Hyper-Knowledge and the Legitimation of Criminal Law

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Knowledge conditions are central to the coherence and operation of the criminal law. These conditions—which comprise the epistemic frame of the law—form the locus of a problem faced by the modern criminal law in liberal democracies. As Nicola Lacey argues, this problem concerns how "co-ordination on knowledge of . . . the facts on which judgments in individual cases are based [is] to be achieved?"[1] Putting it differently, Lacey refers to "the need to generate protocols coordinating the forms of knowledge which must be assembled precedent to a conviction."[2] Lacey analyzes these problems in relation to the functional role of criminal responsibility in the criminal law.[3] For Lacey, the problem of knowledge coordination is intimately linked to a second problem, legitimation. In Lacey's words, changes to criminal responsibility are driven by two "practical imperatives": for the criminal law to produce "a narrative capable of legitimating its power"; and the need to coordinate the types of knowledge on which conviction rests.[4] In Lacey's astute diagnosis, these twin problems—legitimation and coordination—together drive the development of the modern criminal law.

Inspired by Lacey's analysis, in this article, I examine the state of contemporary knowledge conditions and its implications for criminal law. Knowledge conditions are the epistemological frame or setting of the criminal law, and they form the conditions of possibility of the criminal law, with its institutional analogues in criminal process and punishment. Following the sociological approaches to knowledge developed by scholars such as Nico Stehr, I understand knowledge as a social relation—relating individuals, facts, rules, and law—and providing capacity for action, meaning that the effects of knowledge

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[1] See Nicola Lacey, In Search of the Responsible Subject: History, Philosophy and Social Sciences in Criminal Law Theory, 64 Mod. L. Rev. 350, 368 (2001).

[2] See Nicola Lacey, In Dialogue with Criminal Responsibility, 4 Critical Analysis L. 244, 252 (2017).

[3] See further Nicola Lacey, In Search of Criminal Responsibility: Ideas, Interests, and Institutions (2016). Lacey's argument is part of a sophisticated analysis of the significance of criminal responsibility in criminal law, which is understood as a regulatory system governing individual and group behavior.

[4] Lacey, supra note 2, at 252. As Lacey notes, each of these imperatives is itself nested within a broad vision of the criminal law as engaged in a project of governance, and hence intimately linked with the development of the modern state.

are open, dependent on particular configurations of social, economic, and intellectual structures.[5] Viewed in this way, knowledge conditions (and allied matters such as the status of knowers and practices of knowing) impact on all aspects of what may be thought of, broadly, as criminal law decision-making—from law-making, law reform, and policy development, to adjudication, evaluation, and sentencing, as well as bail, parole, and other penal practices.

As knowledge conditions provide a deep structure for criminal law, they exceed the parameters marked by the rules and practices of evidence and proof that govern the criminal process. The rules and practices of evidence and proof are the focus of scholarly study in the sub-disciplinary fields of evidence and procedure. In these fields, scholars have charted matters such as responses by practitioners and courts to the impact of the number of experts, greater specialization within disciplines, increasing complexity in scientific fields, and amplified potential for criticism from either within or beyond the law.[6] But understanding the knowledge setting of the criminal law as part of its conditions of possibility requires going beyond the parameters of evidence and procedure, to examine the deeper and more nebulous epistemic dynamics that form the basis of the coherence and operation of the criminal law. On this reading, knowledge conditions are like the social, historical, political, and institutional context of the criminal law—they give life to the law—and, as such, are of interest to critical criminal law scholars.

As part of a larger project,[7] in this paper, I offer a conceptualization of changing knowledge conditions as they relate to criminal law (criminal law-relevant knowledge). I coin the term *hyper-knowledge* which, in my schema, has four dimensions. First is the massive *increase in the quantum* of knowledges that bear on, or have potential to bear on, criminal law, from the cognitive sciences concerned with the workings of the brain, to social scientific knowledges about the multiple effects of victimization, exclusion, and disadvantage on individuals and communities. In addition, the rise of technical knowledges like generative artificial intelligence opens new and as yet unknown epistemological frontiers. Second, knowledges are also more and more *complex*, with rapid developments and new specialisms generating novel processes of validation and impacting relations between lay and specialist knowledges, for example. Third, the increase in quantum and complexity of knowledge is giving rise to *enhanced dynamism* or even *churn* in knowledge which has destabilizing effects. Fourth, there is *reduced trust in knowledge*, evidenced in amplified doubts about knowledge

[5] See Nico Stehr, Knowledge Capitalism 53-54 (2022); Nico Stehr, Knowledge Societies (1994); see also 2 Peter Burke, The Social History of Knowledge: From the Encyclopedia to Wikipedia (2012).

[6] See Gary Edmond & David Mercer, Experts and Expertise in Legal and Regulatory Settings, in Expertise in Regulation and Law 9 (Gary Edmond ed., 2004); see generally Sheila Jasanoff, Science at the Bar: Law, Science, and Technology in America (1997).

[7] See also Arlie Loughnan, Criminal Responsibility Under Changing Knowledge Conditions, in Routledge International Handbook on Criminal Responsibility (Thomas Crofts et al. eds., forthcoming) (arguing that changing knowledge conditions challenge the three key dichotomies—offense and defense, perpetrator and victim, and responsibility and non-responsibility—across which the inquiry into individual responsibility for crime is structured).

and knowledge-holders. Stretching across these four salient features of change is a more nebulous but equally important dynamic: perceptions about exponential change in knowledge conditions. It is this combination of factors that means these changes need to be assessed together—as changes in the contemporary knowledge condition as such.

This paper has three main parts. In Part I, in order to illustrate the ways in which issues arising from contemporary knowledge conditions extend beyond rules and practices of evidence and proof, I present a case study concerning Kathleen Folbigg. Folbigg was convicted of the homicides of her four children, and, following two special inquiries and fresh evidence, had her convictions quashed twenty years later, in 2023. In Part II, with the aim of capturing the qualitative change in knowledge conditions unfolding in the current era, I present a conceptualization of *hyper-knowledge*, which I construct across four dimensions. In Part III, I consider some of the ways in which *hyper-knowledge* alters (or has the potential to alter) the legitimation needs of criminal law decision-making, suggesting that it demands greater reflexivity in practices such as evaluation and adjudication, as it reconstructs the bases on which the law itself has coherence and social standing.

I. Why Consider Changing Knowledge Conditions? A Case Study

As is now well-known, across Australia and internationally, in 2003, Kathleen Folbigg was charged with the homicides of her four babies who died over a period of ten years between 1989 and 1999, when the children were aged between nineteen days and eighteen months.[8] At trial, the prosecution alleged that Folbigg had smothered each of the children, but the expert evidence was unable to distinguish between Sudden Infant Death Syndrome (SIDS) and smothering. The prosecution sought to support its case by drawing on numerous entries in the diaries that Folbigg kept over those years, which were given to the prosecution by her ex-husband, and which were alleged to reveal her consciousness of guilt.[9] The meaning of the diary entries was considered to be within the jury's knowledge, and was not subject to expert evidence.[10] Folbigg maintained that each of the children died of natural causes. In the shadow of the now discredited *Meadow's Law*—according to which three sudden infant deaths in one family is "murder until proven otherwise"[11]—she was convicted of three counts of murder, one count of manslaughter, and one count of maliciously inflicting grievous bodily harm, and sentenced to forty years' imprisonment (which was reduced to thirty years subsequently). Her appeals to the Court of Appeal and the High Court, regarding the safety of her convictions, were dismissed.[12]

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[8] R v Folbigg (2005) 152 A Crim R 35.

[9] On the role of Craig Folbigg in the Folbigg case, see Emma Cunliffe, Murder, Medicine and Motherhood (2011).

[10] See Fiona Hum & Andrew Hemming, Lost in Translation: The Wrongful Conviction of Kathleen Folbigg Based on Fresh Medical Evidence and Expert Interpretation of Her Diaries, 97 Austl. L.J. 180 (2023).

[11] Id.

[12] Folbigg v The Queen [2007] NSWCCA 371; Folbigg v The Queen [2005] HCATrans 657.

Heralding the decisive role science and scientists would come to play in the Folbigg case, in 2012, concern about the forensic evidence adduced at trial led a forensic pathologist to request a coronial inquest into the deaths of the Folbigg children.[13] At around the same time, Kathleen Folbigg underwent genetic testing, and genetic testing was also conducted on her children using samples. It was found that Kathleen Folbigg and two of her children had a rare mutation in the CALM2 gene, which had already been linked to cardiac arrhythmias and sudden deaths.[14] In 2015, following a petition initiated by the University of Newcastle Legal Centre, and having marshalled significant support from leading medical experts around the world, Folbigg's representatives sought a review of the safety of her convictions.[15] A Special Commission of Inquiry headed by His Hon Reginald Blanch AM QC was held over 2018-19.[16] Part of the fresh evidence given at the Inquiry addressed the possibility that natural causes may have played roles in at least some of her children's deaths. The Inquiry concluded that new expert medical evidence about the genetic variation found in Kathleen Folbigg and two of her children did not raise a reasonable doubt about Folbigg's conviction. Indeed, Judge Blanch found that the new evidence reinforced Folbigg's guilt, concluding that smothering was the only conclusion reasonably open on the medical evidence, and that her diary entries were "virtual admissions of guilt."[17]

After this inquiry concluded, the question of whether there might be a biological cause of the deaths of the Folbigg children garnered only more attention. Folbigg's representatives applied for a review of the outcome of the inquiry, on the basis that the conclusions were at odds with the scientific evidence, but were unsuccessful.[18] At the same time, the genetic scientist Carola Vinuesa, who had identified the genetic mutation in Kathleen Folbigg, worked with colleagues to conduct further research to assist Folbigg's case.[19] Vinuesa and colleagues sequenced the full genomes of Kathleen Folbigg and the Folbigg children. While the fact that two of the Folbigg children had inherited Kathleen Folbigg's novel mutation in the CALM2 gene was already known, further research was required to determine if the variant was pathogenic.[20] Vinuesa and an international team conducted three studies and concluded that there was a 99 percent certainty that the mutation was

[13] See also New South Wales Department of Communities and Justice, Report of the Inquiry into the Convictions of Kathleen Megan Folbigg (2019).

[14] See Jarrah Aguera, Kathleen Folbigg Was Imprisoned over the Deaths of Her Four Children. Then, an ANU-led Breakthrough Uncovered the Medical Mystery Behind the Tragedy, ANU Rep., Dec. 14, 2023 (https://reporter.anu.edu.au/all-stories/genetics-truth-and-justice).

[15] The review was requested pursuant to s76 Crimes (Appeal and Review) Act 2001 (NSW).

[16] See New South Wales Department of Communities and Justice, supra note 13; Folbigg v Attorney General New South Wales (2021) 391 ALR 294.

[17] New South Wales Department of Communities and Justice, supra note 13, at [65].

[18] See Folbigg v Attorney General New South Wales (2021) 391 ALR 294.

[19] See John Travis, How a Geneticist Led an Effort to Free a Convicted Serial Murderer, 380 Science 1096 (2023).

[20] Id.

responsible for the deaths of two of the children.[21] These scientists, and others from around the world, signed a petition asking for Folbigg to be pardoned, and, at the same time, Folbigg's lawyers called for another coronial inquest into the deaths of the four children.[22]

Referencing "the rapid developments in genetic science in respect of the CALM2 genetic mutation" and, in 2022, ducking the demands for a pardon, the NSW Attorney-General ordered another special inquiry into Folbigg's convictions.[23] This Special Commission of Inquiry took place over 2022-2023 under the Hon Thomas Bathurst KC AC. The Inquiry attracted high levels of public and professional interest, including among scientists, with the Australian Academy of Science appointed as an independent scientific advisor to the inquiry, and two Danish researchers presenting unpublished research about the CALM2 genetic variant in person at the inquiry.[24] Other expert medical evidence was given by a pediatric neurologist and a SIDS expert.[25] During the hearings, the meaning of entries in Folbigg's diaries was subject to specialist commentary from seven different experts, spanning the fields of linguistics, psychiatry, psychotherapy, and psychology, with the evidence indicating that the diary entries were the thoughts of a grieving mother who felt responsible and blamed herself for the deaths of her children.[26] At the conclusion of the hearings, counsel for the Director of Public Prosecutions made the unusual move of acknowledging that reasonable doubt about the convictions existed. In his report, Judge Bathurst agreed, concluding that the genetic and other medical evidence suggested that three of the deaths were the results of natural causes, and that "the diaries do not contain reliable admission on the issue of guilt."[27] On June 5, 2023, Kathleen Folbigg was pardoned by the NSW Attorney-General, released from prison, and, in December 2023, her convictions were quashed by the NSW Court of Criminal Appeal.[28] Folbigg had served twenty years in prison.

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[21] See Malene Brohus et al., Infanticide vs. Inherited Cardiac Arrhythmias, 23 Europace 441 (2020). This article was referred to extensively in the Blanch inquiry report.

[22] See Robert Cavanagh, Petition to Governor for Pardon, Injustice Project, Mar. 2, 2021 (https://perma.cc/ULQ8-6YNX); Rachael Brown, Kathleen Folbigg's Lawyers Request Inquest into Deaths of Her Four Children, Australian Broadcasting Corporation, Mar. 5, 2022 (https://perma.cc/V4HS-CKRA). This petition was supported by the Australian Academy of Science.

[23] See Press Release, Attorney-General Mark Speakman, Kathleen Megan Folbigg, May 18, 2022 (https://perma.cc/Z28W-K9FM). The Attorney-General declined to recommend a pardon to the Governor on the basis that "only a transparent, public and fair inquiry can provide a just resolution" of the doubt raised by the new evidence.

[24] Australian Academy of Science, Academy Confirmed as Independent Scientific Adviser at Folbigg Inquiry, Sept. 6, 2022 (https://perma.cc/JD9W-Q35E); Michaela Whitbourn, Kathleen Folbigg's Daughters Likely to Have Died of Natural Causes, Inquiry Told, Sydney Morning Herald, Nov. 22, 2022 (https://perma.cc/V2YQ-SUBY).

[25] See New South Wales Department of Communities and Justice, supra note 13.

[26] Id. § 6; see also Hum & Hemming, supra note 10, at 192.

[27] New South Wales Department of Communities and Justice, supra note 13, at [1974]-[75], [1962].

[28] Press Release, Attorney-General Michael Daley, Kathleen Folbigg Pardoned, June 5, 2023 (https://perma.cc/E4BA-APW3); Folbigg v R [2023] NSWCCA 325. At the time of writing, Folbigg is pursuing a claim for compensation against the government of NSW.

In the fallout from what is now recognized as a major miscarriage of justice, attention has turned to what can be done in order to avoid such errors in the future. Reflecting preoccupation with the particular issue of the safety of criminal verdicts, to date, scholarly and public attention has been focused on reform of the rules and practices of evidence and procedure that govern the criminal process. Thus, a number of organizations have joined together to call for the introduction of a reliability standard for expert evidence, and the establishment, in NSW, of a post-appeal review organ, like the Criminal Cases Review Commission in the U.K.[29] Other responses have advocated for the creation of an expert scientific advisory body to inform courts in relevant cases.[30] The role of prosecutorial discretion—to proceed with a prosecution based on circumstantial evidence, and to try Folbigg for all four deaths together in one trial, for instance—has not received as much attention, but also seems to be a significant factor.[31] In support of these calls for reform, scholars and practitioners cite matters such as the limitations of the appeal process, the huge resources required to pursue injustices, and the inefficient and expensive nature of special inquiries.[32] As this list indicates, the issues identified concern the operation of the criminal legal system, and the fine-tuning needed to improve it.

The epistemic issues Folbigg's case raises extend far beyond fine-tuning, however. There are a number of ways in which this is the case, and here, I identify just three of them. First, the Folbigg case points up the new configurations of sites of knowledge production, and the complex interrelations of authority and expertise, that are a feature of the current context. A notable aspect of the Folbigg case is the involvement of different types of knowledge-holders, which included grass roots campaigners, a university innocence project, and an international community of scientists. Such groups intervene in and disrupt the standard criminal law binary of public prosecution and private defense. Further, in the Folbigg case, scientific knowledge production was thoroughly interwoven with the legal process rather than separate from it. In Folbigg, expert knowledge was advanced through criminal processes, and in the service of a specific legal outcome—Folbigg's exoneration. As mentioned above, scientists were on the defense team, the case provided genetic material and unexplained deaths on which to base scientific studies, and it generated a scientific-cum-advocacy community around Folbigg, at the same time as creating an audience—

[29] See, e.g., Media Release, NSW Bar Association, NSW Bar Association Welcomes the Release of Early Result of Inquiry into Convictions of Kathleen Folbigg, June 5, 2023 (https://perma.cc/2S7F-Y886). In the U.K., the convictions of Lucy Letby for the deaths of seven babies and the attempted murder of seven others, in her care as a nurse, currently the subject of a special inquiry led by Lady Justice Thirlwall, have also been questioned. See, e.g., Felicity Lawrence, Lucy Letby: Killer or Coincidence? Why Some Experts Question the Evidence, The Guardian, July 9, 2024 (https://perma.cc/4AEN-GN3G).

[30] Matthew Ward Agius, Can Justice Keep Up With Science?, Cosmos, Feb. 13, 2023 (https://perma.cc/39N4-LEY4).

[31] For a discussion of these issues, see Arlie Loughnan & Mike O'Connor, Monstrous Mothering: Understanding the Causes of and Responses to Infanticide, 30 J.L. & Med. 48 (2023).

[32] See David Hamer & Andrew Dyer, Australia Needs a Dedicated Body for Wrongful Convictions, Sydney Institute of Criminology, June 6, 2023 (https://perma.cc/8485-6WFM).

through the inquiries and public interest in them—for the research. As this shows, the dynamics of knowledge production and validation or confirmation of knowledge are marked by interdependence and complexity.

A second feature of contemporary knowledge conditions that the Folbigg case exposes concerns the status of moral-evaluative systems like criminal law, on the one hand, in relation to supposedly objective, conclusive, and value-neutral systems such as science, on the other. One of the narratives that is most prominent in the wake of Folbigg's exoneration is that it shows that criminal law and process need to "catch up" with science. Neatly summarizing this narrative, after her release from prison, Ms. Folbigg declared her pardon to be a "victory for science."[33] Media coverage of the case presents science—and the science of genetics in particular—as the savior of truth and justice.[34] A similar narrative is evident in commentary in academic journals.[35] This narrative has also been accompanied by calls (issued by scientists and lawyers) for greater scientific literacy on the part of criminal law, lawyers, and courts.[36] The Australian Academy of Science (AAS) issued a written statement calling for "a more science-sensitive legal system in every Australian jurisdiction so that miscarriages of justice are not repeated."[37] This "catch up" narrative depicts all the discretionary and evaluative issues as lying on one side—with the law, lawyers, and judges—rather than also with science, scientists, and expert witnesses, and misconstrues legal processes as mere venues for the display of scientific "truth," with their legitimacy pegged to scientific precision and currency.[38] I pick up this point below.

A third feature of wider knowledge conditions highlighted in the Folbigg case concerns changing relations *within* the domain of expert knowledge. It is notable that, in the story about savior science, the status of the expert knowledges enlisted in the (re)interpretation of Folbigg's diaries in the second inquiry—linguistics, psychiatry, psychotherapy, and psychology—is not clear-cut. While at trial the meaning of the diary entries was considered self-evident to the lay people comprising the jury, by the second inquiry, the meanings were depicted as hidden, requiring specialist interpretation and translation. By this point, that

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[33] Jordyn Beazley & Tamsin Rose, Kathleen Folbigg Says Her Freedom Is "a Victory for Science and Especially Truth," The Guardian, June 6, 2023 (https://perma.cc/96KN-6UZY).

[34] See, e.g., Sarah Treleavan, A Mother's Conviction, Reader's Digest, June 21, 2024 (https://perma.cc/B9YQ-NKW6).

[35] See, e.g., Peter J. Schwartz et al., Calmodulin, Sudden Death, and the Folbigg Case: Genes in Court, 45 Eur. Heart J. 1801 (2024).

[36] See University of New South Wales, Forensic Psychology, Law and the Folbigg Case: A Conversation with Professor Gary Edmond and Dr Sharmila Betts, Oct. 25, 2023 (https://perma.cc/BM5W-DZ4S); see also Jason Chin, What Can Law Take From Science After the Pardon of Kathleen Folbigg?, Law Soc'y J. (forthcoming).

[37] Australian Academy of Science, Scientists Call for Law Reform Following Release of Final Report into Kathleen Folbigg's Convictions, Nov. 8, 2023 (https://perma.cc/4KNA-C557).

[38] For a critical account of the evaluative issues on the science side, see Jasanoff, supra note 6; in relation to Folbigg, see also Chin, supra note 36.

inquiry even heard expert evidence about the nature of diaries as texts,[39] and the evidence echoed the conclusions Emma Cunliffe reaches in her analysis of the Folbigg trial—that the reading of the diaries that constructed Folbigg as a murderer of her children involved substituting the emotional exploration they contained for factual truth.[40] But undercutting the manifest meaning of the diaries seems to be depicted as somehow secondary, and less definitive, when compared with the genetic science. In contrast to the genetic studies, these knowledges do not seem to have the same claims to objectivity and truth, raising uncomfortable questions about the role of stereotypes and lay attitudes to women, motherhood, and violence at trial and in the first inquiry. I return to this point below.

The distinctive process of *ad hoc* special inquiries, and the rapid development of the science related to the CALM2 genetic variant, as well as the publicity the case received, make the Folbigg case unusual. But these aspects of the case act to distill the wider and more diffused currents which mark out the contemporary knowledge context. The value of this case study lies in the way in which it brings out larger questions about the epistemological setting in which the criminal law operates. How are knowledge claims validated? How is knowledge translated from one context to another? What can lay people be assumed to know? The answers to questions such as these are being radically rethought under changing knowledge conditions, and it is to this that I now turn.

II. Introducing *Hyper-Knowledge*

How should we think about changing knowledge conditions?[41] In order to capture what I suggest is the qualitatively different nature of conditions in the current era, I coin the term *hyper-knowledge*. Here, I present a conceptualization of *hyper-knowledge*, which has four dimensions: the massive expansion, increased complexity and dynamism of knowledges, and reduced trust in knowledge. These changes in criminal law-relevant knowledge are connected to each other, and form part of a larger and complex epistemological terrain marked by multifarious and intricate dynamics. For heuristic reasons, I separate them here and discuss each in turn.

Massive growth in the quantum of knowledges is the dimension of *hyper-knowledge* that has garnered the most attention among criminal law scholars to date. This attention has been largely focused on assessing the implications of developments in rapidly advancing fields of cognitive science like neuroscience for the criminal law ("neurolaw"). Taken broadly, the cognitive sciences seek to explain individual action through a focus on the interaction of the brain and the environment.[42] Arguments about the relevance of the

[39] See New South Wales Department of Communities and Justice, supra note 13.

[40] See Emma Cunliffe, (This Is Not a) Story: Using Court Records to Explore Judicial Narratives in R v Kathleen Folbigg, 27 Austl. Feminist L.J. 71 (2007).

[41] This subsection extends a discussion in Loughnan, supra note 7.

[42] See Gerben Meynen, Forensic Psychiatry and Neurolaw: Description, Developments, and Debates, 65 Int'l J.L. & Psychiatry 101345 (2019) (https://doi.org/10.1016/j.ijlp.2018.04.005).

cognitive sciences to law have weaker and stronger versions, but, in general terms, advances in these brain sciences—the so-called science of antisocial behavior—are said to provide objective or provable bases for matters such as diminished responsibility, sentencing (mitigation and aggravation), fitness to plead, and the age of criminal responsibility.[43] In addition, as the Folbigg case shows, and beyond the cognitive sciences, other "hard" sciences bear on criminal law practices, and there have been major developments in fields such as genetics and allied fields such as DNA.[44]

If neuroscience has attracted most of the attention given to growth in knowledge to date, then digital or technological knowledges seem set to challenge that singular focus. This new knowledge frontier includes machine learning and generative artificial intelligence (GenAI), and its implications are still emergent.[45] The criminal legal attention given to these developments has focused on the implications for criminal justice processes, such as policing, detection, and judging, as well as practices of risk assessment relevant to probation and parole.[46] But more broadly, the ramifications of the rise of technical knowledges for evaluative systems like criminal law are still largely unknown. What is evident is that technological knowledges have a radical and diffused impact on the epistemic framework of the criminal law; while these knowledges have an instrumental dimension (as they are understood as tools that perform certain tasks), they also have distinct regulative dimensions associated with specific values such as managerialism, efficiency, effectiveness, and accountability.[47] The increased influence of these values seems likely to profoundly impact criminal law decision-making, as I discuss below.

Massive growth in knowledges does not just extend the boundaries of human understanding. This growth in the quantum of knowledge throws open the status of knowledges. As knowledge scholars suggest, science and technology are no longer defined

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[43] For an overview, see Jennifer A. Chandler et al., Neurolaw Today: A Systematic Review of the Recent Law and Neuroscience Literature, 65 Int'l J.L. & Psychiatry 101341 (2019) (https://doi.org/10.1016/j.ijlp.2018.04.002).

[44] For discussion in relation to law, see Laura A. Baker et al., Behavioral Genetics: The Science of Antisocial Behavior, 69 Law & Contemp. Probs. 7 (2006); Benjamin Y. Cheung & Steven J. Heine, The Double-Edged Sword of Genetic Accounts of Criminality: Causal Attributions from Genetic Ascriptions Affect Legal Decision Making, 41 Personality & Soc. Psych. Bull. 1723 (2015). These knowledges also create new frontiers in social, personal, and governmental responsibility for future risk. See Silke Schicktanz, Genetic Risk and Responsibility: Reflections on a Complex Relationship 21 J. Risk Rsch. 236 (2018).

[45] For a general discussion of some of these implications, see Azeem Azhar, Exponential: Order and Chaos in an Age of Accelerating Technology (2021).

[46] See, e.g., Bart Custers, AI in Criminal Law: An Overview of AI Applications in Substantive and Procedural Criminal Law, in Law and Artificial Intelligence: Regulating AI and Applying AI in Practice 205 (Bart Custers & Eduard Fosch-Villaronga eds., 2022); Athina Sachoulidou, Algorithmic Criminal Justice: Is It Just a Science Fiction Plot Idea?, in Artificial Intelligence and Normative Challenges: International and Comparative Legal Perspectives 125 (Angelos Kornilakis et al. eds., 2023).

[47] See, e.g., Francesco Contini, From the Rule of Law to the Rule of Technology? The Institutional Implications of the Digital Transformation of Courts, in Research Handbook on Judging and the Judiciary (Sophie Turenne & Mohamed Moussa eds., forthcoming 2025).

entities, but undergoing a merging to form "technoscience."[48] From the vantage point of the criminal law, the rise of technical knowledges casts other knowledge from human decision-making—in the criminal law context, by experts, juries, and judges—in new (and potentially suspect) light, effectively constructing a new type of knowledge—non-AI knowledge or human-made knowledge. For example, the rise of algorithmic knowledges alters the status, and possibly the value, of expert knowledges that are based on professional or clinical assessment of individuals, such as psychological and psychiatric knowledges. As the Folbigg case suggests, rather than represent objective conclusions about individuals measured against discipline-based norms, these knowledges are posited as subjective, in that they are based on individualized assessment (e.g., of a client, assessed against diagnostic criteria). Thus, in relation to risk assessment in use in criminal law but also elsewhere, the availability of algorithmic knowledges both encodes and exacerbates a demand to overcome subjective assessments with "objective" data.[49]

The second dimension of *hyper-knowledge*—increased complexity of knowledge—is closely linked to growth in knowledge. Greater complexity of knowledge is itself complex, and connected to matters such as the organization of disciplines, the nature of interdisciplinarity, and the structure of professions. Turning to developments in social-scientific knowledge to make this point, recent decades have seen major developments in sociological, criminological, anthropological, and other knowledges that are informed by empirical studies into the effects of violence, victimization, abuse, addiction, and other matters on individuals and communities.[50] These studies span the full range of issues in contemporary criminal law and justice. Although rarely acknowledged in an aggregated way, these knowledges are having a decisive impact on legal understandings of criminal conduct, criminogenic factors, desistance, and related matters.[51] Some of these social-scientific knowledges cluster around the idea of trauma: broadly, the idea that exposure to adverse experiences, particularly early in life, has life-changing impacts, including on psychological capacities, self-awareness, decision-making, integration of the self, and physical health.[52] While the origins of trauma studies are in the field of psychiatry (and relate to clinical conditions like PTSD), it is notable that trauma has come to have a clear interdisciplinary cast,

[48] See Shiju Sam Varughese, Transitions in the Organisation of Knowledge in Practising Interdisciplinarity 41-60, 54 (2024).

[49] See Piers Gooding & Yvette Maker, The Digital Turn in Mental Health and Disability Law: Actuarial Traditions and AI Futures of Risk Assessment from a Human Rights Perspective, in The Future of Mental Health, Disability and Criminal Law 249 (Kay Wilson et al. eds., 2023). DNA also bears on addiction.

[50] For critical discussion, see Gary Edmond, Thick Decisions: Expertise, Advocacy and Reasonableness in the Federal Court of Australia, 74 Oceania 190 (2004); Robert van Krieken, Law's Autonomy in Action: Anthropology and History in Court, 15 Soc. & Legal Stud. 574 (2006).

[51] A ready if not recent example is the "broken windows" theory of policing. See James Q. Wilson & George L. Kelling, Broken Windows, The Atlantic, Mar. 1982 (https://perma.cc/86Y4-WQL5).

[52] This is an enormous field. See, e.g., Derek Bolton et al., Long-term Effects of Psychological Trauma on Psychosocial Functioning, 45 J. Child Psych. & Psychiatry 1007 (2004).

as the significance of the relationship between the individual, community, and their environment has come into sharper focus.[53]

The implications of increased complexity of knowledge are manifold. For example, increased complexity in the contemporary knowledge context shakes up the boundary between legal and extra-legal knowledges, what may be assumed and what must be proved, and by whom. As matters of specialist or exclusive knowledge gradually come to be understood and accepted by non-experts, the boundary between expert knowledge and lay knowledge shifts. This is significant for the criminal law because it impacts what a jury (the quintessential organ of lay knowledge) can be assumed to know, on the one hand, and what may be the subject of expert evidence, on the other.[54] And the movement may go in the other direction. As the Folbigg case demonstrates, from the time of the trial and through the first inquiry, to the second inquiry, the "plain" meaning of personal diary entries—as factual truth—became a matter of hidden meaning and specialist knowledge—as psychologically complex and multivalent thoughts and reflections. As this suggests, part of the complexity in the knowledge conditions for criminal law relates to the ways in which knowledges are reconstructed—as lay or ordinary knowledge, or matters of specialist knowledge and exclusivity.

Further, part of the complexity arising in contemporary knowledge domains relates to changed understandings of human subjectivity and agency. As a number of scholars note, a particular construction of the legal subject—characterized by autonomy, rationality, and agency—is a feature of the modern criminal law.[55] Developing knowledges have the potential to undercut the normative view of the legal subject encoded in the criminal law. These knowledges challenge the legal subject in that the substantive content of some new knowledges—in which individual brains are recognized as being altered by trauma and in which racism and disadvantage can be seen to have profound psychological as well as structural effects, for instance—undermines, or has the potential to undermine, the traditional legal construction of subjectivity. Put another way, the normative commitment to the rational, autonomous, and agentic legal subject may be threatened by the increasing implausibility of this idea as a matter of description. Extant structures for containing these disruptive knowledges—in the space of mental incapacity in criminal law, or in post-conviction—seem to be increasingly porous.

In this respect, it is possible to see a difference between the current period and an earlier period that also saw massive change in knowledge conditions. From the end of the eighteenth century, and over the nineteenth century, the content of knowledge and its organization underwent a seismic change. Reflecting the long legacy of the Enlightenment, this period was marked by the restructuring of knowledge, leading to its increasingly formal

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[53] See Karen Menzies, Understanding the Australian Aboriginal Experience of Collective, Historical and Intergenerational Trauma, 62 Int'l Soc. Work 1522 (2019).

[54] In general terms, expert evidence is an exception to the prohibition on opinion evidence; in the Australian context, see Uniform Evidence Act (Cth).

[55] See Lindsay Farmer, Making the Modern Criminal Law: Criminalization and Civil Order (2016).

organization, a restructuring that was prompted by a perceived need for knowledge to be "systematic, professional, useful and co-operative."[56] This change produced the types of knowledge that would be closely associated with the political, social, and cultural changes going together under the label of modernity, and the now-familiar organization of knowledge in disciplines.[57] These changes in knowledge conditions, which made the world anew for the bourgeois class, had a decisive impact on criminal law. As Lacey argues, it was the rise of psychologized understandings of the self that made the factualization of *mens rea* possible, meaning that criminal responsibility "could be explicated in legal, technical terms, and hence legitimated as a form of specialist knowledge underpinning an impersonal mode of judgment."[58] But, in the current era, new knowledges do not seem to dovetail with moral-evaluative legal knowledge, but rather to run against it, as I discuss below.[59]

The third dimension of *hyper-knowledge* is the dynamism or churn that results from growth in the quantum of knowledges and the increased complexity of knowledge. Dynamism or churn emphasizes the contingency and instability of knowledge, and the associated effects on social, political, economic, and other relations. As Stehr argues in relation to the development of "knowledge societies," "the growth and the broader dissemination of knowledge paradoxically produces greater uncertainty and contingency rather than a resolution of disagreements or the basis for a more effective domination by central societal institutions."[60] Putting it differently, Stehr refers to

> [t]he growth of knowledge and the growing societal importance of knowledge forces society to confront at least dual contingencies . . . . There is (1), the contingency of knowledge itself and (2), the heightened contingency of social relations as the result of the growing penetration of knowledge into society.[61]

Criminal law is one of the "central societal institutions" impacted by these changes. In particular, closure and finality in legal processes may be undercut by the contingency and instability of knowledge, as I discuss below. In addition, and overlaid onto this dynamism or churn, is public perception about exponential change in knowledge conditions, fed by matters such as the speed at which scientific developments in the high-profile Folbigg case came to cast doubt on the safety of Folbigg's convictions. In this way, the rapidity of scientific and other developments places a question mark above what is currently accepted

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[56] See Peter Burke, A Social History of Knowledge: From Gutenberg to Diderot 46 (2000).

[57] See generally Nikolas Rose, Medicine, History and the Present, in Reassessing Foucault: Power, Medicine and the Body 48 (Colin Jones & Roy Porter eds., 1994).

[58] See Nicola Lacey, Responsibility and Modernity in Criminal Law, 9 J. Pol. Phil. 249, 267-68 (2001).

[59] There was already a tussle about this around medical evidence in the early nineteenth century. See generally Joel Eigen, Witnessing Insanity: Madness and Mad-Doctors in the English Court (1995); Arlie Loughnan, Manifest Madness: Mental Incapacity in Criminal Law (2012); Roger Smith, Trial by Medicine: Insanity and Responsibility in Victorian Trials (1984).

[60] Stehr, Knowledge Capitalism, supra note 5, at 277; see generally Stehr, Knowledge Societies, supra note 5.

[61] Stehr, Knowledge Capitalism, supra note 5, at 287.

wisdom, exposing the partiality of knowledge and contingency of practices like adjudication and evaluation which depend on it.

The fourth dimension of *hyper-knowledge* is perhaps the most significant: reduced trust in knowledge and knowledge-holders. This phenomenon is also complex: it features excessive or misplaced trust in certain types of knowledge or certain knowers. Reduced trust in knowledge and knowledge-holders is part of a wider and more complex shift that has taken place over the twentieth century, as modernity has given way to late, second, or advanced modernity.[62] This is a seismic shift through which relations between individuals and the state have been radically reconstructed, as declining faith in political institutions, and rising perceptions of insecurity, have led to a recalibration of politics and identities.[63] Like the other dimensions of *hyper-knowledge*, reduced trust in knowledge and knowledge-holders impacts criminal law-relevant knowledge, but also goes much further. As Stehr argues in relation to scientific knowledge, "[t]he social construction of scientific claims to knowledge . . . strongly attributes a contingency to knowledge. . . . As a result, the harnessing of knowledge [is] accompanied not only by continuing concerns about past threats that are persistent fears . . . but by a decline in the authority of experts and growing skepticism toward the possibility of disinterested expertise."[64] Overlaid onto these developments is the more recent advent of the specter of post-truth, a nebulous notion that evokes an idea of crisis in shared understandings that underpin social practices including criminal legal decision-making.[65]

Running under each of these four dimensions of *hyper-knowledge* is the changed economic organization of knowledge production, dissemination, and consumption. Once again, the criminal-law relevant dimension of this development is but a part of change across a much larger and complex epistemological terrain. The presence of for-profit actors in knowledge production (e.g., DNA sequencing) is making new knowledge available at the same time as the data is owned by private companies. The dominance of big tech companies like Meta, the rise of social media, and the declining influence of public broadcasting are having profound impacts on the dissemination of knowledge, with new actors making claims to authority and expertise that are validated in new ways (via downloads and "likes"). At the same time, the existence of paywalls and other impediments limiting access to scientific and other research distorts the consumption of knowledge across communities. As critical social science research on phenomena such as the filter bubble, platform capitalism,

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[62] On modernity and late modernity (or reflexive modernity), see Ulrich Beck, Risk Society: Towards a New Modernity (1992); Anthony Giddens, The Consequences of Modernity (1990); Anthony Giddens, Modernity and Self-Identity: Self and Society in the Late Modern Age (1991).

[63] See, e.g., Ulrich Beck & Elisabeth Beck-Gernsheim, Individualization Institutionalized: Individualism and Its Social and Political Consequences (2001).

[64] See Stehr, Knowledge Capitalism, supra note 5, at 288.

[65] For consideration of the implications of this for law, see Luke Mason, Idealism, Empiricism, Pluralism, Law: Legal Truth After Modernity, in Post-Truth, Philosophy and Law 93 (Angela Condello & Tiziana Andina eds., 2019).

and data surveillance indicates, these developments do not represent the democratization of knowledge, but rather new configurations of neoliberal market and labor relations.[66] The changed economic organization of knowledge impacts criminal law, giving issues of access to knowledge and understanding of its claims to authority and truth (on the part of the public, but also legal actors) a particular inflection now.

III. Implications for the Legitimation of Criminal Law

Hyper-knowledge alters the legitimation needs of the criminal law. Following Scott Veitch, legal legitimation may be understood as "law's claim to correctness, force, and social priority."[67] As mentioned above, Lacey identifies legitimation as one of the two problems of criminal law in democratic systems which drive the development of the law. As Lacey argues, legitimation concerns the ways in which criminal law generates a narrative that authorizes its power.[68] Thus, for Lacey, criminal responsibility serves a coordinating and legitimating function, providing a symbolic resource for the criminal legal system, enabling it to be regarded as a system of justice, rather than one of sheer force.[69] In what ways do changing knowledge conditions alter the legitimation needs of the criminal law? I suggest that they generate a demand for greater reflexivity in practices such as evaluation and adjudication, and a reconstruction of the bases on which the law itself has coherence and social standing. To give a sense of this, here, I identify four aspects of this impact on legitimation.

First, one of the ways in which *hyper-knowledge* alters the legitimation needs of the criminal law concerns the authority of legal professionals such as lawyers and judges, and lay people who form juries, in criminal trials. Growth in the quantum of knowledge, and increased complexity of the interaction between knowledges, makes the task of knowledge coordination necessary for criminal law evaluation and adjudication more difficult. This is not merely a matter of lay, professional, and judicial understanding of such knowledges, but also understanding the interaction between expert claims, and the authority of criminal legal institutions (like prosecution agencies and appeal courts) to evaluate and decide between them. Indeed, reliance on special inquiries in cases such as Folbigg hints that even the adversarial system as an acceptable method of legal dispute resolution comes into question. In this light, the calls for scientific advisory organs following Folbigg's exoneration are not benign. The full implications of the Folbigg narrative that emerged about the criminal law needing to "catch up" with science are radical: this narrative generates a need to legitimize

[66] There is an enormous literate here. See, e.g., Nick Couldry & Ulises Ali Mejias, The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism (2019); Nick Srnicek & Laurent de Sutter, Platform Capitalism (2017); Shoshana Zuboff, The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power (2019).

[67] See Scott Veitch, Law and Irresponsibility 97 (2007).

[68] See Lacey, supra note 2, at 252.

[69] Lacey, supra note 3, at 19-20.

criminal law and legal decision-making differently, demanding a reconsideration of the status of moral-legal evaluation in the wider epistemological setting marked by more salient demands for the "objectivity" and "truth" provided by technoscience.

Second, the dynamism and churn in knowledge identified above as one of the dimensions of *hyper-knowledge* introduces a contingency into criminal law decision-making which is in tension with legal systemic orientation to closure and finality. Rapid developments in expert knowledge domains like science risk rendering legal adjudication and evaluation engaging such knowledges provisional or tentative, pending "definitive" proof provided by ever more perfect methods and findings. As the Folbigg case illustrates, such dynamism in knowledge fields does not fit easily into the criminal legal structure of trial and (limited) appeals, with closure in that case provided only by two independent (and costly) public inquiries and the extra-curial process of exoneration. This hints at the need for greater agility and flexibility in criminal legal institutions and processes, and, beyond this, demands more "joined up thinking" to connect "downstream" processes such as parole which, as a more bureaucratic and less public criminal practice, has been legitimated in different ways.

Third, another way in which *hyper-knowledge* alters the legitimation needs of the criminal law relates to the construction of legal subjectivity. As discussed above, developments in social-scientific knowledges are radically reconstructing understandings of selfhood, in ways that bear on criminal law practices like responsibility attribution directly. The construction of the legal subject—as autonomous, rational, and agentic—serves a legitimation purpose in the criminal law. As Ngaire Naffine writes, treating individuals as rational and agentic in systems such as that of criminal law has an "ennobling" effect,[70] and in Alan Norrie's words, the reasoning individual has become a "powerful mechanism of ideological legitimation" for the criminal law.[71] In the current era, ideas about the legal subject are not just independent of insights derived from the social sciences—about complex trauma, cumulative disadvantage, colonization, and intersectionality etc.—but up *against* these learnings. In particular, what Norrie has referred to as "psychological individualism," shared by criminal law and psychology,[72] may be under threat from new knowledges that expose the connections between structural disadvantage and criminality. Further, the position of being up against an ever-growing body of extra-legal knowledges does not just undermine the legitimation of practices like responsibility attribution, but creates pressure to reconstruct them, perhaps in ways that enhance the reflexivity of legal decision-making.

Fourth, these same knowledges that threaten the construction of the legal subject also threaten to expose the multiple negative effects of the operation of criminal law systems. As Lacey and colleagues suggest, one of the ways criminal law is legitimated concerns "the instrumental conception," that is, "the widespread belief in the instrumental efficacy

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[70] See Ngaire Naffine, In Defence of the Responsible Subject, 34 Austl. J. Legal Phil. 222, 227 (2009).

[71] See Alan Norrie, Crime, Reason and History 176 (2001).

[72] Id.

of and necessity for the criminal law."[73] But this does not actually accord with empirical evidence that "the reductive effects of criminal processes are meagre."[74] As a result of transnational social movements like #BlackLivesMatter, the criminogenic effects of incarceration and the over-representation of marginalized individuals in the criminal system are more widely known than ever. At the same time, movements such as #MeToo have exposed the severe limitations of legal solutions to problems of violence against women. This seems to be a perfect storm: the ways in which certain "wicked" problems like gender violence both demand and resist solution through the criminal law seem to push in the direction of reconstruction of the law—perhaps around prevention of crime or restricted to a more symbolic function of condemnation—in order to retain (or attain) coherence and social standing.

There are other effects on legitimation of the change in knowledge conditions unfolding in the current era. These effects are likely to vary across the criminal law terrain, as, for instance, the role of expert knowledge and evidence varies from one part of criminal law to another. For example, the role of knowledges in cases of interpersonal violence is likely to be different from the role of (a different mix of) knowledges in a fraud matter. There is also something to be said about the ways power and inequality might make knowledge coordination and legitimation work in different ways. For example, in the current climate of reduced social tolerance for sexual violence, evident in Australia and elsewhere, while the status of victim-survivor testimony is changing (perhaps in ways that correct the epistemic injustice of earlier periods), the role of prosecutors in committing matters to trial and adducing evidence to found a conviction, has been politicized.[75] In addition, discussion of the knowledge coordination and legitimation challenges faced by criminal law raises questions about ignorance, which we might think of as in a dynamic relationship with knowledge. There is now an extensive literature on the sociology of ignorance related to the sociology of organizations.[76] The role of ignorance in criminal law seems relevant to knowledge coordination in matters such as prosecutions for historical offenses, in which questions about what was known at the time of the offending (by individuals and institutions such as schools and children's homes) loom large, while questions about what can be known and proved in the current era, at the time of the trial, may raise concerns about justice, fairness, and the rule of law. These and other issues suggest that

[73] See Celia Wells & Oliver Quick, Lacey, Wells and Quick, Reconstructing Criminal Law 11 (4th ed. 2010).

[74] Id.

[75] On epistemic injustice, see Jan Bublitz, When Is Disbelief Epistemic Injustice? Criminal Procedure, Recovered Memories, and Deformations of the Epistemic Subject, 18 Crim. L. & Phil. 681 (2024). The matter of prosecutorial discretion is live in NSW after a number of senior judges commented on "unmeritorious" cases being brought to trial by the Office of the Director of Public Prosecutions, Ms. Sally Dowling SC. See Nick Dole, NSW director of public prosecutions orders review of every sexual assault case committed for trial following criticism from judges, ABC News Online, Mar. 7, 2024 (https://perma.cc/3K5H-ZVNG).

[76] See, e.g., Robert van Krieken, The Organization of Ignorance: The Australian "Robodebt" Affair, Bureaucracy, Law and Politics, 50 Critical Socio. 1379 (2024) (https://doi.org/10.1177/08969205241245257).

there is a need for further thinking about the implications of *hyper-knowledge* for the legitimation of the criminal law.

IV. Conclusion

This paper assessed the massive changes in criminal law-relevant knowledge unfolding in the current era. As the case study of Kathleen Folbigg's case illustrates, the issues arising from contemporary knowledge conditions extend beyond current concerns with rules and practices of evidence and proof. Changes in knowledge conditions need to be assessed together, with an inquiry that recognizes the foundational role such conditions play in the criminal legal order. In order to capture the qualitative nature of these changing knowledge conditions, I offered a conceptualization of current conditions as *hyper-knowledge*. In my schema, there are four dimensions of *hyper-knowledge*—increased quantum, greater complexity, enhanced dynamism, and reduced trust. *Hyper-knowledge* constitutes new knowledge conditions for the criminal law, with implications across the spectrum of criminal law decision-making, from law-making to policy development, as well as sentencing, parole, and other penal system practices. These new conditions demand the reconstruction of legitimation needs of criminal law, as criminal law decision-making will demand greater reflexivity, and a fundamental reconstruction of the bases on which the law itself has coherence and social standing.

This paper sought to contribute to the discussions, developed across contributions to this Special Issue, about whether, and how, to reconstruct criminal law (and its associated institutional forms, including the trial and prison) in progressive ways. As this Special Issue asks, amid a resurgence of interest in abolitionism, is there still space for a scholarship focused on critique oriented to reconstruction rather than abolition? And what are the conditions of existence of such reconstructive projects across both different areas of criminal law and practice and different jurisdictions? One of the conditions of existence for a reconstructed criminal law is legitimation in the context of changing knowledge conditions. In this context, *hyper-knowledge* must be recognized as likely to have a profound impact on present and future criminal law.