

Cognitive Bias in the Judiciary: The Role of Cognitive Enhancement

Giovana Lopes¹

¹ University of Bologna, Via Galliera 3, Bologna, Italy
KU Leuven, Sint-Michielsstraat 6, Leuven, Belgium
<https://orcid.org/0000-0003-4798-2542>

Abstract. Evidence shows that judges are prone to the same cognitive biases as the general population when it comes to making their everyday decisions, such as anchoring, contrast and compromise effect, ingroup favoring and racial bias. Given the high stakes involved in judicial decision-making not only for the parties directly affected but for society in general, the question of improving the quality of those decisions through debiasing methods is important. Judicial review, workload reduction, adequate legal education and training are some of the methods commonly pointed out to reach that goal. Judicial decision-making involves multiple tasks, each of which use various cognitive processes to different degrees. Enhancing judges' cognitive abilities through the use of neurotechnologies could also, thus, serve the purpose of improving the quality of judicial outcomes. In this context, this paper aims at exploring the continuum of conventional and new methods of cognition enhancement, evaluating their efficacy and disadvantages, as well as their moral permissibility to be deployed in the judicial context.

Keywords: Cognitive Bias, Cognitive Enhancement, Legal Reasoning.

1 Introduction

More often than not, legal reasoning and judicial decision-making is viewed as being the product of purely rational human beings whose choices are always informed and consciously made. This idea is partially correct, being in line with deliberative processes, which are mental operations requiring effort, motivation, concentration, and the execution of learned rules. Associated with controlled processes, this way of thinking is deliberate, rule-governed, effortful, and slow (when compared to other mental processes that occur under the surface of consciousness).

But conscious deliberation is only one side of the story. Empirical observations and experiments suggest that our decisions are frequently intuitive and driven by emotion. In sum, intuitive thinking is an unconscious process (i.e., carried beyond our conscious control); fast, in contrast to slow, conscious deliberation; automatic, as a mental process that occurs spontaneously and cannot be controlled intentionally; and based on previous existing knowledge, being thus based on experienced, and possibly shaped by training

(intuitive responses can emerge from repetition of the same deliberative procedure, becoming automatic through prolonged practice).

Being automatic, quick, and easily invoked, intuition can easily dominate deliberation, and these characteristics that define this rapid processing sometimes come at a cost: systematic errors that predictably recur in particular circumstances – the so-called cognitive biases. In the context of judicial decision-making, intuitive thinking is more likely than deliberation to lead judges astray, and litigants might be adversely affected by judicial overreliance on intuition.

This represents a paradox, because judges are expected to remain entirely neutral while doing their jobs, a near-impossible task for human beings, who are all prone to implicit biases. In the last decade, considerable effort has been devoted to investigating intuitive decision-making in law, and specifically how it influences the outcome of judicial proceedings.

This work aims at reviewing how implicit biases work in the context of the judiciary, negatively influencing judicial decision-making. In light of this, and adopting as theoretical framework Macello Ienca's cognitive enhancement continuum, possible debiasing methods will be assessed, ranging from a spectrum of traditional techniques (e.g., training and peer-reviewed feedback, opinion writing, mindfulness meditation) to neuroenhancements (e.g., nootropics, noninvasive brain stimulation). The goal is to assess the effectiveness of current existing methods, as well as foreseeable uses, advantages, and risks, thus providing pointers for future research on the topic. Methodologically speaking, this work is essentially theoretical and bibliographic, drawing on direct and indirect sources for a comprehensive review of the theme. Judiciary aspects of both common and civil law will be assessed, without, however, focusing on any specific national legal system.

2 Cognitive Biases in the Judiciary

There is no short of studies and experiments demonstrating the different ways in which humans (and judges specifically) fall prey to different cognitive bias when it comes to making judgments.

One of them is the anchoring effect, which refers to an excessive reliance on numeric reference points when making numeric judgments. In many situations, people make estimates by starting from an initial value (called an "anchor") that is adjusted to yield the final answer. Such adjustments are typically insufficient – different starting points yield different estimates, which are biased towards the initial value, i.e., the anchor [1]. The judicial system is full of circumstances under which uncertain evaluations need to be reduced to a quantitative judgment: the judge's or jury's determination of damages in civil cases, the determination of the reasonableness of costs and attorney fees to be awarded to a successful litigant, and, most significantly, criminal sentencing [2].

In a study conducted by Guthrie, Rachlisnki and Wistrich [3], a group of judges were presented with the case of a plaintiff who had been hit by a truck belonging to the defendant, due to faulty brakes, causing the plaintiff to be hospitalized for months and ending up in a wheelchair. The judges in the experiment were divided into two groups

and asked to determine the amount of compensation due to the plaintiff. The first group received just the above description of the facts, while the second one also received complementary information that the defendant had requested the claim to be rejected on the allegation that the plaintiff's damages did not exceed \$75,000 and should thus have the case be considered by a lower court.

Adding this number to the information worked as an anchor and had a significant effect on the average amount of damages awarded by the participants in the experiment: while the first group awarded an average amount of \$1,249,000, the second one awarded an average of \$882,000, being apparently anchored by the number present in the information that was presented to them [4].

Anchors create powerful intuitions even when the numbers are meaningless. In another study, judges read a criminal scenario and were asked to impose a hypothetical sentence, and simply rolling a die primed with just the numbers 3 and 9 on it was enough to anchor the participants: those who rolled a 3 imposed an average sentence of 5 months, while those who rolled a 9, an average sentence of 8 months [5].

Another intuitive process that can also affect the legal profession is the representativeness heuristic, which results in the tendency to undervalue statistical information, leading to decision errors such as base rate neglect (i.e., discounting information about the frequency with which the underlying category occurs) and insensitivity to sample size [6]. In one study, lawyers were asked to evaluate what they thought would be the chances of a case ending in a court sentence, dismissal, settlement, etc. One of the options was an outcome other than a judicial verdict – an option that includes all the previous ones together. However, the respondents estimated that the probability of a settlement was higher than that of the case ending in an outcome that was not a judicial verdict [7].

When deciding between two options, adding a third one might make people switch to it, even though it should not, as a matter of pure logic, change their preferences as between the original two. If the third option falls between the other two in quality, this phenomenon is called a compromise effect; if it is inferior or superior to the original ones, it is referred to as a contrast effect [8].

In an experiment conducted by Kelman, Rottenstreich and Tversky [9], nonjudge subjects were given a homicide scenario and asked to pick between different levels of murder. When deciding between only two options – manslaughter and murder – 47% chose the first one and 53% the latter. However, adding a more serious option to the case – murder with aggravating circumstances -, only 19% chose manslaughter, 39% chose murder and 42% chose murder with aggravating circumstances.

Observational literature about this phenomenon in real criminal and civil cases shows that jurors frequently compromise when given the opportunity to do so [10]. And in a study conducted by Leibovitch [11] with actual judges, it was found that Pennsylvania state criminal judges regularly exposed to lower-gravity crimes sentenced more harshly than those who were frequently exposed to higher-gravity ones. To Hoffman [12], this perhaps argues in favor of a robust rotational system where judges do not sit hearing the same kinds of cases for too long, and specifically against those jurisdictions (such as Philadelphia) that have judges who try nothing but murder cases.

Of particular relevance are studies that show that judges are prone to ingroup favoritism, racial and gender biases. When it comes to the first one, evidence suggests that even meaningless distinctions between people are enough to promote it. Research by Wistrich, Guthrie and Rachlinski [13] testing this influence on judges resulted in their expression of a large in-state bias.

In a hypothetical scenario of wrongful death, judges award more in compensatory damages for lost wages for a deceased male than a deceased female; treat male and female parents differently in divorce cases; and impose shorter sentences on female than male defendants with identical backgrounds, convicted of identical crimes [14]. There is also evidence suggesting that judges treat white and black litigants differently in bail hearings [15]; exhibit modest racial disparities in criminal sentences favoring defendants of their own race [16]; impose harsher sentences on dark-skinned defendants [17]; and are more likely to deviate favorably from sentencing guidelines for white than for black defendants [18].

Judges also face other sources of potentially misleading intuitions when deciding cases, amongst which the influence of inadmissible evidence. Contrary to jury, judges cannot shield themselves from inadmissible evidence. Relevant but inadmissible evidence can create an intuitive sense of how a case should be resolved, and that intuitive sense likely influences how judges decide [19].

In a series of studies that compared decisions in hypothetical cases made by judges who were exposed to inadmissible information and by those who were not, judges found it difficult to ignore inadmissible information, relying on it to decide on the cases presented [20].

Other studies have found a similar inability to disregard inadmissible evidence in contexts such as discussions protected by attorney-client privilege; the past criminal conviction of a civil defendant; discussions that occurred during a settlement conference; and statements made by a criminal defendant that a prosecutor had agreed not to use as part of a plea agreement [21]. Interestingly, the one area in which judges clearly ignored inadmissible evidence was in making probable cause determinations. Being an area of law that requires judges to focus on the relevant precedent, engaging in a deliberative analysis, they were nudged to look beyond their intuitive reactions [22].

3 Fighting Judicial Bias

According to the Bangalore Principles of Judicial Conduct [23], when it comes to the knowledge, skills, and personal qualities necessary for the proper performance of judicial duties, it is stated that judges must perform their roles without favor, bias or prejudice. The Code of Conduct for United States Judges [24], the Recommendation CM/Rec (2010)12 of the European Union [25] and others have similar provisions regarding duties of impartiality.

They treat, however, the problem of bias from a conscious perspective, requiring that judges take steps for dealing with the biases that they are aware of. But many people either have not heard of the concept of implicit biases or mistakenly conflate it with

overt prejudice. This ignorance extends to the judiciary, with many judges being unaware of implicit biases and remaining unwittingly subject to their own [26].

When it comes to improving the quality of judicial decision-making, some factors such as adequate legal education, experience, and a good mental and physical state (e.g., adequate rest, nutrition, health), are obvious candidates for the task [27]. Judicial review and auditing, the adoption of scripts, checklists, and multifactor testes, training and peer-reviewed feedback, opinion writing, reduced workload and even mindfulness meditation have also been suggested [28].

For instance, Wistrich and Rachlinski [29] suggest that justice systems could implement auditing programs to evaluate the decisions of individual judges and to determine whether they appear to be influenced by implicit bias, since the current institutional context provides judges with little useful feedback. Another proposed method is perspective taking, a method adopted in social context education initiatives, which seek to promote fairness and equality within demographically diverse societies by ensuring that judges are aware of and understand the experiences of all of those who may come before them [30].

Also, evidence suggests that mindfulness meditation can help judges limit their reliance on automatic reactions and helps control the conditions that increase the magnitude of implicit bias, such as mood. Mindfulness also targets implicit bias by reducing automatic associations with outgroup members, or with individuals outside of the race or ethnicity one identifies as, with negative concepts. For instance, a study revealed that after exposure to an audiotape giving listeners mindful instructions (i.e., to be aware of their current thoughts and feelings), white participants' implicit association tests (also known as "IATs", commonly used to measure implicit bias) showed a significant reduction of bias against African Americans, attributable at least in part to reduced automatic associations [31].

These reforms tend to make decision-making more costly and/or time consuming, and some of them might be sufficiently cumbersome that they do not justify the extra costs imposed on litigants and the justice system [32]. Some techniques reduce (but never fully eliminate) some kinds of cognitive biases, and others don't seem to have any effect, or even make things worse [33]. For instance, experiments have shown that anchoring is very difficult to overcome, even when subjects are forewarned about it or are incentivized against it [34], even so when the anchor itself is patently incorrect [35] or known to be random [36].

Scholars have also suggested that reducing unconscious biases could be achieved by exposing decision makers to stereotype-incongruent models – however, evidence concerning the effectiveness of this technique is mixed. Results achieved by Wistrich and Rachlinski on the IAT reveal that white judges' exposure to a group of esteemed black colleagues wasn't enough to counteract the social influences that produce implicit negative associations regarding African Americans. Besides, consciously attempting to change implicit associations is difficult for judges, who have little control over their dockets, which tend to include an over-representation of black criminal defendants [37]. Being explicit about implicit bias, although helpful, is not enough to overcome their occurrence, since the factors that cause it are not always under the individual's control.

4 Cognitive Enhancement

All of the previously mentioned methods may be labeled as conventional means of enhancing cognition, which are often well established and culturally accepted. Cognitive enhancement may be defined as the amplification or extension of core capacities of the mind, through augmentation or improvement of a person's information processing systems, which can be directed at any of the core faculties of the mind [38], such as attention, perception, and memory.

Cognition enhancement can also be pursued through nootropics and noninvasive brain stimulation. The first refers to the set of pharmaceutical drugs, supplements, nutraceuticals, and functional foods that improve processes such as attention, memory, concentration, intelligence, motivation, perception, and decision-making [39]. They usually work by: (i) altering the availability of the brain's supply of neurochemicals; (ii) stimulating nerve growth; and (iii) increasing the brain's oxygen supply [40].

For instance, donepezil, an acetylcholinesterase inhibitor indicated for mild to moderate Alzheimer's disease, appears to enhance different types of memory, with both acute and repeated administration. The stimulant methylphenidate, usually prescribed to treat attention deficit hyperactivity disorder (ADHD), shows cognition-enhancing effects relating to memory, specifically spatial working memory, and recognition of verbal materials at longer test intervals. For amphetamine, there is stronger evidence for enhancement of the consolidation of declarative memory, especially when longer periods intervene between learning and testing. With modafinil, a wake-promoting agent for the treatment of excessive daytime sleepiness associated with narcolepsy and other disorders, a clear enhancing effect is found on attention in non-sleep deprived subjects, while in sleep-deprived participants, a single dose of modafinil had strong positive effects on executive functioning, memory, and wakefulness [41]. Finally, propranolol, a beta-blocker commonly prescribed for hypertension, has been found in a study by Terbeck et al. to reduce implicit racial bias [42].

In its turn, noninvasive brain stimulation (NBS), like transcranial magnetic stimulation (TMS) or transcranial electrical stimulation (tES) – the most common being transcranial direct current stimulation (tDCS), has also been found to improve various cognitive functions. For instance, TMS has been proven to improve analogic reasoning and working memory [43], and to reduce false memories without affecting veridical memories [44]. There are also noteworthy applications of tDCS involving manipulation of executive functions, which include enhancement in domains such as cognitive set-shifting performance [45] and deceptive behavior [46].

Sowden et al. were able to demonstrate that tDCS applied to the right temporo-parietal junction improved lie-detection performance when participants were confronted with statements in which the to-be-judged opinions conflicted with those held by the participants [47], and in a study by Sellaro et al., participants who received tDCS showed increased cognitive control over stereotypes activation with a resulting reduced implicit negative bias towards a social out-group [48].

In sum, these interventions serve the purpose of activating deliberative mental processes. By ameliorating the decision-making abilities necessary for judges to perform their work, they can reduce biases and help move towards the idealized, rational model

of legal reasoning. There are, however, valid safety concerns associated with it, especially since there is still no research about their long-term effects of usage in healthy individuals [49].

Enhancing technologies present problems in terms of safety and preservation of the state of health, in the face of a benefit/risk ratio that is still partly obscure. This aspect concerns the persistence and reversibility of the effects of neuroenhancement, especially from a psychological-social perspective [50]. There is clearly a need for further research regarding the safety and effectiveness of neuroenhancers [51] – a request supported by the fact that current knowledge about their positive and negative effects, especially regarding cognition enhancing drugs, is insufficient when it comes to usage by healthy subjects [52].

However, objections against such techniques often rely on an alleged moral asymmetry between what is “natural” and “artificial”, with traditional methods of enhancing cognition being put in the first category – and thus considered *a priori* morally permissible -, and neuroenhancers being put on the second one – being perceived as artificial products and qualified as morally impermissible, automatically discarded from consideration.

The lack of conclusive data about the use of neuroenhancers on healthy individuals and long-term effects, combined with philosophical assumptions that they go against what is natural for human beings, many times point to a prohibitive approach when it comes to possible uses and future research. This concept of “human nature” is often used as a reference state for the purpose of describing what is, and to justify moral arguments against an enhancement enterprise [53].

5 The Cognitive Enhancement Continuum

According to Ienca, neuroenhancers, such as pharmacological nootropics, should not be seen, from an ethical standpoint, as qualitatively different from other activities such as healthy diet, sleep, education, mental and bodily exercise, and information technology. Making an analogy with the immune system, he explains that:

[...] physicians and public health promoters do not hold the assumption of a presumed default mode of the system. They rather aim at system optimization, namely, the state of the immune system in which it is most capable to protect an organism against disease. In other words, they try to indefinitely maximize the functioning of that system. The only clause that is usually put to this indefinite enhancement of the immune system is that the system augmentation should not thereby cause negative effects of comparable relevance on other related systems [54].

In contrast, the author suggests that they should be viewed in continuity with other “traditional” activities through which human beings try to improve themselves. Having similar effects on cognitive functioning, these methods should have similar levels of ethical permissibility regardless of the physical medium through which they are administered.

Considering this moral equivalence, Ienca considers unjustified to qualitatively differentiate *a priori* between their moral status, calling for an evidence-based approach to the risk–benefit ratio of neuroenhancers: “If something can improve one or many mental abilities, without thereby causing side effects of comparable relevance, then it is morally permissible to promote its application and diffusion” - a simple heuristic that he calls the Minimal Rule for Neuroenhancement Administration (MiRNA) [55].

To Ienca, objections against the neuroenhancement continuum often rely on an alleged moral asymmetry between two loosely defined qualities: the artificial and the natural. The appeal to the natural as a morally relevant category is, however, vague, and the lives of almost all living humans nowadays are profoundly unnatural.

Under the Minimal Rule for Neuroenhancement Administration, it is possible to distinguish three categories of cognitive enhancement: (A) permissible without restrictions, (B) permissible with restrictions, and (C) impermissible unless exceptions apply.

Category A enhancers have epidemiologically infrequent side effects that are typically related to substance abuse, and its use and administration have been scientifically proven to result in potential benefits and/or cause negligible adverse effects. Substances that can be indexed under this category are iodine, many natural adaptogenics and stimulants (e.g., caffeine, beta-blockers), omega-3 fatty acids, isoflavones, cholinergics (arecoline), some acetylcholinesterase inhibitors (e.g., sage, rosemary), some vasodilators (Ginkgo biloba), some reuptake inhibitors (coluracetam, ginsenoside sources), some nerve growth stimulators (melatonin, glutathione), and all vitamins.

Under Category B are indexed all enhancers whose administration has been scientifically proven to provide high potential benefits with an appreciable degree of unintended negative side effects. Examples include eugeroics (modafinil, adrafinil), adrenergics (atomoxetine, reboxetine, synephrine), some dopaminergics (methylphenidate), among others. These substances typically display high potential benefits and have been scientifically proven to effectively enhance cognition [56]. They have appreciable adverse effects, whose potential harm levels range between the moderate and the considerable, but still widely below the benefit levels.

Finally, under Category C are indexed all those enhancers that are not scientifically proven to confer significant benefits, and/or cause high and/or disproportionate adverse effects, thus failing to satisfy the conditions necessary according to MiRNA. Examples are stimulant alkaloids (cocaine), nicotine, benzodiazepines, dissociatives (phencyclidine) and barbiturates – all agents that typically have no experimentally significant positive effects or have little positive effects that are disproportionate to the adverse effects [57].

The author highlights that approaching the problem of cognitive enhancement from the perspective of risk–benefit ratio does not imply giving up substantive ethical concerns, such as safety. This concern is synthetically expressed by the principle that the maximization of potential benefits must be balanced against the minimization of adverse side effects. For most cognitive enhancers on the market today, the fourth phase of clinical trials, which consists in post approval studies (i.e., the post approval and post marketing phase in which the risks and benefits are further monitored and the drug’s

optimal use is finally delineated) has not been fully completed. Therefore, further longitudinal studies focusing on the long-term side effects are still required.

There are also concerns regarding self-determination, mental integrity, and cognitive liberty of individuals. One possible exception to these concerns could be the case of specific occupational figures, such as surgeons and airplane pilots. There are already reports of the use of drugs such as modafinil and Ritalin within the US Air Force, where pilots may be indirectly coerced into enhancing [58].

Also, Goold and Maslen have also analyzed whether surgeons who make fatigue-related errors during patient care might be considered obliged to enhance themselves [59]. This raises the questions of whether judges could also be included in this exception, thus having an obligation to undergo cognition enhancement in order to improve the quality of their decisions – a possibility to be further explored in the future.

6 Concluding Remarks: A Way Forward

The studies and experiments on implicit biases mentioned throughout this work serve to illustrate how judges frequently fall prey to the same systematic errors that lay people present when making decisions, due to the effects of cognitive heuristics and biases. However, there are high stakes involved in judicial decision-making, not only for the parties directly involved in a case, but also for society in general - which raises the question of how the judicial decision-making could be improved to result in fairer and impartial outcomes.

This paper aimed at reviewing methods commonly pointed out to improve the quality of judicial decision-making. First, by making judges aware of the causal factors and extralegal determinants of their decisions, findings from the cognitive sciences can help them avoid bias, improving their underlying decision-making abilities. Being mindful of these judgment errors, however, is just the first step in trying to solve the problem.

Exposing implicit biases, although helpful, is not enough to overcome their occurrence, since the factors that cause it are not always under judges' control. For instance, it was seen that the institutional context on which judges act provides them with little prompt and useful feedback regarding their decisions, and existing forms of accountability primarily focus on a judge's performance in a particular case, not on the systematic study of long-term patterns within his performance that might reveal bias.

The institutional capacity of the courts and the applicable rules of procedure and evidence can foster different decision-making environments, thus changing the schemas created by individual judges and nudging decisions in a particular direction. Judicial review and auditing, the adoption of scripts, checklists, and multifactor tests, training, peer-reviewed feedback and opinion writing could be implemented in order to reduce the effects of bias in judicial outcomes.

The various cognitive and emotional processes involved in judicial decision-making could also be enhanced using emerging technologies that are increasingly being explored to improve cognitive function in healthy individuals (e.g., neurological and pharmacological means of cognitive and moral enhancement). These methods present the possibility of improving mental processes (concentration, working memory, processing

speed and executive functions), and could be useful for improving judicial performance. In order to do so, however, two main obstacles need to be overcome: first, further studies and experiments are needed to guarantee the safety of these cognition enhancers; and second, ethical and legal considerations regarding a possible duty for judges to undergo cognitive enhancement need to be put forward. Still, gains in accuracy, and therefore justice, may be worth future investigation.

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