and behavior between men and women. Scientists have documented sex-biased differences⁹ in areas such as emotion, memory, pain perception, facial identification, and

5. This line of research is an outgrowth of the movement toward precision-based therapies. See Claudette Elise Brooks & Janine Austin Clayton, *Sex/Gender Influences on the Nervous System: Basic Steps Toward Clinical Progress*, 95 J. NEUROSCI. RSCH. 14, 16 (2017); Jill B. Becker, Michele L. McClellan & Beth Glover Reed, *Sex Differences, Gender and Addiction*, 95 J. NEUROSCI. RSCH. 136, 143 (2017). This fundamental shift in research focus is reflected in the themed issue of the *Journal of Neuroscience Research*, which is devoted entirely to the issue of sex influences on the brain and nervous system functioning. See generally 95 J. NEUROSCI. RSCH. 1 (2017).

6. See Joel & Fine, *supra* note 2; see also Jordan-Young et al., *supra* note 2 (noting that feminist language and histories “have been coopted to advance reductive and biologically deterministic claims”).

7. Brooks & Clayton, *supra* note 5, at 14.

8. NAT’L INST. OF HEALTH, CONSIDERATION OF SEX AS A BIOLOGICAL VARIABLE IN NIH-FUNDED RESEARCH (June 9, 2015), <https://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-102.html> [<https://perma.cc/FQC6-ZX8V>]. This policy provoked various objections from the field, including concern for how the policy might strengthen biases based on sex and gender and could disregard feminist considerations on sex and gender in the fields of health and biology. See Nur Zeynep Gungor, Annie Duchesne & Robyn Bluhm, *A Conversation Around the Integration of Sex and Gender When Modeling Aspects of Fear, Anxiety, and PTSD in Animals*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfonline.barnard.edu/neurogenderings/a-conversation-around-the-integration-of-sex-and-gender-when-modeling-aspects-of-fear-anxiety-and-ptsd-in-animals> [<https://perma.cc/3ACT-J7T4>]; Heather Shattuck-Heidorn & Sarah S. Richardson, *Sex/Gender and the Biosocial Turn*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfonline.barnard.edu/neurogenderings/sex-gender-and-the-biosocial-turn> [<https://perma.cc/SMA4-HLH5>] (arguing that to require documentation of sex differences in preclinical research would underplay the effects of gender as a biosocial variable).

9. I use the term “sex-based” (or sexually dimorphic) to refer to physical traits of an organism that are indicative of its biological sex and the term “sex-biased” to refer to traits, patterns, or conditions exaggerated in one sex, but that can show varying degrees of overlap. See Franck Mauvais-Jarvis, Arthur P. Arnold & Karen Reue, *A Guide for the Design of Pre-Clinical Studies on Sex Differences in Metabolism*, 25 CELL METABOLISM 1216, 1216 (2017); Margaret M. McCarthy et al., *Sex Differences in the Brain: The Not So Inconvenient Truth*, 32 J. NEUROSCI. 2241, 2241–42 (2012).

visuospatial skills.¹⁰ This line of research is also highly controversial. For a long time, the neuroscience community largely attributed any observed sex-associated population differences in cognition and behavior to the effects of cultural and social factors. Some scientists believe that sex-linked differences may contribute to, but do not comprise all of, the numerous factors that account for behavioral differences.¹¹ In light of the developing research on sex-based brain differences, other scientists have begun to place more weight on biological factors to explain variations in behavior and cognition.¹²

This Article does not attempt to resolve these debates. Instead, assuming that science teaches us that sex may affect certain brain functions, disorders, and behaviors, this Article explores whether such average differences should matter in law, particularly in tort law. Courts must first decide whether to accept these studies as legally admissible evidence. Assuming they do—a large assumption, given the research is in its early stages and is surrounded by controversy—courts

10. See Larry Cahill, *Why Sex Matters for Neuroscience*, 7 NATURE REV. NEUROSCI. 477, *1 (2006) [hereinafter Cahill, *Why Sex Matters*] [<https://perma.cc/3ZP6-B5NW>]. But see Vanessa Bentley et al., *Improving Practices for Investigating Spatial “Stuff”: Part I: Critical Gender Perspectives on Current Research Practices*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfoonline.barnard.edu/neurogenderings/improving-practices-for-investigating-spatial-stuff-part-i-critical-gender-perspectives-on-current-research-practices> [<https://perma.cc/RRN5-82W9>] (challenging findings of sex differences in spatial ability and arguing that gender disparities cannot be explained by biological factors alone).

11. As some scholars have noted about this research,

[T]hese papers do not eschew the idea that sex-linked biology has effects on brain development or functioning, but they do challenge the idea that sex or gender are binary, fixed, unitary phenomena. They most especially challenge the idea that ‘neuroscience’ or ‘sex biology’ indicate that social formations related to gender and sexuality proceed from something about structural or functional differences in our brains.

Jordan-Young et al., *supra* note 2; see also Annelies Kleinherenbrink, Vanessa Bentley & Sigrid Schmitz, *Plasticity and Spatial Stuff Under Western Neoliberal Order*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfoonline.barnard.edu/neurogenderings/plasticity-and-spatial-stuff-under-western-neoliberal-order> [<https://perma.cc/5D9D-BHSR>] (arguing that “the brain should certainly be embraced as a valuable source of knowledge,” but also “recognizing the role of contextual factors” that contribute to differences in neurological and behavioral outcomes).

12. Research in this area does not support the gross generalization that there are “male” brains and “female” brains or “male” natures and “female” natures. Jordan-Young et al., *supra* note 2; see Katherine Bryant, Giordana Grossi & Anelis Kaiser, *Feminist Interventions on the Sex/Gender Question in Neuroimaging Research*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfoonline.barnard.edu/neurogenderings/feminist-interventions-on-the-sex-gender-question-in-neuroimaging-research> [<https://perma.cc/J47K-E82K>] (noting that the field is “fraught with interpretational problems” and arguing that scientists should eschew dichotomization inherent in sex/gender research). Most scientists agree that “[b]rains and behavior are the product of the combined, continuous interactions of innumerable causal influences, that include, but go well beyond, sex-linked factors.” See Joel & Fine, *supra* note 2.

must next decide whether society *should* recognize these sex-based brain differences in legal and policy applications.

While the debate is ongoing about when these studies will be ready for courtroom use, litigants will no doubt seek to introduce such evidence in the near future.¹³ They may do so in various legal settings, but fundamentally, the legal system must confront whether it wants to have a universal standard of behavior that applies neutrally in all settings or whether it will recognize documented average differences that may be relevant to perception and experience.¹⁴ Because research on sex-based brain differences continues, courts need to grapple with its implications. This Article argues that when the scientific evidence shows sex-based distinctions in emotional distress responses, it may demand reconsideration of the reasonable person standard in the emotional harm context.

Part I summarizes some relevant neuroscience and social science research regarding sex-based brain differences pertaining to the search for the physiological origins of emotional harm. The focus of this Part is on research related to reactions to extreme stress, trauma, and the storage of emotional memory, which may inform the elements of certain torts involving emotional injury. Part II discusses the reasonable person standard in tort law, which has been both lauded as a neutral, objective standard, and criticized for failing to reflect diversity of perspectives. Part III analyzes the potential use of neuroscience research in the context of two freestanding tort claims linked to experiences and reactions to emotional harm, negligent infliction of emotional distress (“NIED”) generally, and intentional infliction of emotional distress (“IIED”) specifically, in the context of workplace harassment. Generally, the law eschews categorical evidence, but Part III concludes that documentation of some sex-based brain differences linked to average population differences in perception and processing of emotional experiences could support the use of sex-based standards of reasonableness in these limited contexts.

13. Litigants have begun to introduce neuroscience evidence in various areas of law. See Francis X. Shen, *Law and Neuroscience 2.0*, 48 ARIZ. ST. L.J. 1043, 1048–49 (2016).

14. A word on vocabulary: As is commonly accepted, this Article refers to “sex” as a biological concept and uses the term “gender” as a social construct. See Rebecca A. Nebel et al., *Understanding the Impact of Sex and Gender in Alzheimer’s Disease: A Call to Action*, 14 ALZHEIMER’S & DEMENTIA 1171, 1172 (2018); Becker et al., *supra* note 5, at 136. The issues discussed in this Article may have potentially unique implications for transgender or intersex individuals, but this is beyond the scope of this Article. The neuroscience studies on sex-based brain differences are less developed with regard to transgender or intersex individuals; as the science develops, further writings could explore this issue more fully. See *infra* note 24.

Borrowing from the blended standard applied to children in negligence cases, this approach would recognize certain average empirical differences documented in science but avoid creating more room for bias and discrimination. At the least, courts may allow jurors to consider this evidence in applying a general reasonableness standard to emotional harm claims.

Cautions

Before examining some of the research identifying sex-based brain differences, a few words of caution are in order.¹⁵ The brain is proving to be a mix of sex-based similarities and differences at all levels of its function.¹⁶ Although neuroscience studies seek to identify differences, they do not claim to suggest or assign value.¹⁷ While the studies recognize that there is a complicated interaction between biological sex differences and environmental and sociocultural factors,¹⁸ they do not suggest that sex-based brain differences deprive individuals of their agency.¹⁹ Moreover, the studies observing sex-biased brain disorders, and sex-biased cognitive and behavioral

15. For an excellent overview of the challenges of interpreting the studies in this area, see Cordelia Fine, Daphna Joel & Gina Rippon, *Eight Things You Need To Know About Sex, Gender, Brains, and Behavior: A Guide for Academics, Journalists, Parents, Gender Diversity Advocates, Social Justice Warriors, Tweeters, Facebookers, and Everyone Else*, SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS (2019), <http://sfonline.barnard.edu/neurogenderings/eight-things-you-need-to-know-about-sex-gender-brains-and-behavior-a-guide-for-academics-journalists-parents-gender-diversity-advocates-social-justice-warriors-tweeters-facebookers-and-ever> [https://perma.cc/63YA-ASUB].

16. Ruben C. Gur & Raquel E. Gur, *Complementarity of Sex Differences in Brain and Behavior: From Laterality to Multimodal Neuroimaging*, 95 J. NEUROSCI. RSCH. 189, 189 (2017) [hereinafter Gur & Gur, *Complementarity*].

17. See Larry Cahill, *An Issue Whose Time Has Come*, 95 J. NEUROSCI. RSCH. 12, 12 (2017) (stating that many neuroscientists feared that in pursuing this research “establishing that males and females are not the same in some aspect of brain function meant establishing that they were not equal . . . [an] assumption [that] is false and deeply harmful”).

18. See Becker et al., *supra* note 5, at 137, 142, 143. Some scientists have suggested that sex differences may have roots in evolution. See Leonardo Christov-Moore et al., *Empathy: Gender Effects in Brain and Behavior*, 46 NEUROSCI. & BIOBEHAV. REVS. 604, 604–06 (2014). Sex differences in neurochemistry and hormonal levels have also been partially attributed to evolution forces driving specific changes in animal behavior. See Shelley E. Taylor et al., *Biobehavioral Responses to Stress in Females: Tend-and-Befriend, Not Fight-or-Flight*, 107 PSYCH. REV. 411, 411 (2000). Discussion of these results requires careful attention to and caution against propagating neurosexism. Linda McClain, *Nature, Culture, and Social Engineering: Reflections on Evolution and Equality*, in NOMOS: EVOLUTION AND MORALITY 347, 359, 365–66 (2012). One danger of the essentialism line of thinking is that it fails to take into account neuroplasticity and lifetime experiences. See Bentley et al., *supra* note 10.

19. See Becker et al., *supra* note 5, at 137.

differences, denote population averages.²⁰ The research examines average differences of a group of subjects as compared to another group of subjects. There are always overlaps between the distributions for male and female data studied.²¹ In other words, women on average may exhibit greater cognitive abilities in certain areas, but that does not mean that men never demonstrate those same abilities. Similarly, women may on average exhibit a greater susceptibility to certain conditions or brain disorders, but that does not mean that men never exhibit the same conditions or disorders.²² Even if performance on certain tasks is the same on average between men and women, there may be sex-based differences in neural activities in completing the task.²³

Further, numerous other issues require caution.²⁴ Perhaps most significantly, it is critical to avoid “neurosexism”—giving into sex-based stereotypes, viewing differences as limitations, or failing to recognize differences as cultural or social rather than biological—when

20. See Joel & Fine, *supra* note 2 (acknowledging that there are group-level differences in brain and behavior and noting the important difference between group-level and individual-level phenomena).

21. See Bryant et al., *supra* note 12 (“[F]eminist scientists have invited us to pay more attention to intra-sex/gender variability and inter-sex/gender overlap, rather than using sex/gender as a dichotomous variable . . .”).

22. See Stuart J. Ritchie et al., *Sex Differences in the Adult Human Brain: Evidence from 5216 UK Biobank Participants*, 28 *CEREBRAL CORTEX* 2959, 2960 (2018).

23. Cahill, *Why Sex Matters*, *supra* note 10, at *2; see generally Bryant et al., *supra* note 12 (criticizing research in this field and calling for interventions such as “running empirical tests of randomization control and permutation analyses to protect against false positives, calculating measures of both difference . . . and overlap/similarity between groups, and reporting null results”).

24. For example, the stereotype threat effect, in which stereotypes can affect behavior, requires caution when reporting observed group differences. See Bentley et al., *supra* note 10. Furthermore, our societal view of sex and gender is changing, and neuroscience research could ultimately reject a binary paradigm of sex-based brain differences. See Becker et al., *supra* note 5, at 142; Nienke M. Nota et al., *Brain Functional Connectivity Patterns in Children and Adolescents with Gender Dysphoria: Sex-Atypical or Not?*, 86 *PSYCHONEUROENDOCRINOLOGY* 187, 187, 193–94 (2017). Slippery slope issues in law abound—for instance, we do not want to open the door to allowing employers to use data on sex-based brain differences for privileging hiring in a field. This would be reminiscent of debates of earlier generations surrounding hiring male nurses or male flight attendants. See Leslie M. Kerns, *A Feminist Perspective: Why Feminists Should Give the Reasonable Woman Standard Another Chance*, 10 *COLUM. J. GENDER & L.* 195, 200, 213–14, 219 (2001) (describing the evolution of the reasonable man standard to the reasonable person standard, that ignores sex disparities in economic and professional status as a result of women being pigeonholed into “feminized” labor sectors, which required little professional education and provided for little mobility or pay).

engaging in these topics.²⁵ Research in these areas is ever-changing, and, as such, one should exercise humility when offering suggestions.

I. SELECTIVE FINDINGS OF SEX-BASED DIFFERENCES IN BRAIN STRUCTURE, FUNCTION, AND BEHAVIOR

This Part highlights some developing research on sex-based differences in brain structure, function, and behavior. While not comprehensive, it selectively features some of the findings that might implicate tort law, especially studies of sex-biased influences on emotional memory, trauma, and stress effects. Those studies may have important implications for the torts that are the focus of Part III: NIED and IIED in the context of a hostile work environment. This Part is necessarily a snapshot as the ongoing research is significant and expanding all the time.

A. *Sex-Based Differences in Brain Structure and Function*

To begin to understand some of these studies, some definitional categories are in order. Male and female brains can differ from each other in several ways, and not all sex differences in the brain develop or are expressed in the same way.²⁶ One widely accepted methodology creates three categories of sex-based brain differences:

(1) Qualitative sex differences (or sexual dimorphism): sex differences that cannot be measured on the same scale (for example, features related to reproduction);

(2) Quantitative sex differences: average behavioral sex differences for which the neural mechanisms are the same (for example, women generally have greater verbal fluency and men generally perform better on spatial function tasks); and

(3) Convergent sex differences: average sex differences which cause males and females to exhibit similar behavioral outcomes but through different neural mechanisms (for example, men and women

25. See M.E. Kret & B. De Gelder, *A Review on Sex Differences in Processing Emotional Signals*, 50 *NEUROPSYCHOLOGIA* 1211, 1211–12 (2012) (criticizing the field for reaching conclusions that reflect stereotypes, even when data could be interpreted in many ways); Becker et al., *supra* note 5, at 142; Deboleena Roy, *About this Issue*, *SCHOLAR & FEMINIST ONLINE: NEUROGENDERINGS* (2019), <http://sfoonline.barnard.edu/neurogenderings/about-this-issue> [<https://perma.cc/N23Y-CTSJ>] (discussing the need to “move us beyond essentializing and biologically deterministic frameworks”).

26. See Becker et al., *supra* note 5, at 141.

may draw on different hormones to lead to compulsive drug use and addiction).²⁷

The third category is noteworthy because it demonstrates that observed structural and functional brain differences do not necessarily lead to sex-based differences in behavioral outcomes.²⁸

Research suggests that sex differences in the brain are widespread; they “exist in every brain lobe, including in many ‘cognitive’ regions such as the hippocampus, amygdala and neocortex.”²⁹ Some sex-based brain differences are global in nature. For example, after controlling for height and weight, men have larger brain volumes overall compared to women.³⁰ Even accounting for this difference in volume, women appear to have increased gray matter while men have increased white matter.³¹ Most sex-based differences are not in the anatomical structure, but instead are reflected in a functional way, such as through neurotransmitter function.³² For example, women on average have higher cerebral blood flow than men during cognitive activity and during rest.³³

This Section addresses some of the aspects of the brain that may be different for men and women and could conceivably affect legal outcomes in tort law, particularly with regard to emotional injury. In each of the following subsections, this Article discusses what each part of the brain is associated with, the biological differences between men

27. McCarthy et al., *supra* note 9, at 2241–47; Becker et al., *supra* note 5, at 141–42. McCarthy also includes in the third category, “sex convergence and divergence.” McCarthy et al., *supra* note 9, at 2242. Becker adds a fourth category, population (normative) sex differences, which describes when the average number of males/females with a feature or outcome differ. For example, more males are mathematicians than females, which may be explained by individual experiences and sociocultural factors that can affect males and females differently. Becker et al., *supra* note 5, at 141–42. Noting that the field is “fraught with interpretational problems,” Bryant suggests that differences in traits should be referred to as sex differences, reserving dimorphism labels only when traits in males and females do not overlap. Bryant et al., *supra* note 12.

28. Cahill, *Why Sex Matters*, *supra* note 10, at *2.

29. See Zeenat F. Zaidi, *Gender Differences in Human Brain: A Review*, 2 OPEN ANATOMY J. 37, 39 n.37 (2010) <https://benthamopen.com/contents/pdf/TOANATJ/TOANATJ-2-37.pdf> [<https://perma.cc/989C-BHNW>].

30. Jay N. Giedd et al., *Quantitative Magnetic Resonance Imaging of Human Brain Development: Ages 4–18*, 6 CEREBRAL CORTEX 551, 551–60 (1996).

31. Kelly P. Cosgrove, Carolyn M. Mazure & Julie K. Staley, *Evolving Knowledge of Sex Differences in Brain Structure, Function, and Chemistry*, 62 BIOLOGICAL PSYCH. 847, 847 (2007); John S. Allen et al., *Sexual Dimorphism and Asymmetries in the Gray-White Composition of the Human Cerebrum*, 18 NEUROIMAGE 880, 880–81 (2003); cf. Bryant et al., *supra* note 12 (arguing that “difference . . . is only valid when appropriate statistical corrections for body size are applied” and noting replication problems and methodological disagreement within the field).

32. Cahill, *Why Sex Matters*, *supra* note 10, at *2.

33. Cosgrove et al., *supra* note 31.

and women research is uncovering, and the possible implications of how these differences might portray themselves in behavior, especially with regard to experiencing extreme stress and emotional memories.

1. *Hippocampus*. The hippocampus plays a major role in learning and memory.³⁴ Like many other structures in the brain, it is a paired structure, with one in each brain hemisphere. Neuroscience studies show that male and female hippocampi differ on average in their structure, their neurochemistry, and their response to stressors.³⁵ Imaging results suggest that females generally have larger hippocampal size,³⁶ which may have genetic underpinnings.³⁷ The right hippocampus is generally larger in both sexes, but a female's left hippocampus appears to grow more throughout development—making fully developed female hippocampi more symmetrical than male hippocampi.³⁸ However, hippocampal growth is generally quite dynamic during development and a function of sex and stress hormones.³⁹ Since abnormal hippocampal asymmetry has been associated with memory and cognitive impairments, as well as neuropsychological disorders, research in this area could be relevant to brain impairments such as PTSD and clinical depression.⁴⁰

34. *Id.*

35. *Id.*; but see Bryant et al., *supra* note 12 (“[H]ippocamp[i] . . . are not sexually dimorphic as previously claimed.”).

36. Cahill, *Why Sex Matters*, *supra* note 10, at *2–5; see also Ruben C. Gur, Tamara Bockow & Raquel E. Gur, *Gender Differences in the Functional Organization of the Brain*, in *PRINCIPLES OF GENDER-SPECIFIC MEDICINE* 75, 80 (2d ed. 2010) (noting that in his studies, “Cahill concludes that imaging studies consistently find that the hippocampus is larger in women compared to men when adjusted for brain size.”). However, a recent study and meta-analysis of MRI images concludes that there are no sex differences in hippocampal volume. Gabor Perlaki et al., *Are There Any Gender Differences in the Hippocampus Volume After Head-Size Correction? A Volumetric and Voxel-Based Morphometric Study*, 570 *NEUROSCI. LETTERS* 119, 119 (2014) (study); Anh Tan et al., *The Human Hippocampus Is Not Sexually-Dimorphic: Meta-Analysis of Structural MRI Volumes*, 124 *NEUROIMAGE* 350, 350 (2016) (meta-analysis).

37. Chris Armoskus et al., *Identification of Sexually Dimorphic Genes in the Neonatal Mouse Cortex and Hippocampus*, 1562 *BRAIN RSCH.* 23, 23 (2014).

38. Akiko Uematsu et al., *Developmental Trajectories of Amygdala and Hippocampus from Infancy to Early Adulthood in Healthy Individuals*, 7 *PLOS ONE* *1, *6–7 (2012), <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046970&type=printable> [<https://perma.cc/53DU-F9SS>].

39. L. A. M. Galea et al., *Sex, Hormones and Neurogenesis in the Hippocampus: Hormonal Modulation of Neurogenesis and Potential Functional Implications*, 25 *J. NEUROENDOCRINOLOGY* 1039, 1039 (2013).

40. Deanne K. Thompson et al., *MR-Determined Hippocampal Asymmetry in Full-Term and Preterm Neonates*, 19 *HIPPOCAMPUS* 118, 119 (2009) (noting that preterm infants experiencing stressors, and thus potentially implicating hippocampal development, “often have cognitive and learning deficits, memory impairments, and increased risk of neuropsychological

Additionally, chronic stress affects the hippocampus cells, which may have a role in these disorders and may exhibit sex differences as well.⁴¹

Further, scientists have found sex-based differences in the hippocampus neurotransmitter systems—the body’s chemical messengers—when responding to stress.⁴² One review of over fifty functional nuclear magnetic resonance imaging (“fMRI”) experiments found greater stimulation of these chemical messengers in the hippocampi of women in response to visually observed emotional stimuli.⁴³ Other fMRI studies have shown similar results, which reinforces the idea that sex differences in the hippocampus play a role in PTSD and similar disorders.⁴⁴

2. *Amygdala.* The amygdala, which plays a significant role in emotional arousal and recalling emotional experiences, is implicated in a variety of neurological and psychiatric conditions.⁴⁵ It is a paired structure, located in the brain’s left and right hemispheres, with demonstrated sex-based structural and functional differences. First, the amygdala is generally larger in men than in women, when

disorders such as attention deficit hyperactivity disorder”). While people with stress-related and other neuropsychological disorders consistently are shown to have smaller hippocampi, *see* Tan et al., *supra* note 36, at 350, one study suggests that smaller size is a vulnerability for stress disorders and not a consequence. Lenita Lindgren, Jan Bergdahl & Lars Nyberg, *Longitudinal Evidence for Smaller Hippocampus Volume as a Vulnerability Factor for Perceived Stress*, 26 CEREBRAL CORTEX 3527, 3528 (2016).

41. Cahill, *Why Sex Matters*, *supra* note 10, at *3.

42. *Id.*

43. Megan M. Filkowski et al., *Sex Differences in Emotional Perception: Meta Analysis of Divergent Activation*, 147 NEUROIMAGE 925, 926, 929 (2017). Similar differences have been demonstrated in male and female rats. Bruce S. McEwen & Teresa A. Milner, *Understanding the Broad Influence of Sex Hormones and Sex Differences in the Brain*, 95 J. NEUROSCI. RSCH. 24, 29 (2017).

44. Matthew Bellace, J. Michael Williams, Feroze B. Mohamed & Scott H. Faro, *An fMRI Study of the Activation of the Hippocampus by Emotional Memory*, 123 INT’L. J. NEUROSCI. 121, *4–5 (2013) [<https://perma.cc/W2BP-L9KS>] (showing hippocampal response sex differences in human subjects resulting from exposure to emotional stimuli, including words and images). In one study, decreasing left hippocampal size appeared connected with verbal memory decline in women, but decreasing bilateral hippocampus size had no link to memory decline in men. Martin A. Ystad et al., *Hippocampal Volumes Are Important Predictors for Memory Function in Elderly Women*, 9 BMC MED. IMAGING 17, *11–12 (2009), <https://bmcmimedimaging.biomedcentral.com/track/pdf/10.1186/1471-2342-9-17> [<https://perma.cc/CEV5-EVUH>].

45. *See generally* Elizabeth I. Martin, Kerry J. Ressler, Elisabeth Binder & Charles B. Nemeroff, *The Neurobiology of Anxiety Disorders: Brain Imaging, Genetics, and Psychoneuroendocrinology*, 32 PSYCHIATRIC CLINICS N. AM. 549 (2009) (discussing the role of the amygdala in mood and other anxiety disorders).

controlling for brain size,⁴⁶ even during development.⁴⁷ Second, the amygdala appears to develop earlier and faster in females than in males.⁴⁸ Third, males appear to have larger right amygdala, but females do not exhibit the same asymmetry.⁴⁹

Moreover, neuroscience studies have found sex-based functional differences in the amygdala as it pertains to the creation and retention of emotional memories.⁵⁰ For example, males and females respond differently in the left or right amygdala to emotional stimulation.⁵¹ A meta-analysis of brain scan studies showed greater stimulation of the left amygdala in women in response to visually observed emotional stimuli, and the right amygdala in men.⁵²

The amygdala is also associated with aggressive behavior.⁵³ One study discovered a mechanism for how male sex steroids (hormones)

46. Jill M. Goldstein et al., *Normal Sexual Dimorphism of the Adult Human Brain Assessed by In Vivo Magnetic Resonance Imaging*, 11 CEREBRAL CORTEX 490, 492 (2001); Ritchie et al., *supra* note 22, at 2969.

47. See Uematsu et al., *supra* note 38, at *6. However, one meta-analysis found no significant difference in amygdala size between sexes when controlling for overall brain size differences. See generally Dhruv Marwha, Meha Halari & Lise Eliot, *Meta-Analysis Reveals a Lack of Sexual Dimorphism in Human Amygdala Volume*, 147 NEUROIMAGE 282 (2017) (stating that amygdala volume “is not selectively enhanced in human males, as often claimed”). Another study found only moderate sex differences in amygdala size. See Lutz Jäncke, Susan Mérillat, Franziskus Liem & Jürgen Hänggi, *Brain Size, Sex, and the Aging Brain*, 36 HUMAN BRAIN MAPPING 150, 160, 163 (2015).

48. Uematsu et al., *supra* note 38, at *6.

49. *Id.* at *8. Data from rat models suggests that sex-based differences may occur early in development and vary further with puberty and sexual experience. Mariana Zancan et al., *Remodeling of the Number and Structure of Dendritic Spines in the Medial Amygdala: From Prepubertal Sexual Dimorphism to Puberty and Effect of Sexual Experience in Male Rats*, 48 EUR. J. NEUROSCI. 1851, 1861 (2018).

50. See Jennifer S. Stevens & Stephan Hamann, *Sex Differences in Brain Activation to Emotional Stimuli: A Meta-Analysis of Neuroimaging Studies*, 50 NEUROPSYCHOLOGIA 1578, 1588 (2012); Cahill, *Why Sex Matters*, *supra* note 10, at *4.

51. Cahill, *Why Sex Matters*, *supra* note 10, at *4.

52. See Filkowski et al., *supra* note 43, at 929. Laterality may explain why individuals are better able to recognize correctly the facial expressions in faces of their own sex: When recalling fearful faces of one’s sex, the left amygdala tends to be more active in women while the right amygdala shows greater activity in men. Kret et al., *supra* note 25, at 1216. Additionally, testosterone appears to increase the reactivity of the amygdala, though testosterone and progesterone appear to influence the amygdala’s connection with other regions of the brain in diverging ways. G. A. van Wingen et al., *Gonadal Hormone Regulation of the Emotion Circuitry in Humans*, 191 NEUROSCI. 38, 43 (2011).

53. See generally Maria Mpakopoulou et al., *Stereotactic Amygdalotomy in the Management of Severe Aggressive Behavioral Disorders*, 25 NEUROSURGICAL FOCUS 1 (2008) (discussing the surgical treatment of amygdala for severe aggressive behavioral disorders).

play a role in amygdala development and differences in behavior.⁵⁴ The research studied the brains of male rats to see how sex steroids could produce behavioral differences such as greater aggression and rougher play behavior in juveniles. A key contributor to the differences in play behavior is a sex-based difference in the number of newborn cells in the amygdala. The research showed that the male rats had fewer of these newborn cells because immune cells—activated by testosterone—actively eliminated them. In other words, fewer newborn cells led to more aggressive behavior.⁵⁵

3. *Prefrontal Cortex.* The most important function of the prefrontal cortex is decision-making. Additionally, it is associated with responses to stress and anxiety.⁵⁶ The prefrontal cortex may develop at different rates in men and women.⁵⁷ There may also be sex-based differences in how the prefrontal cortex responds to emotional stimuli. For example, in one meta-study, men demonstrated greater stimulation in the prefrontal cortex in response to visually observed emotional stimuli.⁵⁸

One section of the prefrontal cortex, known as the medial prefrontal cortex, is associated with PTSD and anxiety.⁵⁹ The signaling

54. See generally Jonathan W. VanRyzin et al., *Microglial Phagocytosis of Newborn Cells Is Induced by Endocannabinoids and Sculpts Sex Differences in Juvenile Rat Social Play*, 102 NEURON 435 (2019) (“Steroid-mediated masculinization of the rat amygdala during perinatal development produces higher levels of juvenile rough-and-tumble play by males.”).

55. *Id.* The functioning of the amygdala likely plays a role in bipolar disorder. See Leslie A. Hulvershorn et al., *Neural Activation During Facial Emotion Processing in Unmedicated Bipolar Depression, Euthymia, and Mania*, 71 BIOLOGICAL PSYCH. 603, 607 (2012). Age may further implicate sex differences in this condition. Yanqing Tang et al., *Age-Specific Effects of Structural and Functional Connectivity in Prefrontal-Amygdala Circuitry in Women with Bipolar Disorder*, 18 BMC PSYCH. 177, *4–6 (2018), <https://bmcp psychiatry.biomedcentral.com/track/pdf/10.1186/s12888-018-1732-9> [<https://perma.cc/LCN8-3J5C>].

56. Ruud van den Bos, Judith Homberg & Leonie de Visser, *A Critical Review of Sex Differences in Decision-Making Tasks: Focus on the Iowa Gambling Task*, 238 BEHAV. BRAIN RSCH. 95, 100, 102 (2013).

57. See Kelly L. Evans & Elizabeth Hampson, *Sex Differences on Prefrontally-Dependent Cognitive Tasks*, 93 BRAIN & COGNITION 42, 43 (2015) (citing several studies that suggest that the male advantage in object reversal may be attributed to “only a short-term difference in developmental timing”); see also *id.* at 49 (suggesting evidence that males may perform better in prefrontal-cortex-associated decision-making activities involving optimizing outcomes by preferring options with more long-term advantages).

58. A review of over fifty brain scan studies found greater stimulation in one section of the prefrontal cortex, the medial prefrontal cortex, in men in response to visually observed emotional stimuli. Filkowski et al., *supra* note 43, at 926, 928.

59. Michael Koenigs & Jordan Grafman, *Post-Traumatic Stress Disorder: The Role of Medial Prefrontal Cortex and Amygdala*, 15 NEUROSCIENTIST 540, *1 (2009) [<https://perma.cc/T2DJ-2RQH>].

pathways—a chain of chemical reactions to transmit information—in the medial prefrontal cortex likely play an important role in psychiatric disorders.⁶⁰ Rat studies show greater social anxiety in females that scientists can modulate by experimentally amplifying certain signaling pathways in the medial prefrontal cortex.⁶¹ One study suggests that the medial prefrontal cortex function related to controlling learned fear may be more effective in male rats, implicating mechanisms involved in PTSD.⁶²

4. *Neurochemistry*. Studies have shown sexual dimorphisms in a number of neurotransmitter systems.⁶³ Two important neurotransmitters are dopamine and serotonin.⁶⁴ Dopamine regulates mood and plays a vital role in the brain's pleasure and reward system, while serotonin helps regulate one's mood, sleep cycle, and appetite.⁶⁵ Having too much or too little of either neurotransmitter can cause psychological and physical symptoms.⁶⁶ Overall, men appear to synthesize serotonin faster than women, which could explain the higher incidence of depression in women.⁶⁷ On the other hand, the

60. See Ezequiel Marron Fernandez de Velasco et al., *Sex Differences in GABA(B)R-GIRK Signaling in Layer 5/6 Pyramidal Neurons of the Mouse Prelimbic Cortex*, 95 NEUROPHARMACOLOGY 353, 357 (2015).

61. See N. Carrier & M. Kabbaj, *Sex Differences in Social Interaction Behaviors in Rats Are Mediated by Extracellular Signal-Regulated Kinase 2 Expression in the Medial Prefrontal Cortex*, 212 NEUROSCI. 86, 88, 90 (2012).

62. See Georgina E. Fenton et al., *Persistent Prelimbic Cortex Activity Contributes to Enhanced Learned Fear Expression in Females*, 21 LEARNING & MEMORY 55, 55 (2014). Other studies in rats point to few sex differences in medial prefrontal cortex- and amygdala-mediated fear control. Tina M. Gruene et al., *Sex-Specific Neuroanatomical Correlates of Fear Expression in Prefrontal-Amygdala Circuits*, 78 BIOLOGICAL PSYCH. 186, 191 (2015).

63. Cahill, *Why Sex Matters*, *supra* note 10, at *5 (listing neurotransmitter systems including serotonin, GABA, acetylcholine, vasopressin, opioid receptors, and monoamines). Some evidence suggests that there may be an age component related to sex differences as well. See generally Lara M. Wierenga et al., *Unraveling Age, Puberty and Testosterone Effects on Subcortical Brain Development Across Adolescence*, 91 PSYCHONEUROENDOCRINOLOGY 105, 105 (2018) (describing “the complex interactions between chronological age and pubertal maturational changes,” and finding “puberty unique changes in brain structure that are sex specific”).

64. Lusi Madisha, *Difference Between Serotonin and Dopamine*, DIFFERENCEBETWEEN.NET (Oct. 18, 2019), <http://www.differencebetween.net/science/health/difference-between-serotonin-and-dopamine> [https://perma.cc/FD4U-XZBQ].

65. *Id.*

66. *Id.*

67. S. Nishizawa et al., *Differences Between Males and Females in Rates of Serotonin Synthesis in Human Brain*, 94 PNAS 5308, 5312 (1997).

neurotransmission of dopamine appears to be more efficient and better controlled in women.⁶⁸

The role of hormones in sex-based brain differences is a significant area of study. Sex differences in the hormonal effects on brain organization have been shown in domains of executive function, memory, social cognition, and sensorimotor speed; the magnitude of sex differences increases between the ages of eleven and twenty-one.⁶⁹ Prenatal hormonal conditions also seem to play a critical role in dimorphic influences on brain development and behavioral outcomes.⁷⁰

Sex influences exist at all levels of the nervous system.⁷¹ One area of interest is stress response. Rat studies have revealed a number of “sex-specific mechanisms involved in stress responses,” suggesting a correlation between sex-based differences in stress hormone levels and sex-biased population rates of PTSD.⁷² Stress is also a major risk factor for depression and addiction.⁷³ Moreover, the influence of stress on emotional learning and memory processes “are thought to underlie stress-associated mental disorders.”⁷⁴

PTSD is linked to dysregulation of fear, including an increased fear response and a deficit in fear extinction involved in processing emotional memories.⁷⁵ Women are twice as likely as men to suffer from PTSD.⁷⁶ A recent study implicates the role of certain ovarian steroid

68. Cosgrove et al., *supra* note 31, at 851. This may have implications for the higher incidence of Parkinson’s disease in men. *Id.*

69. Raquel E. Gur & Ruben C. Gur, *Sex Differences in Brain and Behavior in Adolescence: Findings from the Philadelphia Neurodevelopmental Cohort*, 70 NEUROSCI. & BIOBEHAV. REVS. 159, 162 (2016) [hereinafter Gur & Gur, *Sex Differences*]. However, hormonal effects on brain organization “can dynamically change within relatively short periods throughout life” and not just during adolescence. Markus Hausmann, *Why Sex Hormones Matter for Neuroscience: A Very Short Review on Sex, Sex Hormones, and Functional Brain Asymmetries*, 95 J. NEUROSCI. RSCH. 40, 40 (2017).

70. Becker et al., *supra* note 5, at 142.

71. Cahill, *Why Sex Matters*, *supra* note 10, at *7.

72. Debra A. Bangasser & Brittany Wicks, *Sex-Specific Mechanisms for Responding to Stress*, 95 J. NEUROSCI. RSCH. 75, 75 (2017); cf. Gungor et al., *supra* note 8 (stating that hormones do not explain women’s greater PTSD risk, but they should be studied to improve our understanding of the neurobiology of fear processing in both men and women).

73. Abigail Laman-Maharg & Brian C. Trainor, *Stress, Sex, and Motivated Behaviors*, 95 J. NEUROSCI. RSCH. 83, 83 (2017).

74. Christian J. Merz & Oliver T. Wolf, *Sex Differences in Stress Effects on Emotional Learning*, 95 J. NEUROSCI. RSCH. 93, 93 (2017).

75. Meghna Ravi, Jennifer S. Stevens & Vasiliki Michopoulos, *Neuroendocrine Pathways Underlying Risk and Resilience to PTSD in Women*, 55 FRONTIERS IN NEUROENDOCRINOLOGY *1, *1 (2019) [<https://perma.cc/W2NC-A82S>].

76. *Id.* at *2.

hormones to explain the greater risk and dysregulation of fear psychophysiology that is associated with PTSD.⁷⁷

Finally, there may be neural mechanisms involved in observed sex-biased differences in drug use and addiction,⁷⁸ including the use and abuse of amphetamine⁷⁹ and opioids.⁸⁰

5. *Other Sex-Based Brain Differences.* Numerous other sex-based brain differences are worthy of note, including the cortex, which is the outer layer of neural tissue that surrounds the brain.⁸¹ Changes in cortical volume normally occur during brain development, and scientists have observed sex-based differences in the rate of volume change as well as cortical thickness.⁸² Variations in cortical volume changes may be associated with intelligence and risk for psychiatric disorders.⁸³ One study suggests that cortical maturation, which occurs more rapidly in women, may relate to observations of greater empathy in women.⁸⁴

Another example of sex-based brain differences occurs in the hypothalamus, a small area of the brain that plays an important role in hormone production.⁸⁵ It appears to be associated with aggressive behaviors in male mice, as ablating of a specific region of the

77. *See id.* (discussing the role of estradiol, progesterone, and allopregnanolone in fear psychophysiology).

78. *See* Becker et al., *supra* note 5, at 136.

79. *See* Marina Cholanian et al., *Digital Holographic Microscopy Discriminates Sex Differences in Medial Prefrontal Cortex GABA Neurons Following Amphetamine Sensitization*, 124 PHARMACOLOGY, BIOCHEMISTRY & BEHAV. 326, 331–32 (2014) (finding high estradiol in rats to be associated with greater behavioral hyperactivity following amphetamine treatment, which suggests a hormonal component behind sex differences in levels of drug use and addiction).

80. Cahill, *Why Sex Matters*, *supra* note 10, at *5 (citing J. K. Zubieta, R. F. Dannals & J. J. Frost, *Gender and Age Influences on Human Brain Mu-Opioid Receptor Binding Measured by PET*, 156 AM. J. PSYCH. 842, (1999)) (documenting sex differences in opioid peptides that bind to opioid receptors in the brain).

81. Khalid H. Jawabri & Sandeep Sharma, *Physiology, Cerebral Cortex Functions*, STATPEARLS (2019), <https://www.ncbi.nlm.nih.gov/books/NBK538496> [<https://perma.cc/TU9G-9MWA>].

82. Jay N. Giedd, Armin Raznahan, Kathryn L. Mills & Rhoshel K. Lenroot, *Review: Magnetic Resonance Imaging of Male/Female Differences in Human Adolescent Brain Anatomy*, 3 BIOLOGY OF SEX DIFFERENCES 19, *2 (2012), <https://bsd.biomedcentral.com/track/pdf/10.1186/2042-6410-3-19> [<https://perma.cc/RS2A-VXGN>]; Armin Raznahan et al., *How Does Your Cortex Grow?*, 31 J. NEUROSCI. 7174, 7176 (2011).

83. A. Kadir Mutlu et al., *Sex Differences in Thickness, and Folding Developments Throughout the Cortex*, 82 NEUROIMAGE 200, 204 (2013).

84. *See id.* at 203–05.

85. Robert M. Sargis, *An Overview of the Hypothalamus: The Endocrine System's Link to the Nervous System*, ENDOCRINEWEB (Apr. 8, 2015), <https://www.endocrineweb.com/endocrinology/overview-hypothalamus> [<https://perma.cc/UC72-FGFG>].

hypothalamus decreases aggression.⁸⁶ Research shows that the hypothalamus-pituitary-adrenal (“HPA”) axis activates faster and yields greater amounts of stress hormones in women.⁸⁷ This may have implications for sex-biased differences in compulsive drug use.⁸⁸

Further, one review of over fifty PET scan studies showed greater stimulation in women of the dorsal midbrain, a part of the brainstem where lower brain activity is associated with alertness and Parkinson’s disease, in response to visually observed emotional stimuli and perception.⁸⁹

Observed sex-based brain differences have led to a separate, but related, area of study—the relationship between those differences and observed population differences in behavior. Connecting brain differences to behavior is the heart of the controversy surrounding neuroscience studies on sex-based brain differences. This Article now turns to describing some of these studies.

B. Selective Sex-Biased Population Differences in Behavior

Scientists are beginning to explore whether sex-based brain differences may be related to population-based differences in behavior or brain disorders. As noted earlier, these are studies based on averages in the population and do not denote individual capacity or ability. Scientists have documented some average population sex-biased differences in cognitive behavior.⁹⁰ For example, measurements indicate females on average perform better than males on memory and social cognition tasks, and males perform better on spatial and motor

86. Cindy F. Yang et al., *Sexually Dimorphic Neurons in the Ventromedial Hypothalamus Govern Mating in Both Sexes and Aggression in Males*, 153 *CELL* 896, 898 (2013).

87. Nirupa Goel et al., *Sex Differences in the HPA Axis*, 4 *COMPREHENSIVE PHYSIOLOGY* 1121, 1145 (2014).

88. Samara A.M. Bobzean, Aliza K. DeNobrega & Linda I. Perrotti, *Sex Differences in the Neurobiology of Drug Addiction*, 259 *EXPERIMENTAL NEUROLOGY* 64, 69 (2014).

89. Filkowski et al., *supra* note 43, at 925 (stating that the study observed sex differences in emotional function in the brainstem for the first time). The corpus callosum (“CC”), which connects the left side of the brain to the right side, shows sex-based differences; on average, female CCs are larger than those of males. Ralph L. Holloway, *In the Trenches with the Corpus Callosum: Some Redux of Redux*, 95 *J. NEUROSCI. RSCH.* 11, 12 (2017). *But see* Bryant et al., *supra* note 12 (disputing findings of sex-based differences in CC). Abnormalities in the CC have been associated with autism spectrum disorder, Christine Wu Nordahl et al., *Sex Differences in the Corpus Callosum in Preschool-aged Children with Autism Spectrum Disorder*, 6 *MOL. AUTISM* 26, *8–10 (2015), <https://molecularautism.biomedcentral.com/track/pdf/10.1186/s13229-015-0005-4> [<https://perma.cc/2RL2-GWP2>], and bipolar disorder, Adrian J. Lloyd et al., *Corpus Callosum Changes in Euthymic Bipolar Affective Disorder*, 204 *BRIT. J. PSYCHIATRY* 129, 129 (2014).

90. Ritchie et al., *supra* note 22, at 2960; Gur & Gur, *Sex Differences*, *supra* note 69, at 159–60.

tasks.⁹¹ Furthermore, fMRI studies of inhibitory control, attention, working memory, and emotion processing in adolescents reveal sex-biased differences.⁹²

Numerous brain disorders and conditions demonstrate sex-biased population differences. Some evidence suggests that certain developmental disorders emerge early in life and are more prevalent in men, while anxiety and mood disorders emerge later in development and are more frequent in women.⁹³ In the general population, men have higher rates of autism,⁹⁴ attention-deficit/hyperactivity disorder (“ADHD”),⁹⁵ specific language impairment,⁹⁶ Tourette syndrome,⁹⁷ dyslexia,⁹⁸ schizophrenia,⁹⁹ and aggression.¹⁰⁰ Women have higher rates of depression,¹⁰¹ anorexia nervosa,¹⁰² PTSD,¹⁰³ addictive traits,¹⁰⁴ stroke,¹⁰⁵ autoimmune disorders,¹⁰⁶ Alzheimer’s disease,¹⁰⁷ and sensitivity to pain.¹⁰⁸

The challenge has been to determine the causal connection between the acknowledged differences in brain physiology and brain disorders or behavior. Despite the complexity of the inquiry, it has become an increasing focus of neuroscience research.¹⁰⁹ Scientists are beginning to suggest that underlying biological differences between

91. Gur & Gur, *Complementarity*, *supra* note 16, at 189.

92. Gur & Gur, *Sex Differences*, *supra* note 69, at 166.

93. *Id.* at 167.

94. McEwen & Milner, *supra* note 43, at 33.

95. Amber N.V. Ruigrok et al., *A Meta-Analysis of Sex Differences in Human Brain Structure*, 39 *NEUROSCI. & BEHAV. REVS.* 34, 35 (2014).

96. *Id.*

97. *Id.*

98. *Id.*

99. Kathryn M. Abel, Richard Drake & Jill M. Goldstein, *Sex Differences in Schizophrenia*, 22 *INTERNAL REV. PSYCHIATRY* 417, 417 (2010).

100. Gur & Gur, *Complementarity*, *supra* note 16, at 193.

101. Ruigrok et al., *supra* note 95, at 35.

102. *Id.*

103. Ravi et al., *supra* note 75; Bangasser & Wicks, *supra* note 72, at 75.

104. *See* Becker et al., *supra* note 5, at 136.

105. *See* Brooks & Clayton, *supra* note 5, at 15.

106. *See id.*

107. *See id.*

108. McEwen & Milner, *supra* note 43, at 33; Robert Y. North et al., *Electrophysiological and Transcriptomic Correlates of Neuropathic Pain in Human Dorsal Root Ganglion Nerves*, 142 *BRAIN* 1215, 1224 (2019) (suggesting that the presence of sex-specific differences in immune response and neuronal plasticity is related to radicular/neuropathic pain); *see* Patti Neighmond, *Women May Be More Adept Than Men at Discerning Pain*, NPR (Aug. 26, 2019, 5:06 AM), <https://www.npr.org/741926952> [<https://perma.cc/D48E-MG34>].

109. *See* Gur & Gur, *Complementarity*, *supra* note 16, at 189.

male and female brains could help explain some differences in the prevalence of mental disorders and cognitive and behavioral differences. As a leading scientist in this area has said, “[t]he mere existence of sex differences in the incidence and/or nature of a disorder requires us to examine sex influences in both our basic and clinical research to fully understand, and treat, the disorder.”¹¹⁰ For example, if the amygdala figures into depression or anxiety, then sex-based differences in that area of the brain may help understand the sex-biased difference in susceptibility to these brain disorders.

The research is developing; it will advance at different stages for different areas of the brain and likely will not prove definitive for a long time. The area of research and its results are still in disputation—the area is fraught with interpretive disagreements, and undoubtedly, explanations we accept today will change over time. However, the findings are real and mark an appropriate time to begin to consider the impacts these findings may have on other areas of society. Assuming that neuroscience documents verifiable and significant connections between sex-based brain differences and brain disorders and behavior, this Article raises the question of whether this research should influence the law. The remainder of this Article examines that question in the context of torts involving emotional injury and the reasonableness standard.

II. TORT LAW AND THE REASONABLE PERSON STANDARD

This Part examines the development of and theoretical basis for the reasonable person standard in tort law. Part III looks at some of the challenges to that standard that neuroscience studies may bring in the context of emotional and psychological harms.

To determine legal responsibility, a fundamental issue the law confronts is whether to apply a universal, neutral standard of conduct, like the reasonable person standard, or to individualize the standard in certain situations. In theory, tort law applies neutrally to both sexes, in the name of equality.¹¹¹ However, neuroscience studies in sex-based

110. Cahill, *Why Sex Matters*, *supra* note 10, at *6 (citing examples of differences in the disease pathology of Alzheimer’s, schizophrenia, and addiction between men and women); Gungor et al., *supra* note 8, at 3 (questioning whether trauma type, rather than pre-existing vulnerability, explains high rates of PTSD in women).

111. See MAYO MORAN, *RETHINKING THE REASONABLE PERSON: AN EGALITARIAN RECONSTRUCTION OF THE OBJECTIVE STANDARD* 6 (2003) (explaining that the reasonableness standard has “powerful links to equality”); *but see* Martha Chamallas, *Feminist Legal Theory and Tort Law*, in *RESEARCH HANDBOOK ON FEMINIST JURISPRUDENCE* 387 (2019) (arguing that gender inequalities are built into the “deep structures” of tort law through its failure to recognize

brain differences may challenge that principle. Building on aspects of feminist legal theory that recognize a blended approach to issues of equality in law, this Article concludes that we may one day apply that approach to the reasonable person standard, like the one courts apply to children in negligence cases and some courts have applied in hostile work environment cases, to acknowledge average sex-based brain differences that cause average differences in the processing and experiencing of emotional harm. Other sex-based brain differences may call for exceptions to the general rule as science advances, but research involving these areas will likely develop first. Applying a reasonable woman standard in this limited context would be one way to acknowledge measurable average differences in these experiences.

This Article proceeds with the assumption that science will document these differences sufficiently to meet legal evidentiary standards. It does not address the related issue of the admissibility of this research as evidence in court, although this is a significant hurdle. The key to using this evidence in legal theory and practice is determining the strength of the link between sex-based brain differences, behaviors, and cognitive functioning.¹¹² The current data suggest an association, but do not establish a causal link. Proof of a link sufficient to meet legal standards for causation will generally require a showing of reliability through replicated, rigorous studies that are peer-tested and generally accepted within the scientific community.¹¹³ Furthermore, the evidence likely will demonstrate group-based averages and increased likelihood of certain behavior and reactions and will not be indicative of individual traits or abilities. Although sometimes courts accept categorical evidence in certain settings,¹¹⁴ these limitations may raise questions of relevance.

claims of particular importance to women, such as claims for witnessing harm to their young children; third-party liability for sexual harassment, coercion, and violence; claims arising from reproductive injuries; and gender-biased calculations of damages) [hereinafter Chamallas, *Feminist Legal Theory and Tort Law*].

112. Courts are inconsistent in their approaches to admitting expert testimony on general group-level phenomena and applying it to specific cases. See David L. Faigman, John Monahan & Christopher Slobogin, *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417, 432–40 (2014) (examining courts' use of general expert testimony on eyewitness testimony, medical and psychological conditions, employment discrimination, and forensic identification). Courts exercise caution when it comes to proffering novel syndrome or theory evidence to be applied to the case at hand. *Id.* at 434 (citing examples of rape-trauma syndrome and battered woman syndrome).

113. See *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579, 580 (1993).

114. See *Graham v. Florida*, 560 U.S. 48, 68 (2010) (“[D]evelopments in psychology and brain science continue to show fundamental differences between juvenile and adult minds.”); *Roper v. Simmons*, 543 U.S. 551, 553 (2005) (stating that the Constitution bars capital punishment for

A. From Reasonable Man to Reasonable Person

The reasonable person standard is a measure to help courts and juries determine whether the defendant's behavior fell below a certain standard of care.¹¹⁵ Using the reasonableness standard to determine the requisite standard of care is ubiquitous across the legal landscape.¹¹⁶ The primary reason for the standard's ubiquity is promoting an egalitarian standard of responsibility and the rule of law.¹¹⁷ A secondary reason is its flexibility in application.¹¹⁸

In tort law, actors must conform to the general duty of due care,¹¹⁹ or be held accountable for their actions.¹²⁰ Tort law frequently applies the standard of the reasonable person—originally cast as the

juvenile offenders and recognizing categorical differences between juveniles and adults); *Atkins v. Virginia*, 536 U.S. 304, 304 (2002) (rejecting the death penalty for the intellectually disabled); Jozsef Meszaros, *Achieving Peace of Mind: The Benefits of Neurobiological Evidence for Battered Women Defendants*, 23 YALE J.L. & FEMINISM 117, 120 (2011) (arguing for the integration of neurobiological evidence into the defense of battered women); see also *Brown v. Ent. Merchs. Ass'n*, 564 U.S. 786, 852 (2011) (Breyer, J., dissenting) (citing “cutting-edge neuroscience” to support the argument that violent video games are linked to aggressive behavior).

115. Benjamin C. Zipursky, *Reasonableness In and Out of Negligence Law*, 163 U. PA. L. REV. 2131, 2134 (2015).

116. See Alan Calnan, Essay, *The Nature of Reasonableness*, 105 CORNELL L. REV. ONLINE 81, 81 (2020) (“[R]easonableness is one of the foundational concepts of American law. . . .”); Brandon L. Garrett, *Constitutional Reasonableness*, 102 MINN. L. REV. 61, 69–70 (describing use of the reasonableness concept across the legal landscape); Robert Unikel, “Reasonable” Doubts: *A Critique of the Reasonable Woman Standard in American Jurisprudence*, 87 NW. L. REV. 326, 327 (1992) (“[R]easonableness’ has gained a prominent position in almost every area of American law. A general survey reveals that the concept of ‘reasonableness’ is a standard of decisionmaking in administrative law, bailment law, constitutional law, contract law, criminal law, tort law, and the law of trusts.”); Frédéric G. Sourgens, *Reason and Reasonableness: The Necessary Diversity of the Common Law*, 67 ME. L. REV. 73, 74 (2014) (“Reasonableness is the keystone of the common law.”); Zipursky, *supra* note 115, at 2135–49 (listing examples of the use of reasonableness in law).

117. See MORAN, *supra* note 111, at 6 (stating that the reasonableness standard has “powerful links to equality”).

118. Garrett, *supra* note 116, at 62 (“[T]he flexibility and malleability of reasonableness standards [in constitutional law] accounts for their ubiquity and utility. . . .”); *id.* at 70 (quoting James Gibson, *Doctrinal Feedback and (Un)reasonable Care*, 94 VA. L. REV. 1641, 1643 (2008)) (“In tort law, the flexibility of the concept of reasonable care may be a weakness, but also its strength, giving courts the ability . . . ‘to arrive at the correct judgment in a fact-dependent context,’ even if the concept is ‘frustratingly imprecise’. . . .”); Sourgens, *supra* note 116, at 74 (“The edifice of the common law would collapse but for the balance struck between diverse and competing ends and interests by ‘reasonableness.’”).

119. See RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 3 (AM. LAW INST. 2010) (“A person acts negligently if the person does not exercise reasonable care under all the circumstances.”).

120. See DANIEL B. DOBBS, PAUL T. HAYDEN & ELLEN M. BUBLICK, HORNBOOK ON TORTS § 10.5 (2d ed. 2016).

reasonable man—to determine this duty,¹²¹ looking to the conduct that a hypothetical reasonable person would exercise in the position of the defendant to avoid harming others.¹²² If the individual’s behavior falls below that standard, the law finds that the actor breached the duty of care.

Scholars engage in significant debate about whether the reasonable person standard of due care in negligence law is descriptive, prescriptive, or both.¹²³ Although the modern majority view is that the foundation of the standard encompasses more than the idea of empirical average conduct, scholars still disagree about the normative basis of the standard.¹²⁴ This Article subscribes to the view that the reasonableness standard is largely normative but is informed by descriptive elements;¹²⁵ both aspects are relevant to the standard.¹²⁶

Regardless of the varying principles behind the standard and its male-oriented origins, the reasonableness standard generally seeks to promote objectivity¹²⁷ and judicial neutrality, both core legal values.¹²⁸

121. See Kerns, *supra* note 24, at 210–12 (2001) (describing the evolution of the reasonable man standard to the reasonable person standard).

122. Alan D. Miller & Ronen Perry, *The Reasonable Person*, 87 N.Y.U. L. REV. 323, 325 (2012).

123. Much ink has been spilled over whether the reasonable person standard is normative or descriptive or both. See *id.* at 323 (“[N]ormative definitions [of reasonableness] are categorically preferable to positive definitions, because the latter are logically unacceptable. . . .”); Kevin P. Tobia, *How People Judge What is Reasonable*, 70 ALA. L. REV. 293, 296 (2018) (explaining that the reasonableness standard “is best understood as a hybrid notion that is partly statistical and partly prescriptive”); Garrett, *supra* note 116, at 61; Sourgens, *supra* note 116, at 78. See MORAN, *supra* note 111, at 7 (describing tension between descriptive and normative components of the reasonable person standard).

124. These ideals include economic efficiency, fairness, community values, utilitarianism, and virtue. See Calnan, *supra* note 116, at 3 (arguing that reasonableness concept has physiological origins and susceptible to scientific investigation); Sourgens, *supra* note 116, at 78 (explaining that the common law “relies upon inconsistent pragmatic, formalist, and utilitarian reasonableness paradigms”); Zipursky, *supra* note 115, at 2142 (proposing a theory of reasonableness as one of mutuality); Heidi Li Feldman, *Prudence, Benevolence, and Negligence: Virtue Ethics and Tort Law*, 74 CHI.-KENT L. REV. 1431, 1432 (2000) (explaining tort doctrine from a virtue ethics viewpoint).

125. See *The T. J. Hooper v. N. Barge Corp.*, 60 F.2d 737, 740 (2d Cir. 1932).

126. See Zipursky, *supra* note 115, at 2149–50; Tobia, *supra* note 123, at 342 (stating that the hybrid view seeks to avoid some of the absurdities of either a strictly statistical standard—raising problems of average accidents and reasonable racism—or a strictly prescriptive view—protecting consumers only in situations in which they ought to be misled); MORAN, *supra* note 111, at 2 (“The way that the reasonable person seamlessly intertwines the normative and descriptive may be one source of his appeal . . .”).

127. See DOBBS ET AL., *supra* note 120, § 9.7 (stating that the reasonable person approach “reflects the law’s strong commitment to an objective standard of behavior”); Unikel, *supra* note 116, at 330.

128. Unikel, *supra* note 116, at 326.

The law depends on neutrality to avoid favoring one individual or group over another for illegitimate reasons and draws from the fundamental goal of equal protection of the law.¹²⁹ The objective standard signals to the community what constitutes acceptable behavior: to use a subjective standard “would leave so vague a line as to afford no rule at all, the degree of judgment belonging to each individual being infinitely various”¹³⁰ Courts therefore reject a “best efforts” defense and do not allow individuals to set their own standards of conduct.¹³¹

Thus, the law expects individuals to act with normal intelligence, perception, and memory, given the situation facing the actor.¹³² In particular, tort law takes into account very few individual characteristics, even including mental capacity or old age, in judging behavior.¹³³ The law relies on rough averages of behavior reflected in custom or industry practice to help inform what constitutes reasonable behavior.¹³⁴ In the end, though, we leave it to individual juries, not strict guidelines, to determine what behavior is reasonable in given circumstances.¹³⁵

In some limited settings, tort law takes into account the perspective and capabilities of people like the actor.¹³⁶ This allows the

129. See MORAN, *supra* note 111, at 10 (drawing on John Rawls’s discussion of the rule of law which “clarifies that under a system of the rule of law, judicial decision-making must at a minimum exhibit a certain kind of equality across cases”).

130. Vaughan v. Menlove (1837) 132 Eng. Rep. 490, 493 (C.P.).

131. See *id.*

132. DOBBS ET AL., *supra* note 120, §§ 10.8, 10.12.

133. *Id.* § 10.8; Kristin Harlow, *Applying the Reasonable Person Standard to Psychosis: How Tort Law Unfairly Burdens Adults with Mental Illness*, 68 OHIO ST. L.J. 1733, 1738, 1743 (2007). As Justice Holmes stated, the standards applied to the reasonable person are “standards of general application. The law takes no account of the infinite varieties of temperament, intellect, and education which make the internal character of a given act so different in different men.” OLIVER WENDELL HOLMES, *THE COMMON LAW* 108 (1881). Thus, an external, objective standard of care avoids arbitrary interpretation and unfairness to other members of the community.

134. The reasonableness standard is defended by its “unifying power, even if, in practice, what is reasonable is highly fact-dependent and will require fact-sensitive and industry-sensitive judgments.” Garrett, *supra* note 116, at 108 (citing David Zaring, *Rule by Reasonableness*, 63 ADMIN. L. REV. 525, 538–39 (2011)).

135. See Mark P. Gergen, *The Jury’s Role in Deciding Normative Issues in the American Common Law*, 68 FORDHAM L. REV. 407, 424–25 (1999); see, e.g., 7A MICH. CIV. PRAC. FORMS § 127:30 (2020) (“The law does not say what a reasonably careful person would do or would not do under the circumstances. That is for you to decide.”); cf. MORAN, *supra* note 111, at 305–06 (discussing the difficulties of determining what behavior is reasonable).

136. Tort law sometimes takes into account objectively verifiable physical characteristics in certain groups, such as the disabled, in judging behavior. DOBBS ET AL., *supra* note 120, § 10.9; see RESTATEMENT (SECOND) OF TORTS § 283A (AM. LAW INST. 1965) (stating that for children,

applicable standard to be closer to the attributes of the individual being judged.¹³⁷ The classic example is children.¹³⁸ The common law measures the behavior of a child against the standard of an ordinary child of like age, experience, and intelligence when engaged in children's activities.¹³⁹ This blended standard allows greater consideration of subjective factors than the traditional standard permits, including capacity. Tort law offers various justifications for this special treatment.¹⁴⁰ At bottom, the exception reflects a societal view that we should not hold children to the same standard as reasonable adults when they are engaging in children's activities, but rather to the behavior of someone more like themselves.¹⁴¹ This blended approach takes into account an attribute that is descriptive, but compares it against a normative standard.

The problem of individualization—when to take personal characteristics into account in judging behavior—is a difficult one.¹⁴²

the reasonable person standard can take into account the perspective of those of “like age, intelligence, and experience under like circumstances”). Higher skill is another exception. Tort law measures professional standards by using external measures of skill of the profession. The prototype is medical malpractice, in which we measure a doctor's treatment of a patient against the treatment of a reasonable doctor in a similar medical field to determine whether the treatment fell below the medical standard of care. DOBBS ET AL., *supra* note 120, § 21.6.

137. See MORAN, *supra* note 111, at 279–80 (describing how further contextualization and particularization of a reasonableness standard will result in a standard that “more closely approximate[s] the individual being judged”).

138. See RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 10 (AM. LAW INST. 2010) (“A child's conduct is negligent if it does not conform to that of a reasonably careful person of the same age, intelligence and experience . . .”); DOBBS ET AL., *supra* note 120, § 10.14 (stating that children are required to conform to the standard of a child of similar age and abilities); MORAN, *supra* note 111, at 6 (finding that when judging children, courts demand that “the characteristics of the legal person closely mirror those of the actual person whose behaviour is being judged”).

139. RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 10.

140. Justifications include the belief that children develop cognitive and physical abilities at different rates; children should develop at their own pace; the law should reflect the normative view of what children ought to do; and perhaps the law assumes that others in the community will take care to avoid the consequences of children's activities. See Betsy J. Grey, *Implications of Neuroscience Advances in Tort Law: A General Overview*, 12 IND. HEALTH L. REV. 671, 682 (2015); MORAN, *supra* note 111, at 9 (suggesting that the special standard for children refers to how normal childhood is, and may reflect our view of their importance to society as opposed to other minority groups); Harlow, *supra* note 133, at 1740–42 (describing the development of the negligence standard for children); RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 10 cmt. b.

141. Cf. *Roper v. Simmons*, 543 U.S. 551, 569 (2005) (taking age into account for application of the death penalty).

142. See Tobia, *supra* note 123, at 346–47 (finding that the problem of individualization “is important and difficult, and . . . is largely separate from the statistical, prescriptive, and hybrid debate”). See generally David E. Seidelson, *Reasonable Expectations and Subjective Standards in*

Although characteristics such as age, gender, mental illness, and culture have challenged application of the universal standard and have occasionally created exceptions,¹⁴³ recognizing differences can create as many problems as it solves. Tort law cannot take into account every individual characteristic—driven by either objective capacity differences or normative values—in determining reasonableness because it would leave us with practically no general standard.¹⁴⁴ The concern is that individualization will allow discriminatory concepts to bleed into the objective reasonableness standard, implying some kind of differences in race or sex that we consider illegitimate considerations.¹⁴⁵ Fundamentally, individualization challenges the goal of equality.¹⁴⁶ The critical question is, therefore, when—if ever—tort law should make an exception.

The origins of the reasonableness standard in tort law reflect this struggle. Until relatively recently, reasonable conduct referred to the “reasonable man” as the reference point,¹⁴⁷ implying male attributes to the reasonableness standard.¹⁴⁸ Courts gradually removed references to sex in an attempt to eliminate a masculine orientation of the standard.¹⁴⁹

Negligence Law: The Minor, the Mentally Impaired, and the Mentally Incompetent, 50 GEO. WASH. L. REV. 17, 20–26 (1981) (discussing the reasonableness standard as applied to minors).

143. See Tobia, *supra* note 123, at 346–47.

144. See *id.* at 348 (“[E]ven if the statistical view [of the reasonable person standard] only acknowledges features with a statistically significant impact . . . , we will still have far too many individualized reasonableness standards.”); MORAN, *supra* note 111, at 3 (“[W]ithout a clear sense of which qualities of the reasonable person matter normatively and which do not, the standard threatens to disappear into a description of the actual person.”); Tobia, *supra* note 118, at 349 (“From a prescriptivist perspective, individualization—like reasonableness—is not about statistical patterns of behavior; instead, it is about normatively correct behaviors.”).

145. See MORAN, *supra* note 111, at 307 (“[P]ersonification makes it so difficult to articulate a standard that is appropriately sensitive to equality without implying some kind of essential moral and epistemological differences among genders, races, and the like.”).

146. *Id.* at 274.

147. See Margo Schlanger, *Injured Women Before Common Law Courts, 1860 – 1930*, 21 HARV. WOMEN’S L.J. 79, 80–82 (1998). A quote often cited as an example is an English court’s description that the “reasonable man” is “the man who takes the magazines at home, and in the evening pushes the lawn mower in his shirt sleeves.” *Hall v. Brooklands Auto-Racing Club*, [1932] 1 K.B. 205, 224.

148. Leslie Bender, *A Lawyer’s Primer on Feminist Theory and Tort*, 38 J. LEGAL EDUC. 3, 22 (1988); DEBORAH L. RHODE, *JUSTICE AND GENDER: SEX DISCRIMINATION AND THE LAW* 20 (1991); see also Garrett, *supra* note 116, at 63 (“Commentators have long critiqued reasonable man and reasonable person standards in common law fields for assuming perspectives that, in fact, bring in non-objective assumptions about conduct.”).

149. See Miller & Perry, *supra* note 122, at 362 (noting how feminist theory, after the change to “reasonable person,” argued that the standard was still given a masculine orientation). Some authors have argued that the reasonable person standard still has a male bias. See Bender, *supra*

Many scholars argue that, despite the change, traditional male values continue to permeate negligence law.¹⁵⁰ As an early critic, Professor Leslie Bender argued that the change from the reasonable man to the reasonable person standard was mostly cosmetic and disparate in its application.¹⁵¹ A strong theme in feminist criticism is that the law generally has not sufficiently recognized women's experiences.¹⁵² Thus, the facially neutral reasonable person standard is not neutral as applied.¹⁵³ The debate continues.¹⁵⁴

A notable breakthrough in applying sex-based standards to a reasonable person test has occurred in the area of hostile work

note 148, at 22; *see generally* Caroline Forell, *Essentialism, Empathy, and the Reasonable Woman*, 1994 U. ILL. L. REV. 769 (arguing that the reasonableness standard is still male-oriented).

150. *See* Naomi R. Cahn, *The Looseness of Legal Language: The Reasonable Woman Standard in Theory and in Practice*, 77 CORNELL L. REV. 1398, 1404 (1992) ("The male bias inherent in a standard that explicitly excludes consideration of women as reasonable actors is obvious."); Nancy S. Ehrenreich, *Pluralist Myths and Powerless Men: The Ideology of Reasonableness in Sexual Harassment Law*, 99 YALE L.J. 1177, 1178 (1990) ("[D]efinitions of reasonableness often reflect the values and assumptions of a narrow elite . . ."); MORAN, *supra* note 111, at 199 ("The suspiciously masculine nature of the reasonable person is one of the most long-standing topics of discussion in the general literature on feminism and the law.").

151. *See* Bender, *supra* note 148, at 22. As Professor Leslie Bender explained, "[o]ur legal system . . . is a system that resolves problems through male inquiries formulated from distanced, abstract, and acontextual vantage points, while feminism emphasizes relationships, context, and factual particulars for resolving human problems." *Id.* at 10–11; *see also* RHODE, *supra* note 148, at 20.

152. *See* Patricia A. Cain, *Feminist Jurisprudence: Grounding Theories*, 4 BERKELEY WOMEN'S L.J. 191, 191 (1989) ("What makes any theory particularly feminist is that it is derived from female experience, from a point of view contrary to the dominant male perception of reality."); Chamallas, *supra* note 111, at 387 ("The unstated norms in tort doctrines still tend to be based on men's life experiences.").

153. Bender, *supra* note 148, at 23 ("When [the reasonable man standard] was converted to 'reasonable person,' it still meant 'person who is reasonable by my standards' almost exclusively from the perspective of a male judge, lawyer, or law professor . . ."). Some theorists challenged Bender's premise that the reasonableness standard is always based on a "male perspective." *See* Schlanger, *supra* note 147, at 85. After examining case studies of nineteenth and early twentieth century cases involving injuries to women, Professor Margo Schlanger argued that these cases demonstrate that, "[f]ar from naively erasing gender by subsuming women into the male category of 'reasonable men' or a purportedly neutral, but no less male category of 'reasonable persons,' courts actually treated gender as an important factor in assessing appropriate standards of care." *Id.* at 84–85. She argued that these cases do not "support a charge of invariable refusal to take account of women's experience, or of consistent deprecation of women's capabilities." *Id.* at 85.

154. As Professor Brandon Garrett observed: "Common criticisms remain that reasonableness tends to be interpreted to reflect standards of care that do not reflect diverse viewpoints, but rather those of reductionist, or majority, or male viewpoints; a non-emotional perspective; or a privileged judicial perspective." Garrett, *supra* note 116, at 72; *see* MORAN, *supra* note 111, at 274 ("The worry for equality seekers is that in the very kinds of cases that most concern them, the presence of widespread 'unreasonable'—non-egalitarian—beliefs will hold out an alternative reading of reasonableness that enables discriminatory beliefs to feed into the 'objective' standard.").

environment litigation.¹⁵⁵ The Ninth Circuit was the first circuit court to adopt the reasonable woman standard in the Title VII context in *Ellison v. Brady*.¹⁵⁶ The court justified its use of the standard because a “sex-blind reasonable person standard tends to be male-biased and tends to systematically ignore the experiences of women.”¹⁵⁷ In a later case involving sexual harassment, the Ninth Circuit applied a standard based on a reasonable person in the same protected classification as the plaintiff, such as a reasonable woman.¹⁵⁸ In *Rabidue v. Osceola Refining Co.*,¹⁵⁹ a Sixth Circuit case that arose from an allegedly hostile work environment, the dissent argued in favor of applying a reasonable woman standard in that context.¹⁶⁰ Other circuits have applied the perspective of women in the workplace when judging hostile work environment claims.¹⁶¹

These courts were more concerned with cultural differences between men and women, whereas this Article focuses on empirical biological differences between men and women. Similar objections are raised, however, to recognizing sex-based differences in a legal context. Some scholars have argued that use of the reasonable woman standard

155. E.g., *Ellison v. Brady*, 924 F.2d 872, 879 (9th Cir. 1991); *Rabidue v. Osceola Refin. Co.*, 805 F.2d 611, 626 (6th Cir. 1986); Jeremy A. Blumenthal, *The Reasonable Woman Standard: A Meta-Analytic Review of Gender Differences in Perceptions of Sexual Harassment*, 22 L. & HUMAN BEHAV. 33, 34–35 (1998); Cahn, *supra* note 150, at 1409; Barbara A. Gutek & Maureen O’Connor, *The Empirical Basis for the Reasonable Woman Standard*, 51 J. SOC. ISSUES 151, 152 (1995); Elizabeth L. Shoenfelt et al., *Reasonable Person Versus Reasonable Woman: Does It Matter?*, 10 AM. U. J. GENDER, SOC. POL’Y, & L. 633, 637 (2002). See MORAN, *supra* note 111, at 276–81 (discussing the development, use, and debate around the “reasonable woman” standard).

156. *Ellison v. Brady*, 924 F.2d 872 (9th Cir. 1991).

157. *Id.* at 879.

158. *EEOC v. Nat’l Educ. Ass’n*, 422 F.3d 840, 845–46 (9th Cir. 2005).

159. *Rabidue v. Osceola Refin. Co.*, 805 F.2d 611 (6th Cir. 1986).

160. *Id.* at 626–27 (Keith, J., dissenting). According to the Supreme Court, a hostile work environment is one “that a reasonable person would find hostile or abusive.” *Harris v. Forklift Sys., Inc.*, 510 U.S. 17, 21 (1993). In a later case, the Court explained that this “reasonable person” must be viewed “in the plaintiff’s position considering ‘all the circumstances.’” *Oncale v. Sundowner Offshore Servs. Inc.*, 523 U.S. 75, 81 (1998). In determining the view of the reasonable person, the factfinder should undergo “careful consideration of the social context in which particular behavior occurs and is experienced by its target.” *Id.*; see MORAN *supra* note 117, at 275 (“[C]oncerns about how the reasonable person standard has incorporated ‘ordinary’ male sexual harassment have caused many feminists and even some courts to abandon that standard in favour of a standard premised [sic] on the ‘reasonable woman.’”).

161. See, e.g., *Fuller v. Idaho Dep’t of Corr.*, 865 F.3d 1154, 1162 (9th Cir. 2017); *Clayton v. City of Atl. City*, 538 F. App’x 124, 128 (3d Cir. 2013); *Gray v. Genlyte Grp., Inc.*, 289 F.3d 128, 133 (1st Cir. 2002); *Woods v. Delta Beverage Grp., Inc.*, 274 F.3d 295, 301 (5th Cir. 2001). The Fifth, Sixth, Eighth, and Eleventh Circuits have rejected application of a reasonable woman standard, however. See Alyssa Agostino, *The Reasonable Woman Standard’s Creation of the Reasonable Man Standard: The Ethical and Practical Implications of the Two Standards and Why They Should Be Abandoned*, 41 J. LEGAL PRO. 339, 339 (2017).

in the hostile work environment context would reinforce stereotypes about women as victims,¹⁶² or as being more moral than men.¹⁶³ These critics question whether women who are situated differently—in class or race for example—could even possess the homogeneity suggested by the reasonable woman standard.¹⁶⁴

To contend with some of these issues in the context of sex-based brain differences, the next section briefly describes the main approaches in feminist jurisprudence to creating standards and maintaining equality in law.

B. Feminist Considerations on the Adoption of Differentiating Standards Based on Sex

Scholars of feminist jurisprudence have grappled with approaches to creating standards and promoting equality in law,¹⁶⁵ including the use of the reasonable woman standard.¹⁶⁶ A central question for many feminist scholars is whether women's equality is best promoted by emphasizing sameness and adopting universal legal standards or by recognizing and embracing differences between the sexes.¹⁶⁷ Professor Martha Minow labeled this the “dilemma of difference” and explained: “The stigma of difference may be recreated both by ignoring and by focusing on it The problems of inequality can be exacerbated both by treating members of minority groups the same as members of the majority and by treating the two groups differently.”¹⁶⁸ Three main views of feminist theory as applied to the reasonable person standard highlight this dilemma of difference.

162. Jolynn Childers, *Is There a Place for a Reasonable Woman in the Law? A Discussion of Recent Developments in Hostile Environment Sexual Harassment*, 42 DUKE L.J. 854, 896 (1993).

163. Cahn, *supra* note 150, at 1415.

164. See Childers, *supra* note 162, at 889–90 (noting that feminist critics argued that any reasonable woman standard will reflect a “white, upper-middle-class bias”). Others suggest that the reasonable woman standard would allow application of a standard that reflects different social circumstances, by further contextualizing the standard. See Cahn, *supra* note 150, at 1417–20, 1435.

165. This brief description vastly oversimplifies a diverse and rich field of thinking and does not attempt to capture all the various strains of thought in this area. For an excellent overview of different feminist jurisprudence theories and their varying threads, see generally CYNTHIA GRANT BOWMAN, LAURA A. ROSENBURY, DEBORAH TUERKHEIMER & KIMBERLY A. YURACKO, *FEMINIST JURISPRUDENCE: CASES AND MATERIALS* (5th ed. 2018), and MARTHA MINOW, *MAKING ALL THE DIFFERENCE: INCLUSION, EXCLUSION, AND AMERICAN LAW* (1990).

166. MORAN, *supra* note 111, at 278.

167. NANCY LEVIT & ROBERT R.M. VERCHICK, *FEMINIST LEGAL THEORY: A PRIMER* 18 (2d ed. 2016).

168. MINOW, *supra* note 165, at 20.

One view, liberal feminism, emphasizes equal treatment under the law and draws from formal equality theory, which traces back to the liberal democratic theory of John Stuart Mill.¹⁶⁹ Under this view, inequality means treating similarly situated women and men differently. Thus, laws using sex-based classifications, often “rationalized as reflecting ‘natural’ differences between the sexes,” are frequently based on stereotypes, which defeat the goal of giving individuals an equal opportunity to compete in the public spheres.¹⁷⁰ Liberal feminism would resist any sex-specific classifications.¹⁷¹ This view would argue in favor of a single, non-sex-specific, and facially-neutral reasonable person standard in tort law.

A second view emphasizes the biological and socially constructed differences between men as a group and women as a group, including the ways in which they view the world.¹⁷² “Difference” theorists examine facially neutral laws that affect women and men differently, and examine whether those laws should take sex-based differences into account.¹⁷³ Difference theorists would argue in favor of reexamining the reasonable person standard in light of its actual—unequal—application.

Finally, some theorists promote a “blended” approach. As Professor Ann Bartow explained, these theorists “believ[e] that for women to achieve true and meaningful equality, sometimes the law needs to treat women and men as equals, and other times it needs to acknowledge and control for differences related to gender.”¹⁷⁴ This

169. See West, *supra* note 1, at 991.

170. Ruth Bader Ginsburg & Barbara Flagg, *Some Reflections on the Feminist Legal Thought of the 1970s*, 1989 U. CHI. LEGAL F. 9, 11 (1989); see *id.* at 14–15, 17. We often refer to this as leveling the playing field, to take away public-sphere obstacles to equal competition.

171. As Professors Alan Miller and Ronen Perry explained,

distinguishing between reasonable women and reasonable men impairs the neutrality and objectivity of the concept of reasonableness, which is intended to set equal boundaries on all persons’ conduct and to afford equal protection to all persons’ interests. A separate standard for women reinforces the anachronistic notion that men and women should not be treated equally.

Miller & Perry, *supra* note 122, at 363.

172. See Robin L. West, *The Difference in Women’s Hedonic Lives: A Phenomenological Critique of Feminist Legal Theory*, 15 WIS. WOMEN’S L.J. 149, 149–53 (2000).

173. Two branches of this line of thinking—cultural feminism, which demands reevaluation of traditionally feminine activities and traits, and radical feminism, which condemns sexual exploitation—reflect this focus. See MARTHA CHAMALLAS & JENNIFER B. WRIGGINS, *THE MEASURE OF INJURY: RACE, GENDER, AND TORT LAW* 7 (2010).

174. Ann Bartow, *Legal Theory Lexicon 061: Feminist Legal Theory*, LEGAL THEORY LEXICON (Nov. 19, 2006), http://solum.typepad.com/legal_theory_lexicon/2006/11/legal_theory_le.html [<https://perma.cc/7342-HJNL>].

approach would argue in favor of adopting a reasonable woman standard in some contexts.¹⁷⁵

Some theorists criticize the view of women as a monolithic group under any of these theories since experiences may be shaped by differences other than sex, such as race, class, sexual orientation, and ethnicity.¹⁷⁶ Under the intersectionalist view, the search for a reasonable woman's viewpoint could prove futile since "the values of the dominant members of the group—namely, white, affluent, heterosexual women—would be construed as representative of the whole."¹⁷⁷

Neuroscience studies should inform this debate and force the law to reconsider the reasonableness standard in a new light. The emerging science may allow us to take better measure of people's experiences based on physiology. It would allow lawmakers and judges to confront the problem of whether to apply a blended approach to tort law, at

175. As Professor Naomi Cahn has argued, egalitarian considerations can be realized in a standard that "subjectively considers the pressure on an individual who is a member of a community with explicit standards for her behavior." Cahn, *supra* note 150, at 1436. Miller and Perry reconstitute these feminist approaches as applied to the reasonableness standards into three formulations: "weak," "intermediate," and "strong." Miller & Perry, *supra* note 122, at 362–63 (2012). The weak formulation would apply some gender aspects to the objective standard. *Id.* at 362. The intermediate standard—an inclusive one—would include all feminist perspectives, experiences, and capabilities to create a single, neutral reasonable person standard. *Id.* at 364 (citing Lucinda M. Finley, *A Break in the Silence: Including Women's Issues in a Torts Course*, 1 YALE J.L. & FEMINISM 41, 63–64 (1989)). The strong formulation would subject all persons to a feminine standard of care, such as a duty to rescue regardless of a prior relationship. *Id.* (citing CAROL GILLIGAN, IN A DIFFERENT VOICE: PSYCHOLOGICAL THEORY AND WOMEN'S DEVELOPMENT 19 (1982)).

176. See Kimberle Crenshaw, *Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics*, 1989 U. CHI. LEGAL F. 139, 139–40 (1989); see also Kimberle Crenshaw, *Mapping the Margins: Intersectionality, Identity Politics, and Violence Against Women of Color*, 43 STAN. L. REV. 1241, 1245–51 (1991) (showing that women of color experience more violent harm due to intersectional effects). The problem of intersectionality—that experiences are shaped by factors other than sex, such as class, ethnicity, age, race, and disability—is the focus of much of the "third wave" of feminism, starting in the late 1980s. West, *supra* note 1, at 980 n.12. The intersectionalist view demands that feminists recognize the different societal hierarchies of women since some women are more privileged than others due to these hierarchies. MARTHA CHAMALLAS, INTRODUCTION TO FEMINIST LEGAL THEORY 6–7 (3d ed. 2013) [hereinafter CHAMALLAS, INTRODUCTION TO FEMINIST LEGAL THEORY]. As Professor Martha Chamallas stated, "[t]he intersectional move is designed to curb the temptation to speak in universal terms, a habit feminists detest in male-oriented scholarship and language." *Id.* at 7. This Article does not seek to marginalize these legitimate considerations nor their influences on behavior. It merely seeks to focus on neuroscientific scholarship available on sex-based brain differences.

177. *Id.* at 319. Relatedly, a major criticism of the reasonable woman standard is its potential failure to recognize that not everyone conforms to the gender stereotype. Miller & Perry, *supra* note 122, at 363; see MORAN, *supra* note 111, at 278–79.

times taking into account empirical sex differences. This could mean incorporating a reasonable woman standard in certain limited settings, such as those freestanding torts that involve emotional harm.

III. NEUROBIOLOGY CHALLENGES TO THE REASONABLE PERSON STANDARD

As science gets better at measuring average sex-based brain differences and tracing their impact on behavior, particularly those that affect processing stress, trauma, and storing emotional memory, these advances may force the law to consider whether quantifiable differences should inform tort law in determining duty and breach in emotional harm claims.¹⁷⁸

More specifically, science may force the law to confront the issue of whether to move from the traditional liberal feminist view of the reasonable person standard to one that reflects the legal feminist theory “blended” approach. In other words, this would mean changing the reasonable person standard from one that prioritizes equality in law over the recognition of sex-based differences to a standard that considers average sex-based differences in limited settings, such as those involving average physiological experiences of extreme stress and trauma. The experience of stress and emotional injury is inherently individualistic, so these averages will not predict individual reactions to emotional harm. Would taking these average differences into account create an objective, more accurate, and biologically-informed standard of care, or would this simply return us to the anachronistic view that women and men are not equals and should be held to different standards?

This Part examines this question in the context of two freestanding emotional harm claims in tort law, NIED and IIED claims, particularly in a hostile work environment. Although the first claim judges negligent behavior and the second judges intentional behavior, they apply similar reasonableness tests to evaluate the harm suffered and limit the availability of the claims. In addition, the IIED claim uses a reasonableness standard to evaluate the outrageousness of the

178. This is not to suggest that scientific labels are not value-laden. In fact, when science labels something as normal or pathological, it is to some extent importing notions of value. See MORAN, *supra* note 111, at 145 (“[T]he idea of normal is problematic even in its scientific application.”). Feminist critics point out that seemingly neutral categories in science can distort our understanding of the natural world. *Id.* at 146 (citing literature on science and gender). The concept of normal has been used to justify unequal treatment of women and the developmentally disabled, along with the exclusion from full privileges of citizenship. *Id.* at 146–47.

intentional misconduct, another limiting test tied to the reasonableness of the reaction. Given the scientific studies discussed above that suggest that men and women experience and process emotional injury in different ways, they offer good exemplars for examining how science could challenge the reasonableness standards applied in those contexts.

A. *The Reasonable Reaction and Outrageousness Test in Emotional Harm Claims*

Both NIED and IIED claims curtail emotional harm claims by evaluating the reasonableness of the reaction to the tortious behavior inflicted on the plaintiff, a limitation that does not arise in traditional torts. In addition, the IIED claim applies a similar test to determine the outrageousness of the behavior at issue. After describing the use of these tests under both NIED and IIED claims, this Section discusses how neuroscience studies could influence the application of these tests.

Two main types of claims comprise the NIED tort: negligent conduct that (1) directly imposes emotional harm on the plaintiff (“direct harm cases”); or (2) imposes emotional harm resulting from witnessing bodily harm to a third person (“bystander cases”).¹⁷⁹ The law traditionally treats both types of NIED claims more restrictively than the classic negligence case, with the explanations that it is more difficult to evaluate emotional injury than physical and property harm; physical and property damage deserve priority; and a more liberal standard may lead to disproportionate liability.¹⁸⁰

A significant limiting test applied to direct harm cases¹⁸¹ evaluates the harm suffered by the plaintiff compared to a reasonable person’s reaction to the same harm.¹⁸² Thus, courts often require that the inflicted harm be such that it would cause severe emotional distress in

179. DOBBS ET AL., *supra* note 120, § 29.9.

180. See Chamallas, *Feminist Legal Theory and Tort Law*, *supra* note 111, at 400, 402. I have argued elsewhere that neuroscience advances may eventually give us ways to validate emotional stress responses and lead us to strike down some of these extra barriers. See Betsy J. Grey, *The Future of Emotional Harm*, 83 FORDHAM L. REV. 2605, 2647 (2015).

181. Although courts do not typically apply the same reasonable reaction test to bystander NIED claims, they achieve the same effect through other limitations. See, e.g., *Portee v. Jaffee*, 417 A.2d 521, 527 (N.J. 1980) (limiting the availability of bystander claims to individuals who witnessed the contemporaneous serious injury or death of a close family member due to a defendant’s negligence). The assumption is that reasonable people would suffer severe emotional distress in that context. *Id.* (“[T]he scope of recovery must be circumscribed to negligent conduct which strikes at the plaintiff’s basic emotional security.”).

182. DOBBS ET AL., *supra* note 120, § 29.9.

an ordinarily sensitive person.¹⁸³ If a reasonable person would be able to withstand the behavior without suffering severe emotional stress, then the law does not recognize a tort, even if the plaintiff actually suffered emotional distress.¹⁸⁴ This limitation to duty and breach is in contrast to the usual damages rule in torts of the “thin-skulled” plaintiff, under which the defendant is responsible for the injury caused even if it is unusually extensive.¹⁸⁵

The other traditional freestanding emotional harm claim, IIED, or the tort of outrage,¹⁸⁶ also incorporates a reasonableness standard. The standard surfaces in two elements: (1) the distress suffered must be severe;¹⁸⁷ and (2) the behavior must be outrageous.¹⁸⁸

A demonstration of severe distress typically applies a reasonableness standard similar to that applied in the NIED setting. “The law intervenes only where the distress inflicted is so severe that no reasonable [person] could be expected to endure it.”¹⁸⁹ Courts interpret this test to mean a person of “ordinary sensitivities.”¹⁹⁰

183. See *Ragin v. Harry Macklowe Real Estate Co.*, 6 F.3d 898, 908 (2d Cir. 1993); *DiMare v. RealtyTrac, Inc.*, 714 F. Supp. 2d 199, 211 (D. Mass. 2010) (“To recover for negligent infliction of emotional distress, plaintiff must show that a reasonable person would have suffered the same level of emotional distress under similar circumstances.”); *Gammon v. Osteopathic Hosp. of Me., Inc.*, 534 A.2d 1282, 1285 (Me. 1987); *Williamson v. Waldman*, 696 A.2d 14, 22 (N.J. 1997).

184. Once this test is met, the Third Restatement provides that the plaintiff may then recover for all resulting harm, even if it is unforeseeable, using the traditional “eggshell” plaintiff test of damages. See RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 31 (AM. LAW INST. 2012). The Restatement also provides that the eggshell plaintiff rule applies in cases where the defendant knows about the victim’s unusual vulnerability. *Id.*

185. See *DOBBS ET AL.*, *supra* note 120, § 15.11. This rule falls under the general law of proximate cause, which draws a distinction between unexpected type and unexpected extent of harm. *Id.*

186. See *Hansen v. SkyWest Airlines*, 844 F.3d 914, 926–27 (10th Cir. 2016) (describing the use of IIED claims for sexual harassment in the workplace).

187. RESTATEMENT (SECOND) OF TORTS § 46 cmt. j (AM. LAW INST. 1965); RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 46 cmt. j. IIED claims also require that the defendant intended to inflict severe emotional distress or acted with reckless disregard of the likelihood of plaintiff suffering such harm. RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 46 cmt. h.

188. RESTATEMENT (SECOND) OF TORTS § 46 cmt. d; RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 46, cmt. d.

189. RESTATEMENT (SECOND) OF TORTS § 46 cmt. j.

190. See RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 46 cmt. j (reiterating the reasonable person standard that “the law intervenes only when the plaintiff’s emotional harm is severe and when a person of ordinary sensitivities in the same circumstances would suffer severe harm”); see also Sean O’Brien, *The Highly Sensitive Person’s Redress for Intentional Infliction of Emotional Distress: Utilizing Experts in the Courtroom*, 49 U. MEM. L. REV. 533, 549 (2019) (stating that “the law remains steadfast to the standard of a reasonable person of ordinary sensitivities” in the IIED claim).

One of the earliest forms of a claim for hostile work environment arose under the IIED claim.¹⁹¹ When used in this context, the tort seeks to deter and compensate for conduct that causes emotional harm for sexual harassment in the workplace.¹⁹²

Courts have struggled with how to evaluate the severity of the victim's reaction under an IIED claim in this context. In *Kanzler v. Renner*,¹⁹³ for example, the court compared the plaintiff's severe distress from workplace harassment to that of a "reasonable man," and found that her evidence of PTSD, anxiety, and depression was sufficient to create a jury question on the severity of her emotional distress.¹⁹⁴ Courts do not appear to have contextualized this further; research did not reveal any specific adoption of a reasonable woman standard to the reasonable reaction test in the IIED workplace harassment context.¹⁹⁵

The flip side of the reasonable reaction test is found in the IIED outrageousness test. With this test, the law attempts to determine which behaviors should be considered culpable for resulting injury. The Restatement test for outrageousness asks whether an average

191. See *Kanzler v. Renner*, 937 P.2d 1337, 1340–42, 1342 n.3 (Wyo. 1997) (discussing the interplay between Title VII and IIED claims in the area of sexual harassment); CATHARINE A. MACKINNON, *SEXUAL HARASSMENT OF WORKING WOMEN: A CASE OF SEX DISCRIMINATION* 164–74 (1979) (describing early tort actions for sexual harassment, including claims for battery, assault, and IIED); cf. Martha Chamallas, *Discrimination and Outrage: The Migration from Civil Rights to Tort Law*, 48 WM. & MARY L. REV. 2115, 2127–35 (2007) (describing judicial reluctance to use IIED to address hostile environment sexual harassment). While this article addresses the common law claim, workplace sexual harassment can also be brought under the federal statute that addresses sex discrimination, known as "Title VII." Title VII of the Civil Rights Act of 1964, 42 U.S.C. § 2000e-2(a) (2018). The Guidelines for the Equal Employment Opportunity Commission state that workplace discrimination based on sex is prohibited. 29 C.F.R. § 1604.11(a) (2017). Much ink has been spilled about this cause of action. The Supreme Court has found two main types of sexual harassment under Title VII: (1) quid pro quo, and (2) hostile work environment, in which the sexual conduct is so offensive and intimidating that it affects the employee's ability to perform a job. See *Meritor Sav. Bank, FSB v. Vinson*, 477 U.S. 57, 65 (1986). The claimant must prove that the environment was sufficiently hostile from both an objective and subjective perspective. See *Harris v. Forklift Sys., Inc.*, 510 U.S. 17, 21–22 (1993). An objectively hostile work environment is one that "a reasonable person would find hostile or abusive." *Id.* at 21. The Supreme Court has inched toward recognizing a more subjective, gendered perspective, stating that this "reasonable person" should be viewed from the perspective of the reasonable person in the plaintiff's position. *Oncale v. Sundowner Offshore Servs., Inc.*, 523 U.S. 75, 81 (1998) (citing *Harris*, 510 U.S. at 23); see also *Burlington N. & Santa Fe Ry. Co. v. White*, 548 U.S. 53, 69–70 (2006) (suggesting that the consideration of how a person in the plaintiff's position would respond is part of an objective standard).

192. See *Hansen v. SkyWest Airlines*, 844 F.3d 914, 926–27 (10th Cir. 2016).

193. *Kanzler v. Renner*, 937 P.2d 1337 (Wyo. 1997).

194. *Id.* at 1343–44.

195. See Robert L. Rabin, *Emotional Distress in Tort Law: Themes of Constraint*, 44 WAKE FOREST L. REV. 1197, 1207–08 (2009).

member of the community would find the behavior outrageous.¹⁹⁶ The outrageousness test has been criticized as value-laden and vague.¹⁹⁷ The Restatement (Third) of Torts recognizes the difficulty of applying the outrageousness standard, but concludes that the case law provides sufficient guidance.¹⁹⁸

A few common law courts have particularized the outrage standard in hostile work environment claims brought under IIED. In *Pavilion v. Kaferly*,¹⁹⁹ the court found that where the defendant continually pressured an employee for dates and offered her money for sexual favors, the defendant's actions created a cumulative pattern of behavior such that "a woman of ordinary morality and sensibilities" would perceive them to be sufficiently offensive and sinister, rising to the level of extreme and outrageous behavior.²⁰⁰ Applying the same (outmoded) version of the reasonable woman test, the court in *Pavlik v. Kornhaber*²⁰¹ found that a plaintiff stated a claim for IIED in the employment context by alleging a campaign of sexual harassment through the defendant's persistent notes, sexually explicit comments, calling of meetings to discuss his desire for sexual contact, and lewd behavior.²⁰²

These limiting tests—the NIED and IIED reasonable person reaction limitation and the IIED outrageousness test—reflect the normative view that we cannot and should not compensate for every stress and emotional hardship inflicted by others that individuals suffer throughout life. Tort law seeks to strike an appropriate balance

196. See RESTATEMENT (SECOND) OF TORTS § 46 cmt. d (AM. LAW INST. 1965) ("[T]he case is one in which the recitation of the facts to an average member of the community would arouse his resentment against the actor, and lead him to exclaim, 'Outrageous!'"); see also *Kanzler*, 937 P.2d at 1341–42.

197. See Daniel Givelber, *The Right to Minimum Social Decency and the Limits of Evenhandedness: Intentional Infliction of Emotional Distress by Outrageous Conduct*, 82 COLUM. L. REV. 41, 51–53 (1982); Cristina Carmody Tilley, *The Tort of Outrage and Some Objectivity About Subjectivity*, 12 J. TORT L. 283, 284 (2019) [hereinafter Tilley, *The Tort of Outrage*].

198. RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 46 cmt. d (AM. LAW INST. 2012). As the Restatement describes:

Whether an actor's conduct is extreme and outrageous depends on the facts of each case, including the relationship of the parties, whether the actor abused a position of authority over the other person, whether the other person was especially vulnerable and the actor knew of the vulnerability, the motivation of the actor, and whether the conduct was repeated or prolonged.

Id.

199. *Pavilion v. Kaferly*, 561 N.E.2d 1245 (Ill. App. 1990).

200. *Id.* at 1251.

201. *Pavlik v. Kornhaber*, 761 N.E.2d 175 (Ill. App. 2001).

202. *Id.* at 186.

between the right to liberty and the right to security.²⁰³ When it comes to emotional harm, the law favors autonomy over security when the reaction goes beyond the value-laden reasonable reaction norm. It is noteworthy that the reasonable or “appropriate” reaction doctrine developed over hundreds of years during which the tools to measure the reactions of people to stress and emotional injury were not as accurate or developed.²⁰⁴

Differences in gendered perspectives and experiences of harassment have been documented in numerous social science studies.²⁰⁵ The studies finding sex-biased differences have concluded that females are more likely than males to perceive certain behaviors as harassing.²⁰⁶ This difference suggests that the “truth” of the encounter may sometimes depend on the sex of the actor.²⁰⁷ Under this view, harm affects women and men differently.²⁰⁸

Neurobiology research will help inform this debate. It gives us one more data point documenting differences in the perceptions and processing of danger and threats. If the law takes those differences in experience into account, how do we untangle whether these differences in perception are biologically- or culturally-based, and should that

203. See Gregory C. Keating, *Reasonableness and Rationality in Negligence Theory*, 48 STAN. L. REV. 311, 360–64 (1996); Unikel, *supra* note 116, at 326. This stems from the basic proposition by Thomas Hobbes and John Locke that individuals are separate and autonomous in the state of nature and cannot exercise complete freedom of action without interfering with the rights and interests of others. Unikel, *supra* note 116, at 348; see also Zipursky, *supra* note 115, at 2163 (“When we require people to *be reasonable*, we are requiring them to constrain their conduct by reference to its potential impact on other individuals.”).

204. See Adam J. Kolber, *The Experiential Future of the Law*, 60 EMORY L.J. 585, 588–619, 622 (2011).

205. See Barbara A. Gutek et al., *The Utility of the Reasonable Woman Legal Standard in Hostile Environment Sexual Harassment Cases: A Multimethod, MultiStudy Examination*, 5 PSYCH. PUB. POL’Y & L. 596, 602–04 (1999); Kerns, *supra* note 24, at 217.

206. Social science research suggests that women tend to see relatively more incidents and perceive greater harm from those incidents than men because “women tend to be the victims in sexual harassment encounters.” Barbara A. Gutek, *Understanding Sexual Harassment at Work*, 6 NOTRE DAME J.L. ETHICS & PUB. POL’Y 335, 343 (1992).

207. See CHAMALLAS, INTRODUCTION TO FEMINIST LEGAL THEORY, *supra* note 176, at 315.

208. Drawing on this research, some theorists like Professor Kathryn Abrams have argued in favor of judging workplace harassment from the perspective of a reasonable victim. See Kathryn Abrams, *Gender Discrimination and the Transformation of Workplace Norms*, 42 VAND. L. REV. 1183, 1206 n.103 (1989). Abrams argues that women perceive sexual harassment differently for several reasons, including reasons based on threats to personal safety and structural reasons such as precarious positions in the workplace relative to men. *Id.* at 1205–09. The area of sexual harassment in the workplace has received much scholarly attention. See, e.g., Ehrenreich, *supra* note 150, at 1193–1201; Susan Estrich, *Sex at Work*, 43 STAN. L. REV. 813, 816–26 (1991).

matter in this context?²⁰⁹ For example, men and women may exhibit different, but objectively measurable, physiological brain responses to the perception of physical danger. Neuroscience may suggest that the pain and emotional injury from the behavior suffered by the victim may be physiologically different depending on whether the victim is male or female.²¹⁰

In her path-breaking work, Professor Martha Chamallas has examined both the NIED and IIED claims from a feminist perspective. Under this lens, Chamallas has argued that IIED claims of hostile work environment should move away from universal approaches to harassment; instead they should be based on features of a person's identity such as race and sex.²¹¹ She would incorporate the victim's perspective into determining whether actionable harm has occurred.²¹²

Relatedly, Professors Martha Chamallas and Jennifer Wiggins have argued that the common law's reluctance to compensate for claims of NIED is not due solely to the traditional explanations of the difficulty of measuring the harm or the fear of disproportionate liability, but instead traces to the gender and race of the victims.²¹³ According to this view, tort law is less willing to recognize emotional distress claims because these injuries were associated more with women's reality than men's; the devaluation of the claim reflected

209. Papillon argues, for example, that stress, including social stress from sexual harassment, can increase inflammation in the victim's body and affect healing and aging. See Kimberly Papillon, *The Neuroscience and Epigenetics of Sexual Harassment: Brain Reactions, Gene Expressions, and the Hostile Work Environment Cause of Action*, 7 TENN. J. RACE, GENDER & SOC. JUST. 1, 67–68 (2018) (indicating that harassment can make the victim more vulnerable to physiologic and psychological injury). Professor Cristina Tilley suggests that neuroscience may provide objective evidence as to whether the test of outrage has been sufficiently satisfied. Tilley, *The Tort of Outrage*, *supra* note 197, at 312 (“[T]he law’s search for ‘outrageous’ behavior may be understood as a search for scientifically maladaptive aggression.”).

210. See Papillon, *supra* note 209, at 61, 66–69 (describing how workplace microaggressions “focus[ed] on gender” can lead to negative epigenetic changes for females); Lisa Molix, *Sex Differences in Cardiovascular Health: Does Sexism Influence Women’s Health?*, 348 AM. J. MED. SCI. 153, 153–54 (2014); Susan H. Berg, *Everyday Sexism and Posttraumatic Stress Disorder in Women: A Correlational Study*, 12 VIOLENCE AGAINST WOMEN 970, 983–84 (2006).

211. See Martha Chamallas, *Discrimination and Outrage: The Migration from Civil Rights to Tort Law*, 48 WM. & MARY L. REV. 2115, 2174–79 (2007).

212. *Id.* at 2175–79.

213. See CHAMALLAS & WRIGGINS, *supra* note 173, at 185–87; Martha Chamallas, *The Architecture of Bias: Deep Structures in Tort Law*, 146 U. PA. L. REV. 463, 499 (1998) [hereinafter Chamallas, *The Architecture of Bias*] (“[L]egal claims for emotional distress have been devalued in part because they are associated with female plaintiffs.”). Professor Govind Persad has noted similar observations. See Govind Persad, *Law, Science, and the Injured Mind*, 67 ALA. L. REV. 1179, 1197–98 (2016) (“[S]everal commentators have complained that the disfavoring of emotional distress torts represents an unjustified bias that is particularly disadvantageous to female plaintiffs.”).

women's lower status in society.²¹⁴ Drawing on cultural feminism theory, they argue that limiting NIED claims "reflects a masculinist viewpoint that values pecuniary interests over intimacy"²¹⁵ As they state, "[d]evaluation is a kind of bias that . . . affects value judgments, such as those made about the seriousness of certain conduct or the importance of an activity" or an injury.²¹⁶

Neuroscience studies may offer further support for this "devaluation" argument from a physiological standpoint.²¹⁷ Beyond cultural biases, science may eventually support this argument by tracing average sex differences in reactions to extreme stress, trauma and the storage of emotional memory to biological underpinnings. As discussed earlier, studies involving the amygdala, the hippocampus, the medial prefrontal cortex, and stress hormones suggest that there may be specific sex-based mechanisms involved in these behaviors.²¹⁸ The differences may explain, among other things, the higher incidence of PTSD in women, and may suggest that women experience certain emotional harms differently and disproportionately.

B. *Recognizing Differences*

If neuroscience demonstrates these differences, how should it inform the law? Would these findings justify incorporating those differences into the standardization of reasonably expected harm of the inflicted stress or outrageousness of behavior?²¹⁹ On one hand, if we do

214. Chamallas, *The Architecture of Bias*, *supra* note 213, at 469. The law, under this view, fails to attach sufficient value to "caring, nurturing, empathy, and intimate human connections[.]" such as are recognized in NIED bystander claims. CHAMALLAS & WRIGGINS, *supra* note 173, at 25.

215. *Id.* at 25–26.

216. Chamallas, *The Architecture of Bias*, *supra* note 213, at 470.

217. For a fascinating review of the physiologic impact of sexual harassment in the workplace, see generally Papillon, *supra* note 209 (arguing that neuroscience and epigenetics can be used to accurately assess the victim's injury and damages, as well as assess the brain reactions of the onlookers—judges, jurors, witnesses, harasser, and employers—to the harassment). Because this article focuses on man-on-woman sexual harassment, it discusses the physiologic effects of harassment on female victims. *See id.* at 66–69 n.14.

218. We are already noting these differences with regard to the incidence of PTSD in males and females. *See supra* notes 34–62 and accompanying text. The emerging research on stress, the fear response, and memory processing suggest that women and men may create and retain memories of emotional material differently, which could influence how we control learned fear and anxiety and may account for differences in population rates of associated brain disorders like PTSD. *See id.*

219. Even if courts do not use this categorical evidence to adopt a reasonable woman standard for limited application, they still could allow expert testimony to weigh the reasonableness of the emotional distress before ruling on a motion to dismiss or motion for summary judgment. *See Forest v. Pawtucket Police Dep't*, 290 F. Supp. 2d 215, 232 (D.R.I. 2003)

not recognize sex-based brain differences and we hold men and women alike to the same universalized ability to withstand different types of emotional harm, then the law might ignore emotional harms that fail to meet a masculine-oriented objective standard and that are suffered disproportionately by women. This seems unfairly punitive.

On the other hand, if we apply different thresholds to emotional harm claims, based on this science, this application could reinforce stereotypical perceptions of female fragility and inadequacies.²²⁰ This may additionally lead to the unintended consequence of “blaming the victim.” Further, if the law begins to differentiate between types of reactions, then people may be overly cautious—and overdeterred—in their interactions with women.

Neuroscience evidence can inform the law, but it need not control it. Normative values cannot be divorced from how the law views emotional harm. Even if we can empirically demonstrate distinct male-oriented or female-oriented responses to how extreme stress is experienced and processed, the question still remains of whether the law *should* reflect differentiated experiences.²²¹

Demonstrated average sex-based biological differences to reactions to extreme stress may not be sufficient to overcome our society’s ideological commitment to a single, egalitarian standard of reasonable care. This view starts with the assumption that “promoting equality and social justice through tort law is a legitimate enterprise.”²²² Holding men and women to the same universalized reasonable person reaction standard has the enormous advantage of not reinforcing sex differences and inequality. Even if neuroscience advances legitimately challenge this assumption and quantify the disparate impact that such a universal standard may have on women, we may not be willing to recognize those differences in order to promote the value of a single

(recognizing the value of expert testimony to prove elements of an IIED claim at the summary judgment phase).

220. Examples abound of stereotypical views of the female nature. Jean-Jacques Rousseau articulated it this way: “A perfect man and a perfect woman ought no more to resemble each other in mind than in features; . . . One must be active and strong, the other passive and weak. One must needs have power and will, while it suffices that the other have little power of resistance.” JEAN-JACQUES ROUSSEAU, *ROUSSEAU’S EMILE OR TREATISE ON EDUCATION* 260 (William H. Payne trans., D. Appleton & Co. 1918) (1762).

221. See, e.g., Erica Goldberg, *Emotional Duties*, 47 CONN. L. REV. 809, 842 (2015) (arguing for individual responsibility to take care of ourselves that “limits the duties others owe to avoid distressing us”).

222. See CHAMALLAS & WRIGGINS, *supra* note 173, at 190. Many scholars recognize that tort law has an expressive function. See, e.g., Cass R. Sunstein, *The Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2021–22 (1996).

standard of care.²²³ We do not want to stigmatize women as a group that is different or inferior.²²⁴

Another approach would be to incorporate documented differences in emotional experience into a general reasonable person standard. To accomplish this, the court would instruct the jury that in applying the reasonable person standard, it is permissible to take into account average sex-based differences in emotional injury perception and experience.²²⁵ This would avoid a formal, bifurcated standard. Of course, assuming our standards have evolved to a sort of hyper-masculine “reasonable person,” in which individuals are expected to assume the risk of most severe emotional harms, society could benefit from adjusting the reasonable person standard in this way (as an alternative to having varying standards based on sex, or only male-based standards). The law would adjust to include the deterrent force of possible liability based on the science about harms to women from severe stress and emotional injury.²²⁶

If we move beyond the normative value of equality in law strongly promoted by liberal feminist legal theory and accept that the due care standard for emotional harm should selectively recognize a bifurcated reasonableness standard, we need to be extremely cautious in determining when to proceed. This is complicated territory. This question assumes that it is even possible to untangle how biology influences individuals from the reinforcement of cultural stereotypes,

223. See Schlanger, *supra* note 147, at 139 (describing how courts have “refused to hold women to a norm of timidity”).

224. Professor Mayo Moran, in examining some areas of criminal law where the reasonable person standard is used (such as self-defense, provocation, and sexual assault), ultimately concluded that subjectivizing the standard will not enhance equality. MORAN, *supra* note 111, at 202–31. Instead, she found that subjectivizing the standard in those contexts would enable perpetrators to invoke discriminatory stereotypes, which may leave judges with simple questions of credibility. As she stated, “[t]he more widely held such beliefs, the more credible they will be.” *Id.* at 230 (“Subjectivizing the standard, far from promoting equality, simply seems to give more unfettered play to the very beliefs that are most likely to undermine equality.”).

225. Admissibility of evidence and other evidentiary questions are beyond the scope of this Article. See *supra* notes 112–114 and accompanying text.

226. An example of this line of thinking arises in lawsuits challenging paternity leave policies that differ for men and women. See, e.g., *Savignac v. Jones Day*, No. 1:19-cv-02443-RDM, 2020 WL 5291980, at *5 (D.D.C. Aug. 13, 2019) (describing plaintiff’s argument that men should be given the same paternity leave as women); see also Barbara Y. Welke, *Unreasonable Women: Gender and the Law of Accidental Injury, 1870–1920*, 19 LAW & SOC. INQUIRY 370, 372 (1994) (arguing that gender shaped the development of negligence law, and legal precedents that initially favored women became available to men as well). As Professor Barbara Welke pointed out, “[a]ll passengers of railroads, for example, benefitted from the longer stops required for ladies to alight.” *Id.*

which may not be attainable.²²⁷ Causal issues may also simply be too difficult to unpack.²²⁸ The significance of the evidence may not be clear,²²⁹ and the magnitude of the differences may not be great.²³⁰ We

227. In the context of antidiscrimination law, Professor Katherine Franke argues:

almost every claim with regard to sexual identity or sex discrimination can be shown to be grounded in normative gender rules and roles. Herein lies the mistake. . . . [S]exual equality jurisprudence has uncritically accepted the validity of biological sexual differences. By accepting these biological differences, equality jurisprudence reifies as foundational *fact* that which is really an *effect* of normative gender ideology. . . . In many cases, biology operates as the excuse or cover for social practices that hierarchize individual members of the social category ‘man’ over individual members of the social category ‘woman.’

Katherine M. Franke, *The Central Mistake of Sex Discrimination Law: The Disaggregation of Sex from Gender*, 144 U. PA. L. REV. 1, 2–3 (1995); see also Sherrine M. Walker & Christopher D. Wall, *Feminist Jurisprudence: Justice and Care*, 11 B.Y.U. J. PUB. L. 255, 281 (1997) (“To listen to this feminine voice . . . would be to compound the effects of age-old male domination and reaffirm the male-induced . . . roles adopted by women.”).

228. For example, societal influences like poverty and crime could also account for differences in perception and reaction to emotional harm. See Tama Leventhal & Jeanne Brooks-Gunn, *Moving to Opportunity: An Experimental Study of Neighborhood Effects on Mental Health*, 93 AM. J. PUB. HEALTH 1576, 1576 (2003) (finding that a policy that moved families out of high-poverty areas had a positive effect on mental health); Amber L. Pearson & Gregory D. Breetzke, *The Association Between the Fear of Crime, and Mental and Physical Wellbeing in New Zealand*, 119 SOC. INDICATORS RSCH. 281, 289 (2014) (discussing the relationship between fear of crime and “certain physiological changes and unhealthy behavior patterns”); Kevin M. Simon, Michaela Beder & Marc W. Manseau, *Addressing Poverty and Mental Illness*, PSYCHIATRIC TIMES (June 28, 2018), <https://www.psychiatristimes.com/special-reports/addressing-poverty-and-mental-illness> [<https://perma.cc/77XC-N48T>].

229. Use of social framework evidence remains controversial. See Melissa Hart & Paul M. Secunda, *A Matter of Context: Social Framework Evidence in Employment Discrimination Class Actions*, 78 FORDHAM L. REV. 37, 41–44 (2009) (describing the use of social framework evidence in matters such as reliability of eyewitness identification, the battered woman’s syndrome, and employment discrimination).

One unanswered question is whether—and at what point—average differences may be used in law and policy decision-making. Average differences may be used to disadvantage women as a class, or to disadvantage individual women who are not “average.” For example, if science shows that women on average are more vulnerable to PTSD than men due in large part to differences in brain structure and function, could women be removed from combat duties? Though such a decision would surely be “because of sex,” would the military be able to raise a defense that this is a bona fide occupation qualification (“BFOQ”)? How much greater would the risk have to be to qualify as a BFOQ? Should an individual woman be given the opportunity to argue that the policy is not applicable to her given her individual resiliency?

Normative views would also come into play in addressing this question. Professor Catharine MacKinnon argues that the essence of unlawful unequal treatment is not difference—men are just as different from women as women are from men—but a socially-imposed hierarchy. See Catharine A. MacKinnon, *Equality*, 149 DAEDULUS 213, 213–15 (2020) (arguing for “substantive equality”). In other words, the *consequences* of the difference are socially determined. Under this view, women should not be deprived of the opportunity to serve in combat and may accept the potential for the greater risk of PTSD, as men also have the potential to suffer from PTSD in combat and have been given the opportunity to assume that risk.

230. See Gary T. Schwartz, *Feminist Approaches to Tort Law*, 2 THEORETICAL INQUIRIES L. 175, 189 (2001).

do not want to view women as a monolithic group that universally shares certain essential experiences.²³¹

A danger of using neuroscience studies to reflect average differences is that this approach may open the door to individualized standards, under which a person with a particular diagnosis or cultural background is more or less culpable for various activities. This would undermine a primary goal in tort law of deterring certain behaviors in everyone, regardless of ability or background: we do not want the intellectually disabled to maintain their property in ways that could prove dangerous to their neighbor nor do we want inexperienced or ignorant drivers to ignore their failing brakes. This argues in favor of broader, sex-neutral standards of care in most situations.²³² Once we recognize further individualization of the victim's reactions to emotional harm, this realization argues in favor of individualizing characteristics of the tortfeasor as well.²³³

231. See *supra* notes 176–177 and accompanying text.

232. Neuroscience studies finding sex-based brain differences may have implications for other areas of tort law. For example, informed consent in the medical treatment context relies on the application of the reasonable person standard. Although the standard originally relied on the “professional” rule to determine what information on risks a medical provider needed to disclose to gain informed consent, this test has been replaced by the now-favored “patient” rule, which demands that the patient be offered information material to a reasonable person’s informed decision. See, e.g., *Matthies v. Mastromonaco*, 733 A.2d 456, 461–62 (N.J. 1999). The normative value underlying the test is that of individual autonomy: the patient, not the medical provider, should make the life decision about whether to undergo a particular procedure. See *id.* at 460. We rely on the objective reasonable person test—rather than what this particular patient would want to know—because of the complicated issue of causation. The patient would almost certainly testify (and believe) that she wanted full disclosure of all risks and would not have proceeded with the treatment if she had received it. Thus, the objective patient rule theoretically avoids the problem of bias and idiosyncrasy on the part of the patient. It also offers ease of administration: application of an individualized standard would eliminate any standard altogether. But if science can show that women and men, on average, process bodily risks differently in given situations, this would suggest that a sex-based standard is not too idiosyncratic or individualized. Instead the standard could recognize broad group differences in reactions. A blended standard of informed consent could govern a sex-based view of autonomy and bodily integrity. Cf. Chamallas, *Feminist Legal Theory and Tort Law*, *supra* note 111, at 395–96 (drawing an analogy from the medical-based informed consent doctrine to outline sufficient consent in sexual assault tort claims, which would require defendants to obtain a sexual partner’s affirmative permission to proceed or face liability). Similarly, the standard of care for treatment of brain disorders would now necessarily take into account whether the patient is male or female. For example, female athletes may be more likely to suffer concussion injury than male athletes during their career, which may be related to brain physiology differences. Tatyana Mollayeva, Graziella El-Khechen-Richandi & Angela Colantonio, *Sex & Gender Considerations in Concussion Research*, 3 CONCUSSION 1, 2 (2018); Randy Dotinga, *Concussions More Likely in Female Athletes*, WEBMD (Feb. 28, 2017), <https://www.webmd.com/brain/news/20170228/concussions-more-likely-in-female-athletes> [<https://perma.cc/RUA8-E7LL>].

233. Although the law does not individualize reactions to extreme stress when these reactions are used as part of an element of duty or breach, the law individualizes injuries for damages under

Furthermore, the problems of administrability may be too complex.²³⁴ On one hand, we do not want a standard that is too fluid with each new scientific advance—it would be counterproductive to retool constantly what it means to be “reasonable.” Recognizing differences could defeat the critical function of law to provide notice of standards of care.²³⁵ Nor should the law create a standard solely for the benefit of women.²³⁶ On the other hand, one benefit of the reasonable person standard is that theoretically we can adjust it periodically, reflecting significant changes in cultural attitudes, community values, and societal expectations of risk and safety.²³⁷ Substantial scientific advances may justify an adjustment to that standard.

Additionally, we typically rely on judges and jurors to make these adjustments,²³⁸ but the views of those decision-makers may be subject to bias as well. Neuroscience may eventually enable us to make our community standards of a reasonable reaction more objective for men and women, without relying on the subjective view of a jury of twelve or fewer people. This evidence could possibly allow us to determine general standards of reasonableness for men and women in certain

the eggshell plaintiff rule. Once the tortfeasor is found to have breached his duty of due care in a way that caused injury, the law holds the tortfeasor responsible for all injuries, even unusual or idiosyncratic ones. *See DOBBS ET AL.*, *supra* note 120, § 15.11.

234. Assuming the concept of a reasonable woman’s standard gains judicial acceptance, courts and litigants will need to work out various practical issues in applying the standard. Will application of the standard be case-specific, requiring the plaintiff to present expert and other proof that the standard is appropriate in her particular case? What evidence will the defendant be permitted to introduce to challenge use of the standard? Will these admissibility issues be handled outside the jury’s presence? *See, e.g.*, Fed. R. Evid. 104. How should the jury be instructed? For example, will the jury be instructed to apply a reasonable woman’s standard to certain elements of emotional harm claims, or will they be instructed that they may consider sex-based brain differences when applying a reasonable person standard? These and other issues will all need to be considered, although they are beyond the scope of this Article.

235. *See DOBBS ET AL.*, *supra* note 120, § 10.11.

236. Defendants could conceivably raise equal protection challenges to the use of a reasonable woman standard, claiming that the standard does not survive intermediate scrutiny. *See, e.g.*, *Frontiero v. Richardson*, 411 U.S. 677, 682–83 (1973). While future scholarship may address this constitutional question, we can presume the same scientific evidence that shows sex-based distinctions in emotional distress responses would also be used to meet any constitutional challenge.

237. *See Cristina Carmody Tilley, Tort Law Inside Out*, 126 *YALE L.J.* 1320, 1356, 1364 (2017).

238. *See DOBBS ET AL.*, *supra* note 120, § 10.12; Calnan, *supra* note 116, at 15 (“[L]aw’s longstanding norms are constantly mediated by judges and juries informed by prevailing social values.”); Welke, *supra* note 226, at 386 (explaining that an explicitly bifurcated standard of due care for men and women did not develop historically because jurors implicitly assumed that jury instructions on reasonableness reflected different community expectations of reasonable behavior for men and women).

limited areas like severe emotional harm, informing a normative judgment of a reasonable reaction. This would help determine the limits of duty—if there are objective average differences in reactions to severe emotional harm, that evidence can help delineate the contours of the duty.²³⁹ In broadening the standard of care to include both women’s and men’s perspective of reasonableness, we certainly do not want to simply incorporate female stereotypes along with male stereotypes into the standard. This approach would not advance gender equality.²⁴⁰

CONCLUSION

Women are different from men in some ways, but these differences do not reflect deficiencies or weaknesses. When law accounts for differences correctly, this approach should reinforce the law’s core values of neutrality and equal treatment, while recognizing the implications of important empirical differences. The increased ability to quantify sex-based brain differences in experiencing and processing emotional harm should force courts and legislatures to rethink whether a single reasonable person standard suffices in every instance. We need to make sure the differences are real and significant. An indivisible view of reasonable women potentially could minimize their commonalities with men. This view also has the danger of ignoring the differences among women. At the same time, we use an empirically informed standard of reasonableness in many contexts; these discoveries would provide us with one more data point to use, though the data would not be determinative. It simply supports an argument to recalibrate a reasonableness standard informed by

239. See Miller & Perry, *supra* note 122, at 367–68 (“[A]ny rule needs some content—at a minimum, some general guidelines that will enable courts to adjudicate nonarbitrarily and allow potential injurers and victims to prepare for contingencies.”).

240. It is critical to enter this discussion cautiously. For example, could neuroscience research support an argument that there are sex-specific differences in cognitive abilities that implicate workplace discrimination claims? This issue, once addressed by Dr. Larry Summers to much controversy, see Scott Jaschik, *What Larry Summers Said*, INSIDE HIGHER ED (Feb. 18, 2005), <https://www.insidehighered.com/news/2005/02/18/what-larry-summers-said> [<https://perma.cc/PQP4-H3QK>], resurfaced in the lawsuit brought by James Damore, a former Google software engineer. When Google fired Damore, he filed a lawsuit claiming that Google discriminates against white men with conservative views. He argued that inherent biological differences and not the lack of opportunity or prejudice explained the shortage of women in leadership and technical positions in the tech industry. Louise Matsakis, *Labor Board Rules Google’s Firing of James Damore Was Legal*, WIRED (Feb. 16, 2018, 6:31 PM), <https://www.wired.com/story/labor-board-rules-google-firing-james-damore-was-legal> [<https://perma.cc/HZ6A-5SY7>].

objective phenomena in processing emotional harm in certain limited circumstances.

As Professors Martha Chamallas and Linda Kerber remarked in the context of fright-based claims,

[t]hat recognizing difference may lead to marginalization, while ignoring difference may lead to inequitable results, has long been the Scylla and Charybdis of feminist theory. A major goal of feminist theory is to find a route past these monsters: first, by being skeptical of conceptual dualisms enshrined in familiar cultural and legal practice, and second, by unmasking claims of difference to reveal unstated norms against which difference is judged.²⁴¹

Neuroscience may help us find that route.

This exploratory Article raises more questions than it answers. The science on sex-based brain differences is nascent and the legal implications myriad. Although we need to proceed cautiously, we should not fear this line of research. Understanding human behavior is a critical enterprise and noble goal.²⁴² This is the time to begin the conversation about implications in tort law from sex-based brain differences.

241. Martha Chamallas & Linda K. Kerber, *Women, Mothers, and the Law of Fright: A History*, 88 MICH. L. REV. 814, 863 (1990).

242. See ANTONIO R. DAMASIO, *THE STRANGE ORDER OF THINGS: LIFE, FEELINGS, AND THE MAKING OF CULTURES* 171, 243 (2018). As Professor Antonio Damasio has stated, “It is often feared that greater knowledge of biology reduces complex, minded, and willful cultural life to automated, pre-mental life[.]” but instead, advances in science “achieve[] something spectacularly different: a deepening of the connection between cultures and the life process[.]” and thus “reinforce[] the humanist project.” *Id.*