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Lady Justice may be Blind, but is She Racist? Examining Brains, Biases, and Behaviors Using Neuro-Voir Dire

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Abstract

This paper discusses the possible use of functional magnetic-resonance imaging as potentially useful in jury selection. The author suggests that neuro-voir could provide greater impartiality of trials than the standard voir, while also preserving existing privacy protections for jurors. He predicts that ability to image and understand a wide range of brain activities, most notably bias-apprehension and lie detection, will render neuro-voir *dire* invaluable. However currently, such neuro-solutions remain preliminary.

Keywords: fMRI; neuroimaging; jury selection; jury bias; neuro-voir *dire*

“The one place where a man ought to get a square deal is in a courtroom, be he any color of the rainbow, but people have a way of carrying their resentments right into a jury box.”¹

—Atticus Finch, *To Kill a Mockingbird*

“[T]rials are too important to be left up to juries.”²

—Rankin Fitch, *The Runaway Jury*

Racial discrimination in the U.S. judiciary is all too familiar by now. And much as we might wish that such events unfolding were restricted to fiction—as in Harper Collins’ *To Kill A Mockingbird*³ or Sidney Lumet’s *12 Angry Men*⁴—we need not extend our memories beyond the O.J. Simpson or George Zimmerman trials to see why, unfortunately, such imaginative power is unnecessary. Mock juror studies have shown that racial bias regularly affects both verdicts and sentencing; and social cognition research has evidenced over 80% of non-Black Americans demonstrating implicit anti-Black biases.⁵ And racism is not the only form of bias placating fair judicial processes. The Bill Cosby trial had several “false starts” before finding a trial location with jurors who had not been over(t)ly influenced by the “#metoo” movement. Yet despite this, jurors in their deliberations still largely operate within a black box of secrecy that reflects not only the privacy of the deliberations within the jury room, but also the inaccessibility of the minds of the jurors themselves.

Jamie Ward, a prominent neuroscientist, famously quipped, “If George Orwell had written [1984] during our times, would he have put an MRI in the Ministry of Truth?”⁶ But the use of functional magnetic-resonance imaging (fMRI) to read minds is not just a matter for fiction-writers or futurologists; it has growing precedence in the courtroom.⁷ However, neuroscientific evidence has only ever been introduced with regards to plaintiffs, defendants, and witnesses; and medico-ethico-legal analyses have followed suit. What is novel, and potentially useful, is neuroimaging jurors during *voir dire*.

Henry Greely coined the term “neuro-voir *dire*” in 2009 during an early forecast of the now-bubbling field of “neurolaw.”⁸ But very little credence has been lent to this speculative solution.⁹ Interestingly,

neuro-*voir dire* is promising to resolve racial biases and several other issues for which existing methods falter. This paper discusses the standard *voir dire* process in the United States and its shortcomings, the state of (neuro)science (viz. neuroimaging) to vindicate the purpose of this process, how neuro-*voir dire* may mitigate some of the issues that arise from recent judiciary *post-hoc* solutions, and several areas of concern when neuroimaging jurors.

Voir dire is the process of de-selecting potential jurors because of their perceived or expressed biases at the outset of a case. It is the primary method for defendants, plaintiffs, (their) lawyers, and courts to explore together what they believe to be salient biases affecting the potential for an impartial trial, which is guaranteed to all U.S. citizens by the Sixth Amendment.¹⁰ Done well, it permits a smooth, honest, and impartial trial, diminishing the possibility of an erroneous verdict and/or discovering a “bias problem” that existed “all along.” Rather than *post-hoc* cures, *voir dire* aims at “closed-crack” preventions.

However, jury selection is rarely done well (and, discussed below, may be why the U.S. Supreme Court has recently focused on post-trial remedies rather than sticking to precedent and strongly advocating for improvements to the failing *voir dire* process). For one, although the *voir dire* process is intended to vindicate impartial juries, both defendants and plaintiffs may, in fact, *seek* biases in their favor by manipulating jury selection—recall the gun lobby’s expressed favor for “fat women,” ex-marines, and Republicans when “stacking” the jury in John Grisham’s illustration of *voir dire* gone dreadfully wrong in *The Runaway Jury*.¹¹ Such cases of stacking are not only difficult to uncover, but are, in fact, somewhat permissible (as distinct from “jury tampering”), since ‘attractive’ characteristics indicative of a juror’s inclination toward a certain verdict are not evidence of bias in and of themselves.

However, whether or not such characteristics are indeed indicative is specious, as well as challenging. Even when well-intentioned (i.e., to ascertain evidenced bias), trying to understand the beliefs, attitudes, and behaviors of another person through roundabout observation and question-and-answer methods is incredibly difficult. Recall the scene in Rob Reiner’s cult-classic *The Princess Bride* in which Vizzini (the villain) must deduce in which goblet of wine Westley (the hero) placed a lethal poison to win back Princess Buttercup in the “Battle of Wits”:¹²

VIZZINI: But it’s so simple. All I have to do is divine from what I know of you. Are you the sort of man who would put the poison into his own goblet, or his enemy’s? Now, a clever man would put the poison into his own goblet, because he would know that only a great fool would reach for what he was given. I’m not a great fool, so I can clearly not choose the wine in front of you. But you must have known I was not a great fool; you would have counted on it, so I can clearly not choose the wine in front of me.

WESTLEY: You’ve made your decision then?

VIZZINI: Not remotely. Because [the poison] comes from Australia... And Australia is entirely peopled with criminals. And criminals are used to having people not trust them, as you are not trusted by me. So I can clearly not choose the wine in front of you... You must have suspected I would have known the powder’s origin, so I can clearly not choose the wine in front of me... You’ve also bested my Spaniard which means you must have studied. And in studying, you must have learned that man is mortal so you would have put the poison as far from yourself as possible, so I can clearly not choose the wine in front of me.

WESTLEY: You’re trying to trick me into giving away something—it will not work.

VIZZINI: It has worked—you have given everything away—I know where the poison is.

But Vizzini fails to read Westley’s mind, drinks the poison, and dies. He used the same “folk psychology” (just as confidently yet far more dramatically) employed in *voir dire* that relies on interpretation of facial expressions, tones of voice, and body language to know what and how a person thinks, believes, and behaves. Not only do such methods not work for explicating explicit biases,¹³ but also they completely miss the mark in ascertaining implicit biases—micro-level prejudices increasingly recognized to exist in everyone to varying degrees. Even “scientifically-based” bias-assessment tools like

the “Implicit Association Test” (IAT) have been shown to be unreliable when examining juror biases.^{14,15} And the consequences for Vizzini are no graver than for the defendants sentenced to life-imprisonment or death following a biased verdict resulting from failed *voir dire*.

What is more, Westley lied (having put the poison in both goblets knowing he was immune). Likewise, jurors lie for a host of reasons during *voir dire*—including the desire to affect the outcome of a case they have an interest in, avoid revealing unpopular views in front of strangers, or even to answer in a way they anticipate will meet with the judge’s approval—and they do it frequently.^{16,17} Such standard *voir dire* methods are so poor that some have called for an end to peremptory challenges (i.e., de-selecting potential jurors without formal discussion of causative reasons) altogether.^{18,19}

Neuro-*voir dire* potentiates using recent and forthcoming advances in neuropsychiatric research and neuroimaging to improve a failing *voir dire* by removing as much human subjectivity from a process endeavoring to champion objectivity. Would Westley’s limbic system have shown increased activity just before drinking the poison, revealing a lack of fear response? More poignantly, could a racist juror’s amygdala reveal fear or anger when shown pictures of blacks or Hispanics; or reveal a sexist bias when images of women are displayed? Social neuroscience research has undertaken identifying various regions of the brain and levels of activity with regards to bias.²⁰ Aligning with the Supreme Court (per *Peña-Rodriguez v. Colorado* below), most such research has focused on racial biases—typically, subjects are shown rapidly changing images of people with different skin tones while undergoing fMRI. Although neuroimaging is still yet to reveal different bias-contents (e.g., race vs. gender vs. political party), it can identify when *both* explicit and implicit biases are present.²¹ Such improvement over standard *voir dire* is not just conceptual: empiric evidence from “mock juror” studies reveal fMRI is significantly better than psychological or behavioral measures, including IAT.²² What is more, when mock jurors were presented with employment discrimination cases, fMRI was able to correlate neural activity, verdict, and even award size.²³

Even if an fMRI would have been unfruitful in identifying Nick Easter’s explicit anti-gun bias in *The Runaway Jury*, the court may have benefitted from its use during normal interrogation of his ardent anti-gun beliefs: would an impartial trial still have ensued had his lying been exposed when answering questions while undergoing fMRI? Could a racist juror lie when submitted to neuroimaging during explicit questioning about their xenophobic attitude? Much research exploring the use of fMRI (and other neurotechnologies) for lie detection is underway.^{24,25,26} Evidence has been so promising that several companies are now selling fMRI-based lie detection and analysis of results.²⁷ And while such lie detection methods remain preliminary, this has not stopped its attempted use in deposing those who occupy the witness stand,^{28,29} so why not those who will sit in the jury box? Neuroimaging tools may, at the very least (until and when neuroimaging for biases is adequately developed), provide more accurate appraisals of the validity of potential jurors’ answers. By circumventing potential dishonesty during *voir dire*, robust and honest deliberation of evidence and law can ensue in chambers. If a juror cannot fool the Court in the trial room, they probably will not act like one in the jury chambers.

There are a myriad of other potential benefits from neuro-*voir dire*. The Sixth Amendment and Federal Rule 606(b) are not solely concerned with impartial jurors, but also arbitrary decisionmaking.³⁰ Cognitive neuroimaging could, for example, help determine whether a potential juror is able to use logical reasoning (or lacks capacity).³¹ It could measure the extent to which a juror will be able to pay attention throughout an anticipatorily lengthy trial.³²

Interestingly, neuro-*voir dire* may help vindicate the “subjective ideal” of the jury through more direct methods than previously proposed solutions.³³ Whereas the “objective ideal” has historically been the dominating doctrine of juror selection “free from any bias” whatsoever,³⁴ the subjective ideal recognizes that diversity (in both brain and body) and subjectivity (in some aspects) are important components of judicious juries; and legal scholarship, with the aid of neuroscientific research, has become increasingly able to appreciate the ability to champion this ideal.³⁵ By bringing a group of a people with diverse attitudes, perspectives, and experiences, fair verdicts may be generated within the context of the community in which they are rendered. This is, in part, why potential jurors are drawn from the district in which the trial is being held—because community norms differ between Georgia and Massachusetts,

and juries in Los Angeles can benefit from the perspectives of those from both Beverly Hills and Compton. This is not merely conceptual, but has been laid down by several judicial decisions: in the case of *State v. Briggs*, the court recognized that “a jury, in exercising its collective wisdom, is expected to bring its opinions, insights, common sense, and everyday life experience into deliberations”;³⁶ in the case of *Peters v. Kiff*, the judiciary stressed that the thrust of federal law disallowing a potential juror to be struck (i.e., dismissed from jury duty) based on race or gender³⁷ is that doing so “deprives the jury of a perspective on human events that may have unsuspected importance in any case that may be presented.”³⁸ *Neuro-voir dire* has the potential to go beyond passive permission despite juror differences, and rather to actively select jurors *because* of different beliefs, perspectives, and experiences that would constitute a diverse, pluralist, and fair jury.

In addition to augmenting current method(s) of *voir dire*, *neuro-voir dire* could resolve many of the issues arising from recent, significant changes to jury practices. Uncovering racial (and other) discrimination present in jury deliberations (once a trial has ensued), and what to do once discovered, has always been legally problematic. Federal Rule 606(b), known as the “no-impeachment rule,” forbids jurors from testifying “about any statement made or incident that occurred during the jury’s deliberations.”³⁹ 606 (b) has withstood legal challenges on the basis of juror misconduct time and time again with few exceptions,^{40,41,42} primarily because preserving the black box enshrouding the secrecy of jury deliberations permits full and forthright debate among a wide range of views, and shields the jury from extraneous influences—it authenticates the Constitutional guarantee of a “public trial, by an impartial jury...”⁴³ Unaccountability has been called the “hallmark of the American jury”⁴⁴ because the justness of the jury’s verdict stems from its emphasis on legitimate conversation. But unaccountability also means that discriminatory verdicts can be reached via racial and other biases.

The U.S. Supreme Court sought to change this in *Peña-Rodriguez v. Colorado*.⁴⁵ Miguel Angel Peña-Rodriguez underwent trial for the sexual assault of two young girls in 2010.⁴⁶ Following Peña-Rodriguez’s conviction, two jurors told the defense lawyer that a fellow juror—a police officer—“said that where he used to patrol, 9 times out of 10 Mexican men were guilty of being aggressive toward women and young girls” and “he did not think the alibi witness was credible because, among other things, he was ‘an illegal’.”⁴⁷ Peña-Rodriguez’s lawyer moved for a mistrial, believing such ethnically prejudicial remarks had affected the jury’s verdict, which was denied by the trial judge and higher Colorado courts on the basis of 606(b). Peña-Rodriguez’s appeal reached the Supreme Court, resulting in the first major reform to jury practices ever to explicitly address racial biases.

Justice Anthony Kennedy, writing for the majority, held that the secrecy of jury deliberations does not extend to racial biases of jurors that sufficiently affect a verdict. The Court’s holding amends 606(b) by demanding States apply thresholds for “showing that one or more jurors made statements exhibiting overt racial bias that... [were] a significant motivating factor in the juror’s vote to convict” and create “practical mechanics of acquiring and presenting such evidence.”⁴⁸ Justice Samuel Alito, writing in dissent, acknowledged the “safe-space” for racial discrimination within jury chambers as “a flaw in the jury trial system,”⁴⁹ yet asserted that the Court’s decision makes perfect the enemy of great.

Although the Supreme Court’s effort to expunge racial discrimination from the United States’ (judicial) future by nodding its head from its past is laudable, it raised several issues. The Supreme Court has now officially sanctified “racial bias [in its] unique historical, constitutional and institutional concerns.”⁵⁰ In other words, biases are not only separate, but unequal. This flies in the face of overwhelming precedent that “any influence”⁵¹ is unacceptable under the Sixth Amendment’s doctrine of a “wholesale exclusion of bias”—that is the objective ideal.⁵² What is more concerning than acknowledging that Lady Justice may have been peering through her blindfold (at skin tone) for some time is that the Supreme Court has possibly (yet inexplicitly) lifted it for her (with regards to other biases). Justice Alito emphasized that “the real thrust of the majority opinion is that the Constitution is less tolerant of racial bias than other forms of juror misconduct...”⁵³ It is curious that, in relying on the Sixth Amendment and not the Equal Protections clause of the Fourteenth Amendment, the Court relinquished an opportunity to acknowledge and purge other nefarious biases, including those concerning gender, sexual orientation, and/or national origin. The black box of jury deliberation apparently only comes in one color.

The decision also raised juror privacy concerns that 606(b) had previously mitigated. By generating post-trial mechanisms for addressing racism, *Peña-Rodriguez* opened the possibility of (post-trial) juror harassment by those who wish to know why a verdict turns out the way it does. Furthermore, it discourages honest deliberation amongst jurors who fear judgement by their peers and know that what they say may be later leveled against them. By exposing the content of jury deliberations, *Peña-Rodriguez* may paradoxically encourage jurors to hide their previously “overt” racial biases, yet render the same racist decision—what is known as the “chilling effect.”

Overall, prior to *Peña-Rodriguez*, this is why the courts have historically (and should continue to) relied on *voir dire* to formulate impartiality. Pretrial mechanisms do better to avoid issues of juror exposure and constrained conversation, as well as mitigate *ex ante* increases in post-trial investigations, appellate reviews, and re-trials that will burden the efficiency of an already overwhelmed judicial system. Neuro-*voir dire* preserves and enhances such benefits as discussed above; however, employing advanced neuroimaging in *voir dire* is not without several concerns of its own.

Practically, fMRI machines are large, and analyzing results is expensive. However, even its most vocal objector has acknowledged this reason is insufficient as neurotechnology becomes more accessible.⁵⁴ Legally, the jury is still out on the admissibility of neuroscientific evidence in the courtroom. Courts are unsure to what degree such evidence would actually be useful or hesitant that it could sway juries themselves.⁵⁵ However, its admissibility for the purposes of *voir dire* have yet to be addressed.

More significant concerns include juror privacy and the implications for the judicial system based on what kind of conclusions regarding bias neuroimaging can draw. Although neuro-*voir dire* may withstand the privacy issues raised by loosening the no-impeachment rule in *Peña-Rodriguez*, it potentially poses distinct privacy challenges in two, primary ways. First one must question whether the autonomy of individual jurors is, in some way, violated by generating a system in which they must report for jury duty and are obligated to undergo neuroimaging as part of the process. Should jurors who refuse be held in contempt? In this regard, it does not seem that neuro-*voir dire* differs from standard *voir dire* practice—why are jurors currently unable to refuse to answer (salient) questions about themselves, including their deeply held beliefs? The courts have held that jurors’ biases are not protected by the First Amendment’s guarantee to “freedom of speech”⁵⁶ or Fifth Amendment’s protection against “self-incrimination.”⁵⁷ The judiciary has held that jurors’ privacy rights are subservient to the trial parties’ right to an impartial jury—primarily because the consequences for the defendant, particularly in criminal cases,⁵⁸ take precedent over the consequences of exposing information a juror did not want known, that is being dismissed from the jury. Moreover, the courts are still unclear whether mind data derived from neuroimaging constitutes testimonial or material evidence, the latter of which is entirely unprotected as evidence for bias.⁵⁹

However, and second, neuroimaging in the course of neuro-*voir dire* can reveal more than relevant biases to involved legal parties and the court. For example, should an MRI show a juror has a brain tumor within the frontal lobe—the area of the brain responsible for decisionmaking and integrated reasoning—should the juror be notified of such incidental findings? If the juror exhibits no clinical evidence of impaired decisionmaking, should they still be allowed to serve? Relatedly, how would a juror react to learning they have an (implicit) bias that they were unaware of? For example, how would a juror respond should they discover they have a racial bias significant enough to dismiss them from jury duty, yet neither they nor those who know them were cognizant of their racist tendencies? Although there exist no definitive legal or ethical answers to these questions, I offer four recommendations for addressing these issues of privacy and autonomy that may arise from the implementation of neuro-*voir dire*. First, neuroimaging should only be used to ascertain *relevant* details about the brain for the purposes of jury selection. Second, incidental findings should only be reported (and potential jurors referred to a physician specialist) should clinical symptoms be present, pursuant to standard medical practice. Third, neuroimaging findings should be appreciated along with (not exclusive of) standard question-and-answer methods—a neuroimaging specialist should appraise the validity, significance, and noise accompanying findings. Fourth, neuroimaging should be performed and results presented solely before the individual juror, judge, and litigators (i.e., *in camera*), avoiding violations of privacy by revealing

potentially sensitive information to the gallery and other jurors. In addition, results should be explained to the individual juror in context.

Neuro-*voir dire* may also have significant implications for the judicial system, namely the overarching *telos* of an impartial jury and the *modi operandi* in selecting jurors to achieve this purpose. First, the current inability of fMRI to fully differentiate different *bias-types* (e.g., explicit vs. implicit biases) and *bias-contents* slices both ways. On the one hand, a simple bias/no-bias result may vindicate the historic emphasis on the objective ideal of an impartial jury. This approach, unlike *Peña-Rodriguez*, need not place racial bias on a pedestal, but could finally rid juries of all (heinous) discriminations. It would not rely on jurors to identify impeachable racial biases (and ignore nonracial ones), and preserves trust amongst them. Neuroimaging may further explicate implicit biases of which the juror is unaware—biases that could not be otherwise brought forth through less restrictive means. On the other hand, all people retain some amount of (implicit) bias. Grouping all kinds and degrees of bias together into a dichotomous output would further solidify the monolithic conception of an impartial jury that the subjective ideal seeks to combat,⁶⁰ as well as exclude a large proportion (if not all) of the population who cannot achieve Vulcan-like judgment from being able to participate on juries.

Therefore, as Dov Fox has opined,⁶¹ the judiciary (and legislature) may need to update the current *ethos* of “impartial” juries (or re-conceptualize it with an improved understanding of human biases and greater emphasis on the subjective ideal). Although such changes may open the proverbial Pandora’s box to “acceptable” and “unacceptable” biases being exhibited by jurors (and I am skeptical of the precise such distinctions Fox draws), neuro-*voir dire* may interestingly have a solution to this matter. If the judiciary can establish a quantitative threshold for a degree of bias uncovered by neuroimaging, coupled with established scientific thresholds of accuracy, relevance, and “noise,” potential jurors need not be excluded merely because they are not “blank slates” (i.e., unhuman), but rather because their relevant explicit and implicit biases are sufficiently strong to demerit their inclusion. This should further show that although the state of neuroscience is not presently advanced enough to be used for neuroimaging in *voir dire*, neuro-*voir dire* may not remain theoretical should its constituting neuroscience be developed in the context of and along with its potential use in the courtroom.

The Supreme Court’s formal recognition of the history and pervasiveness of racial bias within the judicial system in *Peña-Rodriguez* is commendable. However, neuro-*voir dire* provides more reasonable, accurate, and far-reaching solutions fitting within precedent. It promises to vindicate the impartiality of trials better than standard *voir dire*, while better preserving existing privacy protections for jurors. The ability to image and understand a wide range of brain activities, most notably bias-apprehension and lie-detection, will render neuro-*voir dire* invaluable. But since such work is still preliminary, neuro-solutions require neuro-modesty.

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