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Adjudicating Adjudication and the Problem of Epistemic Caution

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Abstract: Does evidence of a biomechanical cause of psychopathy reduce sentencing to the same extent for male and female judges? A recent experiment found that when psychiatric evidence of criminal psychopathy was supplemented by evidence of an underlying biomechanism, judges assigned shorter average sentences and were more likely to cite at least one mitigating factor of psychopathy in accompanying written opinions. But it remains unclear whether the absence of neurobiological evidence justifies the retention of longer sentences, and unclear whether the opinions of this judicial sample are widely held, or reflect the unique demographics of the U.S. state trial judiciary.

Specifically, previous research has found systematic differences in the credence that men and women give to different kinds of scientific explanations, and this research suggests that the discovered scientism among U.S. state trial judges may be moderated by the gender ratio of that population, which is skewed heavily toward men. Here, a reanalysis of the data in which this effect was first revealed found no effect of biomechanism on female judges' sentencing or opinions. These results suggest that it is worth further investigating whether the overrepresentation of men on the bench may lead to a hard-scientific bias in U.S. state courts. Additionally, the findings highlight the need to develop a scientific understanding of the social forces that give rise to these gender differences in the first place, and reveal problems with a concept that I develop and critique called the *principle of epistemic caution*.

Keywords: behavioral genetics, forensic neuroscience, gender differences, legal psychology, moral psychology, neuroethics, neuropsychiatry, psychopathology

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As scientific understanding of the relationship between neurobiology and behavior becomes increasingly sophisticated, policymakers are faced with the challenge of assuring that this new knowledge is applied in ethical ways. There seems to be implicit agreement among scientists and philosophers that it is our responsibility to adhere to a *principle of epistemic caution*, according to which our neuroethical policies should never outpace our neuroscientific knowledge. But this principle may have the paradoxical effect of preventing some life-or-death decisions from being made on the basis of uncertain scientific premises, only to allow those choices to be decided by systemic social inequalities. Here, I discuss a neurogenetic allele whose influence on behavior is unclear to scientists, whose potential philosophical implications remain disputed by ethicists, yet whose exclusion from the courtroom has clear and troubling inegalitarian implications. I use the case to raise awareness of, and address some of the injustices associated with, the apparently gendered nature of contemporary public understanding of neuroscience.

1. Introduction

Research into the relationship between criminal justice and neuroscience is important, but its impact will be limited until a more fundamental issue has been addressed. This issue concerns the ways in which societal values infuse not only the public's attitudes toward criminal justice, but also their attitudes toward neuroscience—and toward psychiatry, as well. I argue that we cannot always reduce systemic injustice by increasing reliance on the scientific standards of neurobiology, because those very standards are determined by a society beset by systemic injustices. Thus, I advocate devoting resources to studying the effects of sociocultural factors on neuroscientific and neuroethical beliefs. Addressing the ways that prejudices in our society and in our educational system influence public attitudes toward psychiatry and neuroscience, I argue,

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is a necessary step if we are to keep those prejudices from taking a toll on our justice system.

To be clear, my aim here is not to evaluate the legal, moral, or practical significance of psychiatric and neuroscientific explanations of behavior *per se*. Potential evaluations of such explanations will be discussed, but will not be the primary focus of attention here. My central aim will only be to discuss the legal, moral, and practical implications of gender differences in the *perceived* significance of such explanations. To facilitate this discussion, I focus on the practical effects—rather than the theoretical appropriateness—of introducing neurobiological testimony into trials of criminal psychopaths.

The centerpiece of this essay will be new empirical evidence showing that male and female judges in the U.S. state court system differ in their sentencing of violent criminals who have been diagnosed with psychopathy. These data further reveal that when a neurobiologist presents additional evidence of a potential biomechanical cause of criminals' psychopathy, this gender difference goes away. *Prima facie*, testimony that might reduce the unjust association between a criminal's sentence and the gender of his or her judge is a good thing, especially since 73% of U.S. state trial judges are men (Kimball *et al*., 2013). Given that a democratic government is supposed to reflect the will of the people without prejudice for one gender over the other, excluding evidence with the potential to remediate this sort of unjust representation seems to be a good thing. However, there are significant scientific and moral concerns about introducing such testimony, as I will explain in the next section.

2. Background

In a recent experiment, Aspinwall, Brown, and Tabery (2012a) found that U.S. state trial judges who read both a psychiatrist's and a neurobiologist's testimony regarding the causes of a

criminal defendant's psychopathy (Hare *et al*., 1990) assigned shorter average sentences than judges who only a read psychiatrist's testimony. Differences in sentencing seemed deliberative, as supplementary neuroscience testimony led to more frequent mention of psychopathy as a *mitigating factor* in judges' written explanations of their reasoning. In other words, judges who read both psychiatric *and* neurobiological testimony were more likely than judges who read *only* psychiatric testimony to view the defendant's psychopathy as providing *legal grounds to adjust his sentence downward* according to the United States Code (18 U.S.C. §3553, 2012). These findings highlight some important issues in determining the appropriateness and admissibility of neuroscience testimony in the courtroom.

The background information that follows is divided into three sections. The first of these sections is devoted to unpacking what I call the *principle of epistemic caution*, and to describing some reasons that we should adhere to it—and some reasons that we should perhaps not adhere to it. In second background section, I discuss some of what we know about the ways in which U.S. state trial judges approach psychiatric and neurobiological evidence of psychopathy. In that section, I also lay out several reasons to think that these judges may be overvaluing neurobiological evidence of psychopathy. These reasons suggest that it may be in the best interests of justice to *exclude* such evidence from courtrooms. However, as I discuss in the third background section, there are countervailing reasons to think that justice would stand to benefit if we were to *include* such evidence—even though its scientific and moral value may be in doubt.

2.1. For and against epistemic caution

There are good reasons to take precautions against allowing an overzealous public to embrace

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neuroscientific claims that remain uncertain. In United States law, even evidence that rests on firm factual grounds can be excluded from trials if presenting that evidence might jeopardize the decision-making abilities of jurors. The Federal Rules of Evidence permits otherwise pertinent evidence to be excluded if its potential value in truth-seeking is overwhelmed "by the danger of unfair prejudice, confusion of the issues, or misleading the jury" (28 U.S.C. §403, 2011). These kinds of sentiments reflect what I have called the *principle of epistemic caution*.

When deciding which pieces of evidence or testimony to take into consideration, we believe it is important not to include claims that outstrip the reaches of our firmly rooted understanding. When the reach of our assertions goes beyond the grasp of our understanding, we run the risk of unfairly prejudicing, confusing, or misleading our audience. Thus, people tend to embrace the *principle of epistemic caution* not just with respect to neuroscience and the law, but also when making a broad range of epistemic and ethical judgments. This conservative approach to belief- and information-sharing may be especially laudable in the context of neuroscience, since recent research suggests that many people lend a degree of excess and unwarranted credence to neuroscientific explanations and evidence (Weisberg *et al*., 2008; Gurley and Marcus, 2008; Greene & Cahill, 2012; Saks *et al*., 2014). Adhering to a *principle of epistemic caution* is one way of minimizing the effects of such excess credulity. Still, a somewhat opposing view—that we should also be cautious about excluding such evidence—deserves at least some consideration.

There is no law, nor does it seem that there should be a law, allowing otherwise irrelevant evidence to be included just because that evidence has the potential to remediate undue prejudice. Yet some kinds of neuroscientific evidence, which may turn out to be morally or scientifically irrelevant to decisions about criminal punishment, might nonetheless be beneficial

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in adjudicating systemic prejudices. The framework within which we consider justice, I argue, should take into account not only the harms of including certain kinds of evidence, but also the harms of excluding some evidence, especially when that evidence might help ameliorate existing systemic injustices.

2.2. Worries about including neuroscientific explanations

There are reasons to think that presenting neuroscientific testimony to judges may increase the "danger of unfair prejudice, confusion of the issues" (28 U.S.C. §403, 2011). It remains unclear to neuroscientists how or even whether biomechanisms like the one described to the judges in the experiment relate to recidivism (Tikkanen et al., 2011) and reform (Lester & Eley, 2013). And the psychiatric diagnosis provided to judges in both experimental conditions used the Psychopathy Checklist Revised (Hare *et al*., 1990), which is actually a much better predictor of future violence than the neurogenetic polymorphism whose presence or absence made such a difference in sentencing. That x-linked allele is thought by some scientists to put males at increased risk for violent, antisocial, criminal behavior. But even if it does, its effect is thought to be relatively small.

In fact, although the allele may put men who have experienced childhood maltreatment at *increased risk* for violent behavior, it appears to place those who were not mistreated as children at *decreased risk* for that same kind of behavior (Tabery, 2009). A recent meta-analysis found that among females, that allele does not seem to predict violent behavior in either case, whereas a different polymorphism of the same gene does (Byrd & Manuck, 2014). And a longitudinal study of sibling pairs, which naturally corrected for confounding factors in arrest record such as race, failed to find any main or interactive effect of genotype on violent behavior (Haberstick *et al*.,

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2014).

There are also philosophical reasons to doubt that the influence of biomechanical factors on behavior could, in fact, be morally or legally exculpatory. First, it remains hotly contested among philosophers whether the loss of control to external influences on behavior—biomechanical or otherwise—mitigate one's degree of moral or legal responsibility. Kant argued forcefully that the loss of control due to external factors does indeed mitigate moral responsibility, contending that "there can be no moral risk" (1785). But many philosophers have questioned whether bad behavior is ever made excusable by the influence of external forces on that behavior (Williams, 1976). Moreover, it is not clear that biomechanical influences on behavior constitute external influences at all, rather than constituting the very internal control mechanisms for which people are generally held accountable.

Second, even if the loss of control to some external factors is relevant to a person's moral and legal status, there might not be anything especially exculpatory about the loss of control to biomechanical factors, as opposed to more ordinary factors like poverty, childhood maltreatment, and dumb luck (Nagel, 1979). Many bioethicists reject the idea that there is any "bright line" distinguishing the appropriate consideration of genetic from non-genetic influences on behavior (Silvers and Stein, 2003).

All of these considerations suggest that the sentences judges assign to criminal psychopaths may be biased by the *presence* of neuroscience evidence whose forensic and moral value is uncertain. Nonetheless, there are reasons to think that the *absence* of this same type of evidence might also be morally problematic. These problems do not arise due to the uncertainty of the evidence's factual value, but rather, due to the tendency of its exclusion to perpetuate a bias of the judicial system toward the opinions of male judges.

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2.3. Worries about excluding neuroscientific explanations

The worries about admitting neuroscientific testimony of criminal psychopathy are essentially about truth. Are such explanations scientifically sound, and if so, can sound moral arguments be founded upon them? In contrast, the worries about excluding such evidence are about the unequal representation of values. Is the scientific and moral weight people put into such explanations shaped by societal values that increase inegalitarianism? There are good reasons to think this may be the case. Some of these reasons can be drawn from research on public attitudes toward science. Previous research has revealed a number of ways in which public attitudes toward psychology and toward neurobiology tend to differ between men and women.

Such research has consistently found greater skepticism among men toward the import of psychiatric conditions, and greater skepticism among women toward expert claims about human biology. While there are many potential causes of these differences, it seems likely that social norms, expectations, and practices play an important role in causing these differences. But regardless of their causes, the present state of affairs in the United States is that these gender differences persist, and currently manifest in myriad ways.

In one study (Swami, 2012), participants were presented with a description of a person who manifested ten of the DSM-IV symptoms of major depression. Compared to women, men felt less sympathy for him, found his condition less distressing, and were less likely to recommend that he seek treatment. They were also more than twice as likely to deny that he had any mental health condition at all. Another study found that men were less likely than women to endorse treatment of ADHD, to consider it "real," or even to have heard of it (McLeod *et al*., 2007).

Previous research has also found that women tend to be more skeptical than men of

biotechnologies, especially about biotechnological policies that rely on the opinions of experts, rather than those of the public (Simon, 2010). One study found that scientific knowledge led women to be more skeptical toward scientific experts, whereas it led men to be more credulous toward experts (Hayes & Tariq, 2000). These gender differences in attitude toward science raise an important question: might the hard-scientific bias seen among U.S. state trial judges be an artifact of the gender imbalance in the American judiciary?

3. Experimental Reanalysis

These findings in the public understanding of science give rise to two hypotheses. In what follows, I lay out these hypotheses and the reasoning behind them. Then, I test these hypotheses, using the data from Aspinwall *et* al. (2012a; 2012b).

3.1. Hypotheses

The foregoing considerations suggest that a psychiatrist's diagnosis of psychopathy may be more readily dismissed by male judges than by female judges. This possibility is suggested by the previously discussed tendency of men in our society to be more skeptical than women toward psychiatric diagnoses. Alternatively, female judges may be less influenced by neurobiological testimony than male judges. Two reasons might explain this.

First, the difference could occur because, as the previously discussed research suggests, women tend to be more skeptical than men of biological explanations. Second, it could simply be that judges who accept the psychiatrist's testimony tend to find supplementary neurobiological explanations redundant, and therefore of little additional value in sentencing. Either way, male judges might be as likely, or nearly as likely, as female judges to factor

psychopathy into sentencing—but *only* when psychiatric diagnoses are supplemented by neurobiological explanations.

In light of Aspinwall et al.'s (2012) findings, we can also predict the potential effects of the interaction of gender with psychiatric and neurobiological testimony. Aspinwall et al. (2012) found that supplemental neurobiological testimony led to *increased* mention of psychopathy as a mitigating factor in sentencing, and to *decreased* overall sentence lengths. Therefore, should the hypothesized gender differences in the weighting of testimony have occurred, we could expect a clear pattern to emerge.

It seems likely, then, that the tendency to mitigate sentencing in the presence of supplementary neurobiological evidence (Aspinwall *et al*. 2012a, 2012b) would be stronger in male judges than in female judges. But given the above-mentioned evidence suggesting that men are more likely than women to be persuaded by the testimony of neurobiologists, it also seems likely that supplementing psychiatric explanations with neuroscientific information could close both of these gaps.

3.2. Results

Supplemental neurobiological testimony had no effect on the rate at which female judges mentioned psychopathy as a mitigating factor in sentencing (χ^2 = .00 p = 1.0). Female judges who read only psychiatric testimony mentioned psychopathy as a mitigating factor just as frequently as female judges who also read supplementary neurobiological testimony (*OR* = 1.0, 95% CI [0.2139, 4.6745]). However, supplemental neurobiological testimony did have a significant effect on the rate at which male judges mentioned psychopathy as a mitigating factor (χ^2 = 7.706, $p < .05$). Male judges who read only psychiatric testimony mentioned psychopathy

as a mitigating factor significantly less frequently than male judges who also read supplementary neurobiological testimony (*OR* = 0.3671, 95% CI [0.1793, 0.7517]).

Consequently, there was a significant gender difference in the mention of psychopathy as a mitigating factor among judges who read only psychiatric testimony ($\chi^2 = 4.12$, $p < .05$), but no such difference among judges who also read supplementary neurobiological testimony ($\chi^2 = .12$, p = .72) (Figure 1).

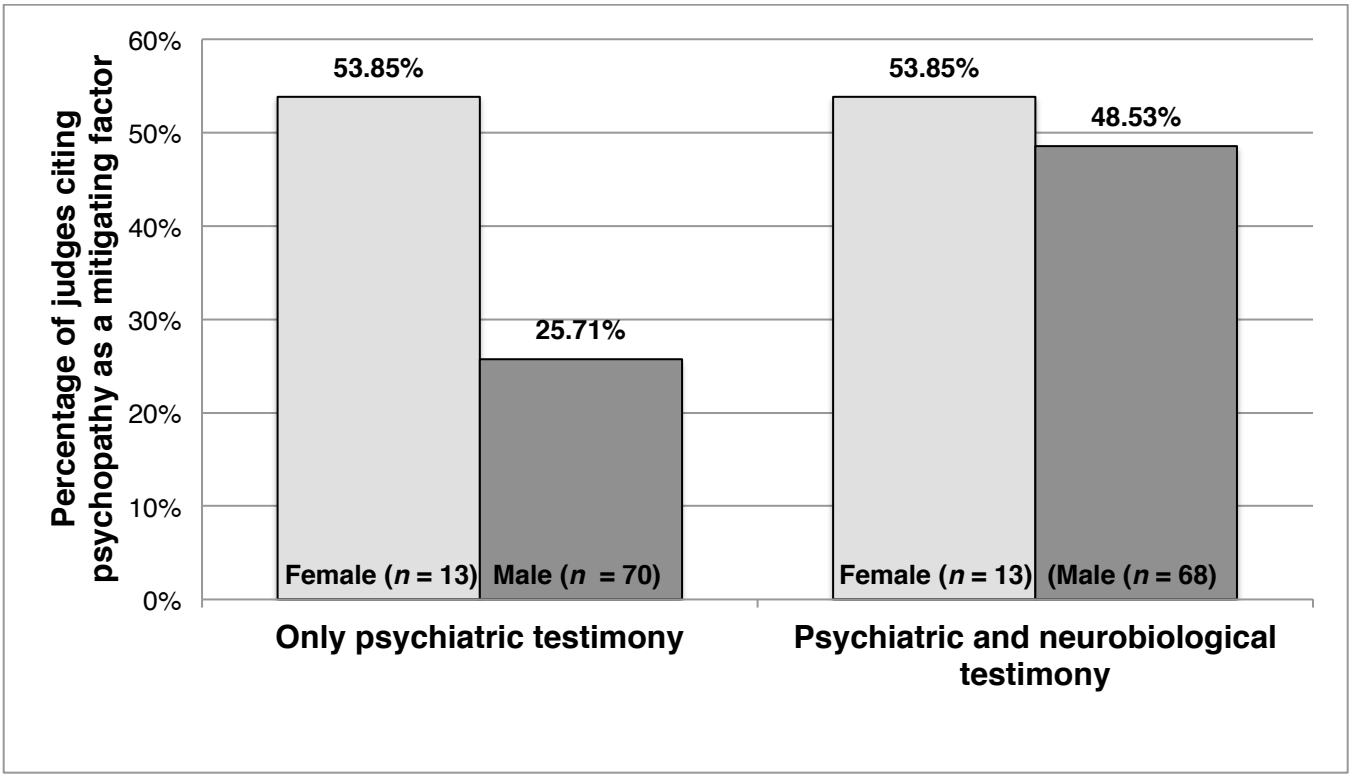

Figure 1. Gender differences in treating psychopathy as a mitigating factor, with and without neurobiological testimony. Among judges given *only* psychiatric testimony, male judges were less than half as likely as female judges to mention psychopathy as a mitigating factor in sentencing. But among judges given both psychiatric *and* neurobiological testimony, there was no significant gender difference.

A similar pattern emerged for sentencing recommendations. Female judges who read only psychiatric testimony assigned sentences that were not significantly different from those assigned by female judges who also read supplemental neurobiological testimony (M_D = -.313

years, *SEM* = 1.498). But male judges who read only psychiatric testimony assigned significantly longer sentences than male judges who also read supplemental neurobiological testimony (M_D = 3.556 years, *SEM* = 1.498).

This led to a significant gender difference in sentencing among judges who only read a psychiatrist's testimony ($F = 3.312$ $p < .05$), but no such difference among judges who also read a neurobiologist's testimony ($F = .037$, $p = .847$). Among judges presented with only a psychiatrist's testimony, the sentences assigned by male judges ($M = 14.71$ years) were 42.4% longer than those assigned by female judges. But among judges presented with both psychiatric and neurobiological testimony, the sentences assigned by male judges were only 4.3% longer than those assigned by female judges (Figure 2).

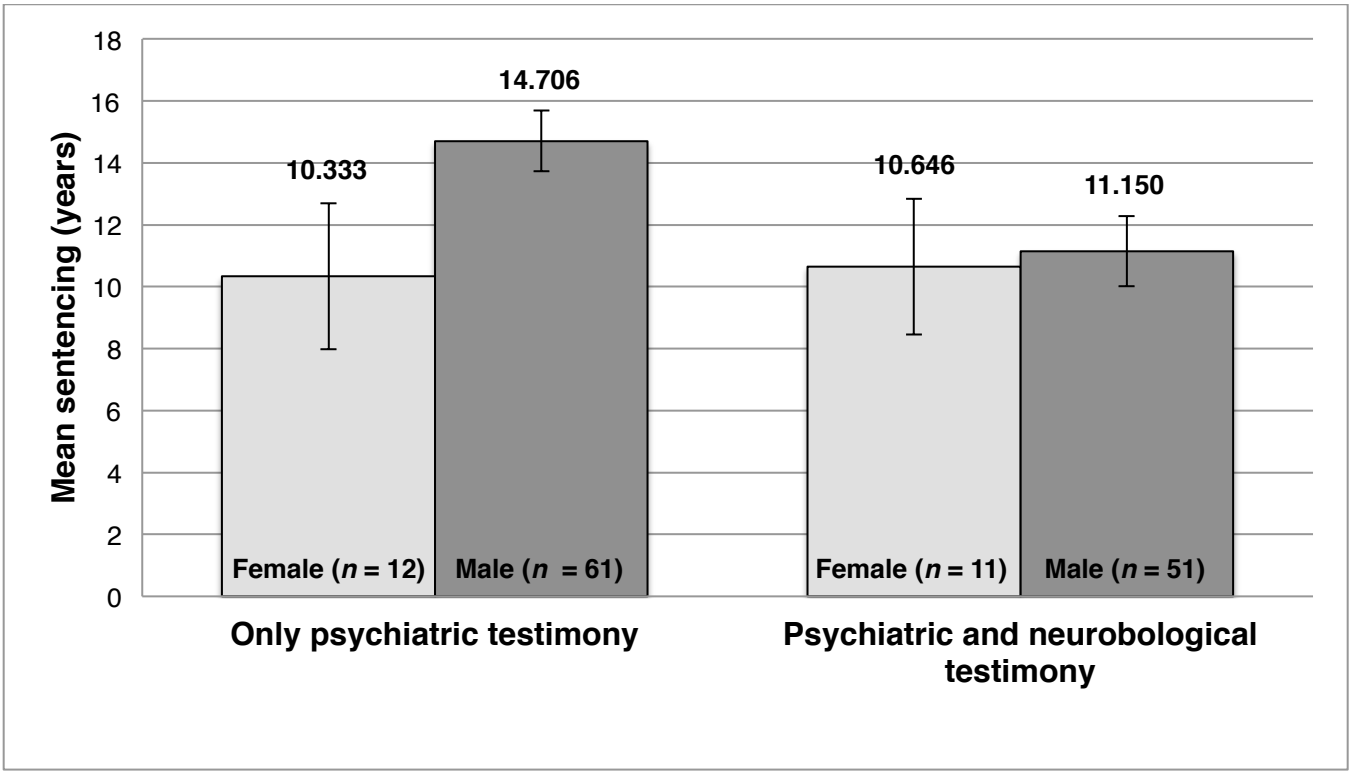

Figure 2. Gender differences in sentencing, with and without neurobiological testimony; error bars represent ±1 SEM. Among judges given *only* psychiatric testimony, male judges assigned sentences that were over 40% longer than those assigned by female judges. But among judges given both psychiatric *and* neurobiological testimony, there was no significant gender difference.

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4. Discussion

It seems that male judges discounted clinical diagnoses of psychopathy much more frequently than female judges did, but this gender difference was eliminated when a neurobiological characterization of psychopathy was introduced. When presented with supplementary testimony from a neurobiologist, male judges seemed to take evidence of psychopathy more seriously than they did otherwise. In such cases, they took psychopathy into consideration as a mitigating factor in sentencing just as frequently as female judges did. Since female judges were not moved any further by this supplementary testimony, the net result of its introduction was the elimination of any significant gender difference in the sentencing of criminal psychopaths.

4.1. Implications

These findings put defense counsels in a morally precarious position. In general, it is the defense counsel's responsibility to protect the interests of defendant. But suppose you are a public defender who has been assigned to represent a violent criminal. Although your resources are limited, you have secured a well-respected psychiatrist who has tested your client for psychopathy, and is willing to serve as an expert witness for the defense. In this case, the success of your defense seems to hinge on the gender of the judge who is assigned your case. Is that fair? And is it fair that, although you may not be able to obtain genetic testing, genetic testing may be a necessity if you are to secure a defense whose success does not depend on the gender of the judge? It seems like the answers to both of these questions is "no," but it is not clear what we should do about that.

Lacunae in knowledge always necessitate a reliance on opinion, and there is nothing inherently unethical or unscientific about making value judgments in interpreting contested

scientific *claims*. But allowing the gender composition of the judiciary to decide between competing systems of scientific *values*—the value systems according to which ambiguous neurobiological testimony is interpreted—is both unscientific and unfair.

4.2. Alternative Explanations & Future Directions

Recall that the experiment conducted by Aspinwall et al. was designed to test the judges' decision-making in the context of the "double-edged sword" (2012). It was not designed to test for gender differences within the judiciary, or to study the kinds of considerations that actually mediated the sentences and written opinions that judges provided. Thus, there remain several unanswered questions about the mechanisms by which neurobiological testimony interacts with gender in determining judicial sentencing of criminal psychopaths. These questions suggest several directions for future research.

One possible source of disagreement may have been the relative scientific merit of the testimony judges read. But it is also possible that gender differences arose over the perceived relationship between psychopathy and punitive desert. Or, these differences could have arisen over theory of punishment, that is, how to weigh concerns about giving the criminal the punishment he deserves against concerns about the consequences of his potential release on community safety.

These are just some of the questions that the present analysis must leave unanswered. And in fact, more than one of the factors just listed could have contributed to the discovered gender differences. They are not mutually exclusive. Additionally, it is worth noting that the limited experimental sample of female judges leaves open the possibility of a small but undetected effect of biomechanism on the sentences they assigned. Still, the results imply that

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the appropriate treatment of neuroscience evidence in the courtroom does not just depend on the consequences of its admission, but also on the consequences of its inadvertent omission and its deliberate exclusion. This means that we cannot wait until neuroscience advances before we address potential biases in neuroethical policy.

Decisions about the admissibility of this kind of neuroscience testimony are already being made (Forzano *et al*., 2010). To the extent that these decisions might increase reliance on inegalitarian values, their biasing effects must be adjudicated now. But how?

5. Conclusions

Changing the way trials are conducted would only provide a superficial solution to the problems identified in this paper. Moreover, more permissive attitudes toward neuroscientific testimony do not necessarily seem warranted, given our current paucity of understanding of the connection between the brain, behavior, and morality. There are deep, worrisome issues with the present distribution of attitudes toward—and the genderization of— neuroscience. The purpose of this paper has been to show how these issues are seeping into the criminal justice system. The long-term solution to this problem is not to adjust the justice system to accommodate gender differences in attitudes toward psychiatry and neurobiology. The solution is to study these differences, and to address their causes within our society.

Not only is this, descriptively, the only way to actually resolve the problem in the long-run, but it is also, normatively, the required solution, since introducing false or unverified testimony, or imposing preordained values, are not morally acceptable options. The first step in addressing the potential over-representation of a hard-scientific bias among male judges is to raise awareness of the issue. I consider the publication of this essay only to be a first step toward

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raising this awareness. I consider further steps, including follow-up studies and wider dissemination of this information to the public or at least to the judiciary and policymakers, to be necessary as well.

In deciding how to act on this knowledge, it may be essential to recognize that despite its merits, the *principle of epistemic caution* might itself need to be applied with caution. This is especially true in cases that are entangled with issues of social justice, such as gender inequality on the bench. Moving forward, it may also prove invaluable to study the psychological and sociological factors that underwrite these gender differences in judicial opinion, and gender differences in public attitudes toward science more generally. Doing so might help us not only to identify and remedy their effects on judicial sentencing, but also to understand and address the social forces that give rise to these gender differences in the first place.

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