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EDITORIAL

Judges, justice, and power: Reorienting decision science

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Abstract

The field of Judgment and Decision Making has had tremendous success in understanding and improving decision-making in several domains from business to medicine, and it is now time to turn our efforts to the legal domain. The two schools of thought that dominate our field (coherence and correspondence) have generated a set of rich ideas as well as useful methods that can be applied in this context. However, both schools have been somewhat narrow in their focus on what is a 'good' decision. If we care about 'good' decisions, then we must also care about 'just' decisions. We ought to use our science to scrutinize the exercise of judicial power in the search for justice, and therefore in the service of justice. The direct relevance to our field is the fact that justice is a product of decisions, and these decisions are made under conditions of risk and uncertainty. We could reorient our science and put our intellectual resources into extending and applying our theories and methods in the following three ways. (1) Focus on justice as an outcome alongside, or even above the other sorts of outcomes we routinely study. (2) Study the exercise of judicial power in all its guises. (3) Scrutinize the algorithms that increasingly influence or replace judicial power. Justice can be modelled, measured, and improved — but only if we choose to prioritize it.

1. Introduction

As decision scientists or judgment and decision-making (JDM) scholars,[1] we are in the business of understanding and improving human JDM.[2] We construe decision-making as a cognitive, emotional, and behavioral response to risky or uncertain situations that people are faced with. We have developed testable theories to describe and explain these responses. And, we have at our disposal an array of methods that enable us to precisely create or delineate decision situations and measure responses. To this extent, the potential of our field is great.

In fact, the field has been tremendously successful. I mean this in terms of indicators such as the number of dedicated societies/associations and journals, the rate of citations to our published work, the number of prestigious honors and awards scholars in our field have received, having funding calls targeted at us, and the attractiveness of our field to new students as well as scholars from other fields.

[1] Preamble: I am honored to deliver the Presidential Address at the 2025 meeting of SPUDM—a meeting that has been at the heart of decision science in Europe for over half a century. SPUDM was the first academic conference that I attended in 1997 in Leeds, when I was a PhD student. I have attended each meeting since then. As I look around this room, I see so many familiar faces—people who have been my mentors, friends, and intellectual peers. However, I also miss seeing some faces—scholars who have retired or who are sadly no longer with us. Perhaps most noticeable to me is how many new faces I see—these are the next generation of decision scientists who will move our field forward in what are challenging but exciting times. So, with that in mind, I want to take this opportunity to reflect on the history and contributions of our field, and to call for us to reimagine our science for the future.

[2] For brevity, I use the terms judgment and decision-making interchangeably.

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We have also been successful in terms of media and public attention to our work as well as in terms of the tangible benefits that our work has had in practical contexts and policymaking circles. But, I ask: can we do even more? And, can we do even better?

In order to answer these questions, I want us to reflect on the sorts of decisions and decision-makers we have typically studied and the types of decision outcomes we have tended to value. I appreciate the impact we have had in improving decision-making in several domains from business to medicine, but I would like us now to turn our efforts to another domain, namely, the law. In sum, I would like us to reorient our science to study the exercise of judicial power in the search for justice, and consequently in the service of justice. But, before I suggest why and how we might do this, I think it is useful to consider if our science is fit for that purpose.

2. A science in search of rationality and achievement

Our field has strong, deep, and diverse intellectual roots.[3] Key concepts such as choice and rationality have been debated over millennia, and useful tools such as probability theory and statistics emerged centuries ago. But, our field is relatively young if we think about it in terms of, for example, our use of Subjective Expected Utility Theory (Savage, 1954), Bounded Rationality (Simon, 1955), and the Lens Model (Brunswik, 1952), which all appeared in the early 1950s.

From its inception, the ambition of our field has been broad. We ask normative, descriptive, and prescriptive questions. How should people make decisions? How do they make decisions? And, how can we help people do what they should? In our efforts to answer these questions, we have made choices ourselves about the intellectual roots we wished to cultivate: What normative theory should we test? What descriptive model should we use? What solutions should we prescribe? We have also made choices about the sorts of decision-making problems to prioritize and outcomes we value by focusing our attention on them. Our choices have influenced not only how we do our research but also how we have tended to think about human JDM.

Let me explain what I mean by referring to two historically popular schools of thought in our field usefully identified by Ken Hammond (1990, 2000), and which are still very much visible today. Hammond (2000) distinguished between what he called the 'coherence' and 'correspondence' schools of thought (see also Hammond, 1990).

2.1. JDM as coherence

In the coherence school, decision competence is viewed in terms of internal coherence, and performance is assessed against normative benchmarks such as Subjective Expected Utility theory and probability theory. Amongst the coherence group, was Ward Edwards (1954, 1961; Edwards et al., 1963), arguably the pioneer of our whole field who connected behavioral research with the aforementioned normative models. Later, Kahneman and Tversky (1979) introduced prospect theory, and together with their colleagues also established the hugely popular heuristics-and-biases research program (Kahneman et al., 1982).

To test their theories, scholars in this school went into the laboratory to study samples of ordinary people (often students) presented with what I respectfully call extraordinary (or artificial) decision situations. Researchers typically measured single-shot responses taken from individuals presented with factorially designed stimuli and then compared group-level averages. While this paradigm allows for experimental manipulation and control over specific variables, thus increasing internal validity, it comes at the expense of threats to external validity and generalizability.

[3]I am going to give you a whistle stop tour and potted history of our field. I sincerely apologize in advance for any omissions and oversimplifications—these were necessary for brevity. For those of you who are new to the field, I hope you will find this summary grounding, and for others, please bear with me as there is a reason for this recap.

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The following example illustrates how the coherence approach has been used to identify systematic departures from normative standards of rational choice. Kahneman and Tversky (1979) presented participants, many of whom were university students, with hypothetical choice problems involving risky prospects. Participants chose between alternatives defined by monetary outcomes and probabilities. Participants' responses were analyzed by comparing aggregate patterns of choice with the predictions of Expected Utility Theory. Across problems involving both gains and losses, participants displayed systematic departures from the normative model, including the certainty effect (the tendency to overweight certain outcomes relative to probable ones) and the reflection effect (the reversal of preferences across gains and losses, with risk aversion for gains and risk seeking for losses). These findings contributed to the development of Prospect Theory, which proposed that people evaluate outcomes relative to reference points and transform probabilities rather than simply maximizing expected utility. Overall, Kahneman and Tversky's (1979) research not only challenged prevailing normative accounts of rational choice but also established one of the most influential descriptive theories of decision-making under risk, shaping JDM research and recognized in Kahneman's award of the 2002 Nobel Memorial Prize in Economic Sciences.

The coherence school of thought has helped to define what it means to be rational (see Gilovich et al., 2002; Kahneman et al., 1982; Stanovich et al., 2008). It has shown when and why human JDM diverges from standards of rationality (Evans, 2008; Stanovich & West, 2000). Scholars have keenly pointed out that people are cognitively lazy and rely on heuristics which lead to biased responses, with some even suggesting how such people can be exploited (Fox, 2006).

Early efforts to remedy the apparently dismal performance focused on promoting decision analysis for structuring the decision task in a way that makes 'rational' evaluation possible (Raiffa, 1968). These were followed by attempts to provide debiasing interventions that raise awareness of biases or fill 'mindware' gaps by teaching relevant rules or strategies to use in specific situations (for reviews, see Arkes, 1991; Fischhoff, 1982; Larrick, 2004; Lilienfeld et al., 2009). Nowadays, choice architectures are being redesigned to 'nudge' or steer people into making decisions that are considered more beneficial either for themselves or for society, and arguably this reduces their need (or right) to think and choose for themselves (Thaler & Sunstein, 2008; for a review, see Mertens et al., 2022).

2.2. JDM as correspondence

Around the same time as Edwards, Kahneman and Tversky and their colleagues were working, Ken Hammond, inspired by Brunswik's (1952) Lens Model, was leading the correspondence school of thought (Hammond, 1955). Here, decision competence is viewed in terms of empirical accuracy, and performance is assessed against some external criterion such as whether a patient really has a particular health or medical condition. Hammond and his students proposed Social Judgment Theory, which models both the judgment policy (human) and decision task (environment) and then measures how well the human learns the task and applies that knowledge (Hammond et al., 1975). Gigerenzer and the ABC research group (1999) later introduced the concept of 'ecological rationality' to describe this achievement (or accuracy).

To apply their theories, scholars in this school were often led outside of the laboratory to study professional or expert samples such as clinicians and physicians facing decisions they were trained and experienced to make, and which affect others (for reviews, see Dhami et al., 2004; see also Hertwig et al., 2013).[4] Researchers here emphasized the need to take repeated measures from individuals presented with representatively designed (e.g., randomly sampled) stimuli, in order to model and compare individuals' response patterns or 'judgment policies' (see Dhami et al., 2004).[5] As such, this

[4] The more recent focus on ecological rationality has reverted some attention to studying ordinary people but they are faced with commonly encountered decision situations such as mate choice (e.g., Todd & Miller, 1999).

[5] Dhami et al. (2004), however, observed that the challenge of representative design was often too burdensome for researchers who supplanted it with stimulus sets that were factorially constructed.

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paradigm emphasizes the importance of increasing external validity and generalizability, with some arguing that only representative design produces internally valid findings in terms of demonstrating the normal functioning of cognitive mechanisms (Hammond, 1954).

The following example illustrates how the correspondence approach can be used to describe expert judgment under representative conditions and explain how characteristics of both the decision-maker and the decision environment influence judgment achievement. Hammond et al. (1987) asked 21 expert highway engineers to perform three judgment tasks i.e., rating the aesthetics, safety, and capacity of 40 highways, which were presented using representative filmstrips, bar graphs, and engineering formulae. The researchers carefully analyzed each task to identify the cues available (e.g., lane width was one of 10 cues relevant to judging road safety), together with their values, intercorrelations, distributions, and ecological validities (i.e., correlation between cue and criterion). For each highway, they also established an external criterion against which judgment achievement could be assessed (e.g., accident rate was calculated as the average number of accidents per vehicle mile travelled over a seven-year period). Each engineer's judgments were analyzed separately. The study demonstrated that judgment achievement depends on the correspondence between the informational structure of the environment (e.g., ecological cue validities) and the judge's cognitive policy (e.g., cue utilization), and that intuitive or quasi-rational cognition can sometimes outperform more analytical approaches. Overall, Hammond et al.'s (1987) research not only generated practical recommendations for improving highway engineering judgments but also challenged the prevailing intuition-analysis dichotomy by suggesting that human cognition is best understood as a continuum, with judgment achievement depending on the correspondence between cognitive processes and the probabilistic structure of the decision environment.

The correspondence school of thought has helped define what it means to achieve or 'get it right', and how this is done (for reviews, see Dhami & Mumpower, 2018; Karelaia & Hogarth, 2008; see also Gigerenzer et al., 2011). It has demonstrated when and why achievement is lower than that possible given the probabilistic nature of the task. The emphasis here has tended to be on people getting things right without always needing to exert much cognitive effort. For example, Banks et al. (2020) recently observed that officers who were trained to use a simple heuristic to make infantry decisions were as accurate as those using a more complex analytic approach. Of course, achievement with simple heuristics is only possible if the environment allows (i.e., is simple), and this appears to be the case for a range of environments (e.g., see Gigerenzer et al., 1999, 2011; Hertwig et al., 2013).

Attempts have been made to increase achievement by, for example, providing cognitive feedback i.e., information on characteristics of the human's judgment policy and the decision task (see Holzworth, 1999) as well as cognitive (decision) aids (Hammond, 1971). Suggestions have also been made to alter features of the decision task such as how information is presented in order to facilitate reasoning, particularly with numeric information (Gigerenzer & Hoffrage, 1995; for a review, see McDowell & Jacobs, 2017). More recently, it has been pointed out that there remains a need to 'boost' individuals' cognitive skills and abilities so that they are empowered to make better decisions either for themselves or for others (Hertwig & Grüne-Yanoff, 2017).

In sum, both schools of thought have generated a set of rich ideas as well as useful methods that I believe can be applied to the legal domain. However, both schools have been somewhat narrow in their focus on what is a 'good' decision, and I will expand on this later. For now, suffice it to say that if we care about 'good' decisions, then I believe we must also care about 'just' decisions. And, that is why I believe we must use our science to scrutinize the exercise of judicial power in the search for justice, and therefore in the service of justice. The direct relevance to our field is the fact that justice is a product of decisions, and these decisions are made under conditions of risk and uncertainty.

3. The judicial exercise of power

In the criminal justice system, for example, where I have spent much of my career, court judges decide whose risk to society is great enough for them to be incarcerated, and who gets released on parole or

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otherwise granted liberty. In making such decisions, court judges wield power. In fact, court judges are perhaps some of the most powerful actors in any society.

The power of court judges lies partly in the fact that they interpret and apply the laws passed by legislature—making decisions that govern how our societies function, including in economic terms. Their decisions can even result in new legal precedents that further shape our lives and livelihoods. Court judges are also tasked with upholding the constitution, where applicable. They are the ones we rely on to ensure that our rights and freedoms are protected. And, judges have the power to affect our daily lives directly. For instance, they punish us if we have been found breaking the rules, and in doing so, support us if we are wronged. In fact, their reach goes deep into our personal lives, insofar as, for example, repossessing our homes and losing custody of our children.

Beyond the vast reach of judicial decisions, there are other disturbing aspects of judicial power. These include the fact that judges cannot be held personally accountable for their decisions in the same way a business executive might be demoted or fired, or a physician might be sued for malpractice and 'struck off' the register (e.g., Sirros v. Moore [1975] Q.B. 118; Stump v. Sparkman, 435 U.S. 349 [1978]). For judges, personal accountability is deemed to be incompatible with the principle of judicial independence.

In some jurisdictions, and in some types of cases, a sense of accountability may be derived from judges making decisions in the 'open' courtroom. On the whole, however, the notion of judicial accountability tends to lie in the requirement that judges give reasons for their decisions, which some argue are simply post hoc rationalizations, circular arguments, or tick-box exercises (e.g., Guthrie et al., 2007; Hall & Wright, 2008; Liu & Li, 2019). There is also accountability in the potential for appellate review. However, this is relatively rarely used and at best simply reverses a judicial decision without holding the decision-maker accountable.[6]

Another concerning aspect of judicial power is the considerable discretion afforded to judges in decision-making. Although judges must apply the law, determining what the law means in a particular case often requires interpretation and judgment. Legal rules, guidelines, and policies are frequently expressed in general and open-textured terms, meaning that their application to individual cases may involve competing interpretations thereby making it difficult for non-specialists to evaluate whether they have been applied appropriately (Hart, 1994). Furthermore, the technical language of law can create an additional barrier to public understanding and scrutiny of judicial decisions (Tiersma, 1999).

Even in jurisdictions or cases where the search for justice sometimes relies on lay people (whom we call jurors), judges wield considerable power. They preside over the evidence and testimony presented to jurors and instruct them on how to perform the decision task presented to them, arguably sometimes confusing jurors more than informing them (e.g., Kramer & Koenig, 1990; see also Spivak et al., 2018). And, judges, through appellate review, are the ones who assess jury decision-making—correcting or reversing decisions where they deem necessary.

For me, perhaps most unsettling is the fact they are called 'judges'. In that name, both they and the rest of us may assume that court judges are good decision-makers and that their decisions are just. Unfortunately, over the years, my own research, along with that of several others in fields such as Cognitive and Social Psychology, Law, Criminology, and Political Science does not support this assumption (e.g., Dhami et al., 2007; Guthrie et al., 2001; Jacobi & Schweers, 2017; Klein & Mitchell, 2010; Rachlinski & Johnson, 2009; Simon, 1998, 2004, 2012; Spamann & Klöhn, 2016; Spohn, 2009; Sunstein et al., 2006).

3.1. Justice or just decisions?

Let me give you a flavor of what I have learned so far about the exercise of judicial power. To this end, I organize my findings along the normative, descriptive,[7] and prescriptive questions asked in our field.

[6] In many jurisdictions, the legislature may routinely intervene to modify the legal landscape and effectively override judicial precedents.

[7] I will not discuss issues of variability in judicial decisions, nor judicial bias and the use of extra-legal factors such as race, which are all common findings in the literature (for reviews, see Mitchell, 2005; Rachlinski & Wistrich, 2017).

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From a normative standpoint, the rational actor model has been very influential in the legal domain (Becker, 1968; Posner, 1997; for a review, see Finkelstein, 2004). The scales of justice depict what is required to arrive at a just decision—it implies information weighting and integration (i.e., a compensatory decision process) which involves using legally relevant information and ignoring legally irrelevant information, and being unbiased. Judges are additionally expected to apply legal rules and procedures, and make decisions on an individualized (or case-by-case) basis, while being uniform! This must all occur in a transparent way.

However, as our field has clearly shown, descriptively, this is a psychologically unrealistic ideal (also see Jolls et al., 1998). The search for justice is shaped by the cognitive abilities and capacities of the (human) judge. And so, in order to understand how (unaided) judges actually make decisions, I have typically studied two types of judicial decisions made in the criminal justice system. One, namely pretrial detention, is an early decision made on a case as it begins its journey through the court process, and so it is a very common decision problem faced by judges, but also one that usually remains outside of the public purview. The other, namely criminal sentencing, is less common because it occurs only in a case that has progressed through to the later stages of the court process (in many cases defendants are acquitted), but it is also arguably one of the most publicly visible decision problems faced by judges.

In early work, I modelled the judgment policies of individual (lay and professional) judges making decisions on experimentally designed cases, as well as decisions made by benches of judges on real cases, in real time, in the courtroom (e.g., Dhami, 2003; Dhami & Ayton, 2001). I revealed that pretrial detention decisions are not the result of a compensatory process, where legally relevant information is weighted and integrated—that is a myth. Instead, according to the cross-validated models, judges (subconsciously) simplified the cognitively complex task by applying a non-compensatory, one-cue decision process, typically relying on what may be considered 'crime control' cues. Judges 'pass the buck' by rubber-stamping the earlier police bail/remand decision or they follow the prosecution's request. Simply put, pretrial detention is 'fast and frugal justice'.

In more recent work, I analyzed the sentences meted out over one year in two different jurisdictions (Dhami et al., 2020). I showed that the notion of judicial decisions being individualized, where each case is dealt with on its own merits, is also a myth. When (lay or professional) judges choose a criminal punishment, they are (subconsciously) influenced by the continuous nature of the sentencing response options or scales available to them, such as duration of time in prison or amount of monetary fine. In over 90% of cases, judges deferred to predictable patterns of preferred numbers, with just noticeable differences (Weber's law) that increase logarithmically (Fechner's law). For instance, the following 21 numbers accounted for 89% of the 45,631 cases sentenced to (days in) custody in one jurisdiction: 14, 28, 30, 42, 56, 60, 90, 120, 150, 180, 270, 360, 450, 540, 720, 900, 1,080, 1,260, 1,440, 1,800. Simply put, criminal punishment is 'rough justice'.

Even where cases are handled by lay people (jurors), such as during trial, judicial decisions about how to instruct them may undermine the search for justice. I have quantitatively demonstrated the fuzziness of the probabilistic threshold for criminal conviction (i.e., 'beyond a reasonable doubt') that is communicated to jurors (e.g., Dhami, 2008; Mueller-Johnson et al., 2018). For instance, this standard of proof is so imprecise in individuals' minds that it may span over half of the probability scale, and the variability across people is similarly great. In addition, I have found that appellate judges appear to struggle to identify and correct the source of the fuzziness in judicial instructions that have arguably led to miscarriages of justice (Dhami et al., 2015). Simply put, criminal conviction (as overseen by judges) is 'fuzzy justice'.

As I mentioned earlier, the notion of judicial accountability tends to lie in the requirement that judges give reasons for their decisions. However, this is only meaningful if they are aware of their decision processes, willing to report them, and able to do so linguistically. In studying pretrial detention decisions, I have found a predictable discrepancy between the information that (lay and professional) judges report as being important to their decisions and the information that is contained in the models which predict their decision behavior (Dhami & Ayton, 2001). Unsurprisingly, legally relevant

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information is given more weight in self-reports whereas legally irrelevant information is given more weight in the models.

Finally, from a prescriptive standpoint, given that judicial decision behavior departs from what is required or expected, efforts have been made to improve judicial decision-making. As mentioned earlier, the search for justice is limited by the cognitive capacities and abilities of the (unaided) human judge, but it is also constrained by features of the decision task (environment). Therefore, interventions may be made on both fronts.

The main challenge that I find to interventions 'boosting' the judge is the fact that judges believe their legal training and experience make them immune to the sorts of cognitive biases that may afflict others (Edmond & Martire, 2019). In fact, judges are highly confident in their decisions. I have observed average post-decisional confidence ratings of around 8 to 9 on 0–10 scales (Dhami, 2002, 2005; Dhami & Ayton, 2001). Confidence among (lay and professional) judges is high regardless of the decision made (e.g., to bail or jail), even when decisions are the product of an undesirable heuristic strategy, or when judges demonstrate intra-individual inconsistency in their decisions.

Typically, interventions involve providing judges with more (legally-relevant) information and/or providing them instructions on what to do with the information i.e., guidance on the decision process. I have found that while judges may welcome the former, they are less enthusiastic about the latter (Dhami, 2013).

In fact, when assessing some interventions, I have also uncovered actualities that run counter to the prevailing beliefs about their effectiveness. For instance, so-called 'bail information schemes', which provide critical information on a defendant's ties to the local community that are relevant for assessing the risk of absconding, do not have a significant effect on pretrial detention decisions (Dhami, 2002). This is because judges had other information that they considered to be more important/useful. Perhaps unhelpfully, the intervention did serve to further increase judicial post-decisional confidence.

Guidelines, such as those for criminal sentencing, instruct judges on what information to use and how to use that information. And, in doing so, they may promote different modes of thinking i.e., rigid guidelines may encourage analytic thinking, vague guidelines may foster intuitive thinking, and a combination may facilitate quasi-rational thinking (Dhami et al., 2015). However, I have revealed that guidelines may also (unintentionally) promote injustices, for example, through undermining the notion of proportionality i.e., that a punishment fits the crime.[8] In an analysis of sentencing guidelines in England and Wales, for example, I have shown that by including more offender- than offence-related factors, judges may be led to punish the offender rather than the offence (Dhami, 2023). I have also revealed that in their efforts to help judges cope with the cognitive complexity of sentencing offenders who have been convicted of (or plead guilty to) more than one offence, guidelines have restructured the task so it more closely resembles the task of sentencing offenders for a single offence. However, in doing so, judges may be led to mete out more lenient punishments to offenders in multiple-offence cases compared to their single-offence counterparts (Dhami, 2021). Indeed, offenders in multiple-offence cases are less likely to appeal their sentence after introduction of the relevant guideline, suggesting their relative contentment with the punishment they received (Dhami & Bechan, 2025)—but had justice really been served?

Currently, I am investigating whether judicial decision-making can be improved by 'nudging' the judge, namely through restructuring the decision task so that the default option tips the scales of justice. In the context of pretrial detention, I use a comparative law perspective (Dhami & van den Brink, 2022) to redesign the decision task in one jurisdiction with higher pretrial detention rates so that it includes features of the task from another jurisdiction with comparably lower rates. The aim is to tip the scales

[8]In fact, the pursuit of justice is not only influenced by judicial factors themselves but also by legal policy and procedural rules, such as restrictions on the admissibility of evidence concerning a defendant's prior misconduct to minimize unfair prejudice (Redmayne, 2002), and the challenges associated with interpreting and applying legal standards of proof (DeKay, 1996).

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in favor of defendants by releasing those who have yet to be convicted until their trial date. However, it is unclear if justice is really served when we shift the balance in this way.

3.2. Judges and their powerful algorithms

In recent years, advances in artificial intelligence (AI) have begun to reshape judicial decision-making. While human judges continue to decide on the vast majority of legal cases, courts in many jurisdictions have adopted algorithmic tools to assist judges, with some (low-level) cases being resolved through partially or fully automated processes (Paar, 2025; Tang, 2025). Clearly, this is a new challenge for those of us who study the exercise of judicial power. It raises questions about the allocation of decisional authority between human and algorithmic actors, the nature of judicial discretion, and the extent to which AI systems can satisfy the legal ideals of fairness, accountability, transparency, and due process. Understanding how algorithms shape judicial decisions now represents an important extension of research on judicial decision-making.

Although these algorithms are frequently promoted as improving the consistency and objectivity of judicial decision-making (e.g., Kleinberg et al., 2018), research has identified significant limitations. Algorithms may reproduce or amplify historical biases embedded within the data on which they are trained, potentially perpetuating existing inequalities in legal outcomes (e.g., Angwin et al., 2016). Moreover, many commercially developed systems operate as proprietary 'black boxes', limiting independent scrutiny of their underlying logic and making it difficult for judges or others to evaluate the basis of algorithmically generated decisions (Kroll et al., 2017).

A prominent example is COMPAS (Correctional Offender Management Profiling for Alternative Sanctions), which is a proprietary risk assessment tool used in several Western jurisdictions to estimate an offender's likelihood of recidivism (see Brennan & Dieterich, 2018). Although originally developed to support correctional management decisions, COMPAS scores have also informed judicial sentencing decisions, fueling debates about their validity and fairness (Dressel & Farid, 2018; State v. Loomis, 2016). Our field has not fully reckoned with how decision-making processes are being embedded into these algorithms. We must therefore bring our expertise to bear not only on human judges, but on hybrid judge-AI decision systems, and the algorithms themselves.

4. Decision science and the search for justice

So what should we do? I am not suggesting that we all 'down tools', study for a law degree and enter the nearest courtroom with our measurement devices. Nor am I suggesting that we ought to give up on the research topics we are currently engaged in, if we truly believe they are important. I am also not asking us to abandon our theories and methods. Indeed, quite the opposite! I am simply asking if we could reorient our science and put our intellectual resources into extending and applying our theories and methods in the following three ways:

(1) *Focus on justice as an outcome* alongside, or even above the other sorts of outcomes we routinely study. Let us define with precise theories and models the standard for what makes a decision 'just', as we have already done for what makes a decision 'rational' or what 'achievement' means in a decision-making context.
(2) *Study the exercise of judicial power* in all its guises, including decisions made by court judges in both criminal and civil or public and private law, and on a range of matters including criminal, corporate, family, employment and environmental. Let us demonstrate with empirical rigor when and why justice is not served.
(3) *Scrutinize the algorithms that increasingly influence or replace judicial power* by, for instance, assessing their computational (reasoning) processes, informational bases and biases, and outcome fairness, as well as studying issues such as judge-algorithm interactions (which include trust in algorithms, algorithm effects on thinking, etc.), and the legitimacy of ensuing decisions. Let us use the legal domain as an illustration of what our science has to contribute in the age of AI.

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4.1. Applying and innovating our science

Earlier, I asked us to consider if our science is fit for the purpose of studying the exercise of judicial power in the search for justice. I believe it is, but we have some serious thinking to do, and we may need to bridge some intellectual divides.

From a methodological standpoint, we already have an array of sophisticated tools including Bayesian models, signal detection theory, judgment analysis, game theory, simulations, experiments, process tracing, and so forth that can help us to rigorously and comprehensively examine judicial decisions. And, of course, we will need to further diversify our approach, for example, to include algorithmic audits.

We will also need to study judicial decisions in both controlled and field situations, and fortunately, large court datasets are increasingly freely available for the latter (e.g., see https://caselaw.nationalarchives.gov.uk/; https://case.law/; and even via Google Scholar with efforts underway to develop human-in-the-loop AI tools that embed Open Science features when researching with court datasets, Dhami et al., 2026). Field studies, however, do not automatically guarantee generalizability if researchers do not fully understand the decision environment. For example, Danziger et al. (2011) interpreted systematic declines in favorable parole decisions across a decision session as evidence that extraneous factors, namely, mental depletion associated with the timing of judges' meal breaks, influenced decisions, representing a departure from coherence criteria. Subsequent research, however, argued that this pattern may be explained by features of the decision environment such as non-random case scheduling (e.g., the ordering of unrepresented prisoners toward the end of a session) and other structural or strategic constraints, rather than by a simple depletion bias (Weinshall-Margel & Shapard, 2011; see also Glöckner, 2016). This highlights the importance of characterizing the decision environment before drawing conclusions about the cognitive mechanisms underlying judicial decision-making. Crucially, we will need to pay close attention to issues of generalizability across jurisdictions, if we wish to have a wide-reaching impact.

We will also need to be astute and persistent if we wish to sample judges for primary research purposes. Although many of us are familiar with including professional or expert samples in our research, judges, as powerful actors, can easily shun the scientific gaze (Gupta & Harvey, 2022). How can we encourage them to participate in research that has a high likelihood of revealing flaws in their behavior?

And, research participation will also need to extend beyond judges to those at the receiving end of their decisions as well as citizens who observe, evaluate, and shape conceptions of justice. This is because judicial decisions must be examined not only in terms of their coherence with legal principles and procedures, but also in terms of their correspondence with broader normative objectives and societal expectations regarding justice (Baron & Ritov, 1993; Wilkinson-Ryan & Baron, 2009). For example, even when a judge behaves in coherence with the law, citizens may regard the decision as unjust. Conversely, citizens may have strong moral intuitions about punishment or compensation which differ from that embedded in law.

From a theoretical standpoint, our field is perhaps less well prepared, although those of us familiar with game-theoretic work on topics such as fairness, cooperation, trust, punishment, and altruism may have a useful foundation on which to build. More generally, normative theories of justice have been developed within philosophy, economics, political science, and law, including utilitarian and welfare-based approaches (e.g., Harsanyi, 1975; Kaplow & Shavell, 2002; Rawls, 1972). However, these theories have not been fully integrated into the mainstream coherence and correspondence traditions that have shaped our field. Consequently, justice has rarely been treated as a primary outcome in JDM research in the way that rationality or empirical achievement have been. Likewise, although rational actor models underpin much of the law and economics tradition, they are far from dominant in legal scholarship. Other frameworks have gained prominence. Perhaps the best known within psychology is Tyler's (1990) procedural justice framework, which explains perceptions of fairness and legitimacy through principles such as voice, neutrality, respect, and trustworthiness, rather than prescribing a normative theory of justice.

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The challenge is that justice is a multifaceted concept. It is conceptualized somewhat differently across the disciplines that have traditionally studied it, and it is also construed differently by those who formulate legal principles, those who apply them, and those who experience or evaluate their consequences. For present purposes, perhaps we can begin with the premise that justice encompasses multiple complementary dimensions identified across different literatures, including distributive justice (fair outcomes), procedural justice (fair decision processes), interactional justice (fair and respectful treatment; see also Bies & Moag, 1986), retributive justice (fair punishment), and restorative justice (repair and reconciliation).

Our field has tended to value instrumental outcomes such as financial gain, prediction accuracy, or decision consistency. It will therefore be interesting to see how well we fare when we turn our attention to relational and expressive outcomes that characterize many conceptions of justice. The emphasis on 'rationality' and 'achievement' within the coherence and correspondence schools of thought, respectively, will not suffice. Justice is not simply about utility, material outcomes, or even accuracy (whether judged against a normative benchmark such as probability theory or an external criterion such as whether a defendant actually committed the crime). Rather, justice requires decision scientists to engage explicitly with normative theories concerning what outcomes, processes, and treatment ought to be regarded as fair.

Can the two schools of thought coalesce around studying the exercise of judicial power in the search for justice? Ken Hammond was cautiously optimistic about the ability of the two schools to come together and solve big social problems such as justice. In his Hammond (1996) book entitled 'Human Judgment and Social Policy: Irreducible Uncertainty, Inevitable Error, Unavoidable Injustice' he suggested that the two schools could come together through their treatment of error, which is an important consideration when thinking about justice. Indeed, one of Daniel Kahneman's final publications was his co-authored book entitled 'Noise: A Flaw in Human Judgment', in which the issue of unwanted variability in judicial decisions features prominently (Kahneman et al., 2021). Unfortunately, however, some of the late Hammond's (now Emeritus) students (Doherty et al., 2021, p. 64, words in square brackets added) said of the latter book: 'We believe that KSS [Kahneman, Sibony, & Sunstein] missed an opportunity to allow readers to learn about a program of research rich in ideas quite relevant to the purpose of their book. SJT [Social judgment theory] focuses on uncertainty and inconsistency, which exist in physical and social environments, as well as in people's minds. The LME [lens model equation] more than simply complements noise equations in the KSS book. It offers a quantitative way to represent all aspects of noise in interpersonal as well as task/environmental relationships'. In a private reply to the authors, the now late Kahneman stated: 'I put months of work in an effort to write a treatment of the lens model that was both precise and understandable by the general public. In the end I had to admit failure—there was just too much to explain—and we removed all mention of the lens model, much to my regret. . ..As you point out,. . .what we call pattern noise is part of what you call policy' (see https://brunswiksociety.org/wp-content/uploads/2022/06/Kahneman_response.pdf). And so, an opportunity for a leading figure in the coherence school to refer to directly relevant work from the correspondence school was missed.[9]

If researchers in the coherence and correspondence schools start with a focus on understanding and reducing 'unsystematic variation' or 'noise' in judicial decision-making, our science may come closer to the service of justice. However, the effort ought to be jointly pursued through meaningful collaboration; otherwise there is a danger of us coming to two opposing and rather banal conclusions: 'Judges are cognitively lazy, and rely on heuristics which lead to unjust decisions'. And 'Judges can make just decisions without always following the letter of the law and/or even legal procedures'. Scientific conclusions that are more transformative will require a decision science that has also been able to transform itself.

[9]This example also highlights how complex but useful, theoretical and methodological principles in our field can result in their neglect and potential ignorance among future generations of researchers.

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5. Conclusion—A call to action

Let me end where I began when I concluded that our field has been tremendously successful, and I asked: Can we do even more? And, can do even better? As I said before, our field has ambitious goals, and we have been successful on so many fronts. Justice can be modelled, measured, and improved—but only if we choose to prioritize it. I believe that if we put in a concerted effort, then together we can hold powerful judges and their powerful algorithms to account. In doing so, not only would our field be working in the service of justice, but it would also be more future-proof.

Our field is well-equipped. What we need is the will to apply our science where we are not invited but where the stakes are highest. I am not the first in our field to be preoccupied by justice (for edited volumes, see Gigerenzer & Engel, 2006; Hastie, 1993; Mellers & Baron, 1993) but I do feel somewhat alone in being persistently concerned about the exercise of judicial power.

I hope this address has served as both a reflection and an invitation—a reflection of the achievements of our field and an invitation to build on them by reimagining our science. Let us judge the judges (and the algorithms). And, let us judge ourselves by the contribution we make to a just society.

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