ADDRESSING 'LOSS OF IDENTITY' IN THE JOINT JUDGMENT: SEARCHING FOR 'THE INDIVIDUAL JUDGE' IN THE JOINT JUDGMENTS OF THE MASON COURT

ANDISHEH PARTOVI,* RUSSELL SMYTH,** INGRID ZUKERMAN*** AND JOSEPH VALENTE****

I INTRODUCTION

There has been a spate of recent articles by current, and former, judges in Australia debating the relative merits of joint and separate judgments.[1] One of the arguments against joint judgments is that they entail the loss of individual voice and due recognition for the development of the law. As Justice Kiefel puts it:

> It must be frankly acknowledged that some judges may feel a sense of loss when a judgment they have written is published under the names of all the other judges who have agreed with it, but may not have contributed substantially to it. A judge's loss of identity as author may be exacerbated on occasions when commentators guess, often wrongly, about authorship. A judge whose judgments are more often than not agreed in by his or her colleagues will not necessarily achieve the recognition or reputation of other judges. This may result in a misconception about influence.[2]

One imagines that for a judge sitting in a final appeal court who authors a joint judgment, or a substantial component thereof, the sense of loss of due recognition would be felt strongest when: (a) there is a high proportion of joint

* Research Fellow, Faculty of Information Technology, Monash University.
** Professor, Department of Economics and Deputy Dean (Academic Resourcing), Monash Business School, Monash University.
*** Professor, Faculty of Information Technology, Monash University
**** Co-Founder and CEO, Ebla <http://www.ebla.com>.
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1 See, eg, Justice Dyson Heydon, 'Threats to Judicial Independence: The Enemy Within' (2013) 129 *Law Quarterly Review* 205; Sir Anthony Mason, 'Reflections on the High Court: Its Judges and Judgments' (2013) 37 *Australian Bar Review* 102; Peter Heerey, 'The Judicial Herd: Seduced by Suave Glittering Phrases?' (2013) 87 *Australian Law Journal* 460; Justice Stephen Gageler, 'Why Write Judgments?' (2014) 36 *Sydney Law Review* 189; Justice Susan Kiefel, 'The Individual Judge' (2014) 88 *Australian Law Journal* 554. For a summary of the alternative views expressed in these offerings see Andrew Lynch, 'Keep Your Distance: Independence, Individualism and Decision-Making on Multi-Member Courts' in Rebecca Ananian-Welsh and Jonathan Crowe (eds), *Judicial Independence in Australia – Contemporary Challenges, Future Directions* (Federation Press, 2016) 156.

2 See Kiefel, above n 1, 557.

judgments (leading to a 'loss of identity'); and (b) there are significant landmark cases being decided that substantially influence the development of the common law.

As Justice Kiefel points out, a judge's sense of 'loss of identity' is likely exacerbated when commentators speculate about the authorship of joint judgments, but get it wrong. We address this issue through the use of computational linguistics to explore authorship of the joint judgments of the Mason Court.[3] In so doing, we go beyond mere speculation about the authorship of landmark joint judgments, and provide predictions about authorship that are based on sound methods.

The Mason Court was a period in which both (a) and (b) above were satisfied. There was historically a high proportion of joint judgments,[4] and it was a period in which significant landmark cases were decided. The influence of the Mason Court is arguably unmatched in Australian judicial history. The relatively stable makeup of the Court,[5] its strengthened authority following the passage of the Australia Acts,[6] and the increasing internationalisation of the Australian economy allowed the Court to exert an unprecedented level of influence over the Australian law.[7] Jason Pierce has suggested that the Mason Court represented a transformation on the High Court.[8] Former Attorney-General, Michael Lavarch, described this period as follows:

> The eight years during which Sir Anthony Mason was Chief Justice of the High Court rank among the most exciting and important in the Court's history. During that period the Court made many significant changes to Australian law. I think it is not overstating the position to say that these changes affected some of the most basic legal doctrines and relationships. They affected the way we view our history. They affected the way we view our place in the world.[9]

The Mason Court has had a lasting legacy. As Andrew Lynch puts it, in his review of Pierce's book:[10] 'The Mason Court may have formally ended, but it is

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3 Throughout we use the term 'Mason Court' as a convenient shorthand to refer to the period from 6 February 1987 to 20 April 1995, in which Sir Anthony Mason was Chief Justice of the High Court.

4 See Matthew Groves and Russell Smyth, 'A Century of Judicial Style: Changing Patterns in Judgment Writing on the High Court 1903–2001' (2004) 32 *Federal Law Review* 255, 267 Figure 2; Andrew Lynch, 'Does the High Court Disagree More in Constitutional Cases? A Statistical Study of Judgment Delivery 1981–2003' (2005) 33 *Federal Law Review* 485, 497–500.

5 The only change to the composition of the Mason Court was the retirement of Wilson J, and appointment of McHugh J, in February 1989 – see Michelle Dillon and John Doyle, 'Mason Court' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 461, 461.

6 *Australia Act 1986* (Cth); *Australia Act 1986* (UK).

7 Cheryl Saunders, 'The Mason Court in Context' in Cheryl Saunders (ed), *Courts of Final Jurisdiction: The Mason Court in Australia* (Federation Press, 1996) 2; Dillon and Doyle, above n 5, 461; Justice Michael Kirby, 'Sir Anthony Mason Lecture 1996: A F Mason – From *Trigwell* to *Teoh*' (1996) 20 *Melbourne University Law Review* 1087; Paul Kildea and George Williams, 'The Mason Court' in Rosalind Dixon and George Williams (eds), *The High Court, the Constitution and Australian Politics* (Cambridge University Press, 2015) 244.

8 Jason L Pierce, *Inside the Mason Court Revolution: The High Court of Australia Transformed* (Carolina Academic Press, 2006) 4–24.

9 Michael Lavarch, 'The Court, the Parliament and the Executive' in Cheryl Saunders (ed), *Courts of Final Jurisdiction: The Mason Court in Australia* (Federation Press, 1996) 15, 15.

10 See Pierce, above n 8.

not simply "over". It has, as amply demonstrated by Pierce, retained a remarkably strong presence in the minds of the judiciary and legal profession as well as the legal academy'.[11] That the Mason Court has had an enduring influence on the development of what The Hon Michael McHugh terms a 'new and distinctive Australian jurisprudence',[12] heightens interest in who wrote the leading joint judgments of the period. Commentators have speculated on who wrote some of the leading joint judgments of the Mason Court, and the judges themselves have offered oblique hints. Sir Gerard Brennan states 'it is easy to identify the most important parts [of *Cole v Whitfield*[13]] as flowing from [Sir Anthony Mason's] pen'.[14] There is, however, a lack of hard empirical evidence regarding this point.[15] Yet, for reasons that we outline in more detail in the next section, attribution matters. As the quotation from Justice Kiefel above highlights, at its most basic level, attribution is important to the individual, in establishing reputation and for the simple pleasure of being acknowledged.[16] 'More generally it might be said that there should be no secrecy about authorship'.[17]

II WHY DOES ATTRIBUTION OF AUTHORSHIP IN JOINT JUDGMENTS MATTER?

A notable rationale in favour of attribution, typically advanced by American scholars, is the need for accountability on the part of judges. As United States Supreme Court Justice Ruth Bader Ginsburg quotes: 'When anonymity of pronouncement is combined with security in office, it is all too easy for the politically insulated officials to lapse into arrogant *ipse dixits*'.[18] Such a strong formulation of this point is probably unique to the American legal environment,

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11 Andrew Lynch, 'The Once and Future Court? A Review of Jason L Pierce, *Inside the Mason Court Revolution: The High Court of Australia Transformed* (Carolina Academic Press, 2006)' (2007) 35 *Federal Law Review* 145, 146.

12 Michael McHugh, 'The Constitutional Jurisprudence of the High Court: 1989–2004' (2008) 30 *Sydney Law Review* 5, 11.

13 (1988) 165 CLR 360.

14 Sir Gerard Brennan, 'A Tribute to Sir Anthony Mason' in Cheryl Saunders (ed), *Courts of Final Jurisdiction: The Mason Court in Australia* (Federation Press, 1996) 10, 13. See also Katy Barnett, 'Sir Anthony Mason Reflects on Judging in Australia and Hong Kong, Precedent and Judgment Writing' on Melbourne Law School, *Opinions on High* (28 July 2014) <http://blogs.unimelb.edu.au/opinions onhigh/2014/07/28/barnett-mason/> where Sir Anthony Mason states he 'made a greater contribution to' *Cole v Whitfield* (1988) 165 CLR 360 than the other landmark case of his chief justiceship; namely, *Mabo v Queensland [No 2]* (1992) 175 CLR 1.

15 For speculation about high-profile unsigned opinions in the United States Supreme Court such as the *Obamacare* decision by the Roberts Court [*National Federation of Independent Business v Sebelius* 132 S Ct 2566 (2011)] see William Li et al, 'Using Algorithmic Attribution Techniques to Determine Authorship in Unsigned Judicial Opinions' (2013) 16 *Stanford Technology Law Review* 503, 511–14.

16 Catherine L Fisk, 'Credit Where it's Due: The Law and Norms of Attribution' (2006) 95 *Georgetown Law Journal* 49, 50.

17 See Kiefel, above n 1, 557.

18 Ruth Bader Ginsburg, 'Remarks on Writing Separately' (1990) 65 *Washington Law Review* 133, 139 quoting Maurice Kelman, 'The Forked Path of Dissent' [1985] *Supreme Court Review* 227, 242.

in which some judges are elected, the federal judicial nomination process is highly politicised, and there is a Constitutional Bill of Rights and no mandatory retirement age. That the Federal Judiciary is more politicised, and has life tenure, means that the public's desire to hold judges accountable for how they decide cases is probably greater than in Australia. However, undeniably, many Australians would certainly sympathise with the underlying idea that there ought to be some visibility over who authors the decisions of the High Court, which have such a lasting effect on the everyday lives of the populace. This is particularly true of a period of rapid change in the law, such as that which occurred during the period when Sir Anthony Mason was Chief Justice.

Andrew Lo suggests that: 'Obscuring authorship removes the sense of judicial accountability, making it harder for experts and the public alike to understand how important issues were resolved and the reasoning that led to these decisions'.[19] Knowledge of authorship can offer insights into how a decision was made. It is likely that the (primary) author of a judgment has played a key role in persuading the other judges sitting on the case through circulating his or her reasons. For instance, when Sir Owen Dixon was Chief Justice, Sir Douglas Menzies writes that when the Chief Justice 'was concerned that a decision should go in a particular way, his aim was to get his own judgment out first for circulation to other members of the Court. To differ from him was a course always taken with hesitation and never without foreboding'.[20] Judges who write the bulk of joint judgments in particular areas of the law can greatly influence the evolution of judicial reasoning in that area. In the United States, Judges Easterbrook and Posner, from the Seventh Circuit, are credited with strongly influencing the evolution of securities class actions and class actions more generally. Sachs shows that Judges Easterbrook and Posner were able to do so through, between them, authoring the first 17 opinions on this topic in their circuit.[21]

A second rationale for attribution is that it discourages free riding associated with team production.[22] Sir Anthony Mason has suggested:

> The delivery of individual judgments does not prevent compliant judges from simply agreeing with the judgments of colleagues. Because the fact of mere agreement is thereby made public, it is possible that compliant judges would favour joint judgments which conceal any lack of contribution on their part.[23]

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19 Andrew Lo, 'A Judicial Whodunnit: Shedding Light on Unsigned Opinions', *Cognoscenti* (online), 30 July 2013 <http://cognoscenti.legacy.wbur.org/2013/07/30/unsigned-per-curiam-opinions-andrew-lo>.

20 Sir Douglas Menzies, 'The Right Honourable Sir Owen Dixon, OM, GCMG' (1973) 9 *Melbourne University Law Review* 1, 3.

21 Margaret V Sachs, 'Superstar Judges as Entrepreneurs: the Untold Story of Fraud-on-the-Market' (2015) 48 *University of California, Davis Law Review* 1207.

22 For discussion of joint judgments as teamwork see Andrew Lynch, 'Review Essay: Courts and Teamwork: What It Means for Judicial Diversity' (2015) 38 *University of New South Wales Law Journal* 1421. For the classic articulation of the difficulty of detecting shirking with team production see Armen A Alchian and Harold Demsetz, 'Production, Information Costs, and Economic Organization' (1972) 62 *American Economic Review* 777.

23 See Mason, 'Reflections on the High Court', above n 1, 110.

There are certainly instances of compliant judges throughout the history of the High Court. For example, Sir George Rich (1913–1950) and Sir Edward McTiernan (1930–1976), the two longest serving Justices of the High Court, frequently free rode on the work ethic and intellect of Sir Owen Dixon by joining judgments written by Dixon J or writing short concurring judgments.[24] Sir Robert Menzies writes of Rich J: 'truth requires me to say that he was inclined to be indolent. He certainly wrote a few individual judgments which were a joy to read; but on the whole he preferred to attach his name to a joint judgment, the labour of writing which he left to his judicial partner'.[25] In instances in which compliant judges join in the reasons prepared by others, attribution of authorship makes this transparent.[26]

To come back to Justice Kiefel's argument outlined at the beginning of this article, a third reason for authorship attribution is that 'some judges may feel a sense of loss'[27] in cases in which they do the bulk of the writing, but others join in. Some might argue that for a judge, contributing to the collective output of the Court is what matters and that personal recognition does not come into it. To put it differently, it has been said that judges have an 'institutional responsibility' with respect to judgment writing that outweighs self-expression.[28] To think that judges have higher standards of collective responsibility than the broader community, though, seems naïve. As Judge Richard Posner has articulated, there is no reason to think that the motivations of judges are any different than those of the rest of us.[29] The extent to which personal recognition for contributing to the development of the common law matters is likely to differ from judge to judge, just as the extent to which people place emphasis on personal recognition in academia and the broader community is heterogeneous. Some judges, though,

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24 In the Dixon Diaries, Dixon frequently refers to occasions in which McTiernan and Rich added their names to judgments he wrote – see Philip Ayres, 'Dixon Diaries' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 222. For empirical evidence of McTiernan and Rich JJ joining Dixon J during the period Sir John Latham was Chief Justice see Roger N Douglas, 'Judges and Policy on the Latham Court' (1969) 4 *Politics* 20; Russell Smyth, 'Judicial Interaction on the Latham Court: A Quantitative Study of Voting Patterns on the High Court 1935–1950' (2001) 47 *Australian Journal of Politics and History* 330, 338-340; Russell Smyth, 'Explaining Voting Patterns on the Latham High Court 1935–50' (2002) 26 *Melbourne University Law Review* 88, 100.

25 Sir Robert Gordon Menzies, *The Measure of the Years* (Cassell, 1970) 265.

26 This said, there are, of course, limitations when it comes to detecting shirking from just looking at the data and, in this respect, there is much value in consulting first-hand accounts of the Court's dynamic. For instance, Barton J's reputation for idleness in the early High Court (due to his propensity to frequently concur with Griffith CJ) is now generally considered as unearned. It is accepted that, based on information in his judge's notebook, Barton J would write his own judgment, but having heard, and agreed with, Griffith CJ's judgment would put it aside and state that he concurred: Geoffrey Bolton and John Williams, 'Barton, Edmund' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 53.

27 See Kiefel, above n 1, 557.

28 See Mason, 'Reflections on the High Court', above n 1, 110.

29 Richard A Posner, 'What do Judges and Justices Maximize? (The Same Thing Everybody Else Does)' (1993) 3 *Supreme Court Economic Review* 1; Richard A Posner, *How Judges Think* (Harvard University Press, 2010). For an extensive discussion of what motivates judges see Russell Smyth, 'Do Judges Behave as *Homo Economicus* and, If So, Can We Measure Their Performance? An Antipodean Perspective on a Tournament of Judges' (2005) 32 *Florida State University Law Review* 1299.

clearly do care about their judicial legacy, and correct attribution of authorship of joint judgments ensures that judges are given credit where it is due.[30]

Fourth, even if individual judges are not concerned with their legacies, it remains that observers of the Court continue to be. Claims are often made about who have been the 'great' Justices of the Court. For example, most regard Sir Owen Dixon as the greatest ever High Court judge.[31] The Hon Michael McHugh states: 'Sir Anthony [Mason] is regarded by many as one of the greatest judges that the Australian legal profession has produced, as important and as influential in the modern era as Sir Owen Dixon was in an earlier period'.[32] Such claims rest on the impact that individual judges have on the development of the law. This, in turn, depends on proper attribution of the authorship of leading joint judgments. There have been empirical studies that rank judges of the High Court according to reputation,[33] and examine factors that explain differences in reputation,[34] based on citations to judgments. These studies allocate equal credit to each of the authors of joint judgments. If it is possible to attribute authorship of joint judgments to a specific judge, or judges, the results from such studies will be more accurate. In the United States, Stephen Choi and Mitu Gulati have proposed the concept of a tournament of Court of Appeal judges in which the selection of judges to the United States Supreme Court is based on an empirical assessment of merit.[35] Such a concept has been debated in journal articles[36] and in the popular

30 See Fisk, above n 16.

31 For example, see Peter Heerey, '"A Towering Figure in the Law of this Country": Owen Dixon – Book Review' (2003) 77 *Australian Law Journal* 682, 682; S E K Hulme, 'Recollections Mainly to do with the Dixon Court' (2003) 77 *Australian Law Journal* 653, 654. In a recent speech, Justice Bell described Sir Owen Dixon as 'perhaps the greatest common lawyer of the last century': Virginia Bell, 'Equality, Proportionality and Dignity: The Guiding Principles for a Just Legal System' (Speech delivered at the Sir Ninian Stephen Lecture, University of Newcastle Conservatorium Concert Hall, Newcastle, 29 April 2016) 9 <http://www.hcourt.gov.au/assets/publications/speeches/current-justices/bellj/bellj29 apr2016.pdf>.

32 See McHugh, above n 12, 5.

33 Russell Smyth, 'Who Gets Cited? An Empirical Study of Judicial Prestige in the High Court' (2000) 21 *University of Queensland Law Journal* 7.

34 Mita Bhattacharya and Russell Smyth, 'The Determinants of Judicial Prestige and Influence: Some Empirical Evidence from the High Court of Australia' (2001) 30 *Journal of Legal Studies* 223.

35 Stephen Choi and Mitu Gulati, 'A Tournament of Judges?' (2004) 92 *California Law Review* 299.

36 Following the publication of Choi and Gulati, 'A Tournament of Judges?', above n 35, a special issue of the *Florida State Law Review* was allocated to discussing its merits. For an overview, see the introduction to the special issue: Stephen G Gey and Jim Rossi, 'Empirical Measures of Judicial Performance: An Introduction to the Symposium' (2005) 32 *Florida State University Law Review* 1001. For applications of the tournament of judges in the United States see Stephen J Choi and G Mitu Gulati, 'Choosing the Next Supreme Court Justice: An Empirical Ranking of Judge Performance' (2004) 78 *Southern California Law Review* 23; Stephen Choi and Mitu Gulati, 'Mr. Justice Posner? Unpacking the Statistics' (2005) 61 *New York University Annual Survey of American Law* 19; Stephen J Choi, Mitu Gulati and Eric A Posner, 'Judicial Evaluations and Information Forcing: Ranking State High Courts and their Judges' (2009) 58 *Duke Law Journal* 1313; Robert Anderson IV, 'Distinguishing Judges: An Empirical Ranking of Judicial Quality in the United States Court of Appeals' (2011) 76 *Missouri Law Review* 315. For a discussion of some of the difficulties associated with the application of a tournament of judges in an Australian context see Smyth, 'Do Judges Behave as *Homo Economicus*', above n 29.

media.[37] Correct attribution of the authorship of landmark decisions is relevant to such studies.

Finally, attributing authorship to joint judgments increases the information available to the 'consumers' of judgments,[38] such as other judges and the legal profession. Landes, Lessig and Solimine suggest that, through the quality of their judgments, judges develop brand name capital, which reduces search costs for consumers.[39] Relatedly, Choi and Gulati make the point that from a consumer perspective: 'If there are multiple [judgments] that relate to a particular issue and there is but a limited amount of time to allocate to the task of analysis, a choice has to be made about which of those [judgments] should receive more attention'.[40] In such a situation there are some judges that can be relied on for producing high quality judgments, and knowledge of the authorship of joint judgments provides a useful shortcut.[41]

Choi and Gulati mention two possible objections to this sort of research, which have been raised in relation to their own studies.[42] One is that judging involves the application of the law to the facts in a considered and impartial manner and, it is argued, that the issue of who wrote the judgment is of minimal value at best. What matters is the decision, not the reasons. We disagree with this view. As Oldfather, Bockhorst and Dimmer state:

> Even if one remains sceptical of the proposition that judicial opinions accurately report judicial reasoning, it seems unlikely to be the case that opinions tell us nothing useful. To be functional, a precedent-based system seemingly requires not only that written opinions exist, but that they be given authoritative weight.[43]

Robbins makes a similar point.[44] After noting that 'disclosure of a court's reasoning in published opinions is both how the judiciary asserts its authority and the means through which it is monitored …', he goes on to write:

> While legislation is the result of a prescribed process, when laws originate in the judiciary they have the potential to be more opaque because the process by which they are created is not directly accessible. The merit of the transparency of the procedure is just as vital as the integrity of the resulting law itself.[45]

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37 See, eg, New York Times, 'Assessing Sotomayor's Influence' *New York Times* (online), 28 May 2009 <http://www.nytimes.com/interactive/2009/05/28/us/politics/0529-judge-graphic.html> where the New York Times examined how Justice Sonia Sotomayor, then newly appointed to the United States Supreme Court, would perform in a tournament of judges.

38 Enid Campbell, 'Reasons for Judgment: Some Consumer Perspectives' (2003) 77 *Australian Law Journal* 62.

39 William M Landes, Lawrence Lessig and Michael E Solimine, 'Judicial Influence: A Citation Analysis of Federal Courts of Appeals Judges' (1998) 27 *Journal of Legal Studies* 271, 272.

40 Stephen J Choi and G Mitu Gulati, 'Which Judges Write their Own Opinions (And Should We Care)?' (2005) 32 *Florida State University Law Review* 1077, 1092.

41 Ibid.

42 Ibid 1094–6.

43 Chad M Oldfather, Joseph P Bockhorst and Brian P Dimmer, 'Triangulating Judicial Responsiveness: Automated Content Analysis, Judicial Opinions, and the Methodology of Legal Scholarship' (2012) 64 *Florida Law Review* 1189, 1206 n 70.

44 Ira P Robbins, 'Hiding Behind the Cloak of Invisibility: The Supreme Court and Per Curiam Opinions' (2012) 86 *Tulane Law Review* 1197, 1207–10.

45 Ibid 1207–8.

Knowledge of who wrote the judgment increases transparency of the procedure and can assist to better understand the policy preferences underlying the judgment. The reason is that individual judges have policy preferences and that these preferences will be reflected in the judgment.[46]

Another possible objection that Choi and Gulati mention is that using computational linguistics to attribute authorship is arguably an imperfect method, and that it would be more accurate to simply ask the judges who authored what. Jason Pierce was able to get 85 senior judges, including, at the time he did his research, 10 future, current and former High Court judges (including members of the Mason Court), to speak candidly with him about the Court.[47] If judges are willing to talk openly about other aspects of decision-making, perhaps they are also willing to disclose authorship. Hence, why not just ask the members of the Mason Court who wrote the joint judgments?[48] The answer is that such an approach would be unlikely to elicit the desired information. As Anne Twomey notes: 'Perhaps it was [Pierce's] status as an outsider that helped. It is extremely unlikely that these judges would have made the same comments to an Australian legal academic'.[49] Importantly, these judges were commenting on the Mason Court in general after being assured anonymity. This is very different to disclosing who wrote (parts of) specific joint judgments. And, even if the judges were willing to disclose such information, it is unlikely that they would remember who wrote the joint judgments in a large number of cases.[50] An advantage of our approach is that not only do we attribute authorship of a few key joint judgments from the Mason Court, but we discern authorship in a large number of joint judgments – 140 in total – in order to provide a more complete picture.

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46 See Choi and Gulati, 'Which Judges Write their Own Opinions (And Should We Care)?', above n 40, 1095.

47 See Pierce, above n 8, 293–6.

48 Section 129 of the *Evidence Act 1995* (Cth) has a privilege relating to reasons for a decision made by a judge, but this only applies in court proceedings and, on a stretch, would not apply to authorship – as opposed to reasons. Section 5.6.2 of the Australian Institute of Judicial Administration Incorporated, *Australian Guide to Judicial Conduct* (Australian Institute of Judicial Administration Incorporated, 2nd ed, 2007) 24 states that judges do not comment on their reasons in public after pronouncement. Again, it is unclear whether this extends to authorship of a joint judgment.

49 Anne Twomey, '*Inside the Mason Court Revolution: The High Court of Australia Transformed* by Jason L Pierce (Durham: Carolina Academic Press, 2006)' (2007) 31 *Melbourne University Law Review* 1174, 1175.

50 As an alternative to having to ask judges about who wrote what, one reader of an earlier version of this article suggested that if the identity of the author of a joint judgment is so important, in the future the Court should expressly state at the bottom of each judgment the name of the judge who wrote the judgment. This would remove the need for speculation regarding the 'real author'. We agree that this would represent a first best solution. It comes close to the Canadian approach where it seems that often the majority, or unanimous, decision is delivered pointedly by a particular judge – see, eg, *R v Villaroman* [2016] 1 SCR 1001. Also of note is the fairly recent tradition in the High Court when a new judge joins to have that judge deliver a decision where all the other judges agree in separate short reasons – see, eg, *Queensland Nickel Pty Ltd v Commonwealth of Australia* (2015) 255 CLR 252 for the instance in which Nettle J delivered the decision of the Court. However, this is a 'one off' for new judges and in the absence of such an initiative on a broader scale in Australia, if one is interested in the authorship of joint judgments, one needs other means, such as computational linguistics, to identify the author.

It is worth noting that Choi and Gulati were not analysing the authorship of joint judgments, which introduces further questions regarding shared authorship, and the difference between influence/reasoning and authorship. A further problem with attributing authorship of joint judgments is that more than one judge may have contributed to its content. Different parts of a judgment may be written by different judges or a given passage may have been written in different styles as part of a compromise on wording. This can make it difficult to attribute authorship with high probability in all cases.

Another objection to this sort of research is that the independence and integrity of the judiciary might be better served by allowing jointly authored decisions to stand as the will of the 'court' in order to perpetuate the ideal of a declaratory theory of law. An exercise in attribution of authorship, such as this, may risk exposing specific judges to criticism and political controversy. Consider the English Court of Appeal decision in *R v North and East Devon Health Authority; Ex parte Coughlan*,[51] where the joint judgment of the Court, constituted by Lord Woolf MR, Sedley and Mummary LJJ, began with the sentence: 'This is the judgment of the Court to which all members of the Court have contributed'. The decision enunciates a provocative, even radical, principle, and one wonders if the opening words of the judgment are designed by the Court to signal that they all took collective responsibility for the decision.

Does the perpetuation of the declaratory theory of law or the potential for political criticism targeted at an individual judge represent a valid argument against undertaking analysis to reveal the specific authorship of joint decisions? If, as the declaratory theory of law suggests, there is a body of rules always waiting to be declared and applied,[52] and it is simply the role of the judge to find the right rule and apply it in the circumstances, then authorship should not matter. However, the declaratory theory of the law has largely been rejected. Forty-five years ago, Lord Reid described it as a 'fairy tale'[53] and it was rejected by the House of Lords in *Kleinwort Benson Ltd v Lincoln City Council.*[54] Beginning with Windeyer J in *Skelton v Collins,*[55] many Australian judges have explicitly repudiated the declaratory theory of law.[56] Lord Bingham has written that appellate decisions invariably involve issues of policy and that policy choices become more important the higher the court.[57] If real policy choices have to be made, who is making those choices matters. Sir Anthony Mason has suggested that policy choices underpinning judicial decisions should be

51 [2001] QB 213, 222.
52 Sir Owen Dixon, 'Concerning Judicial Method' (1956) 29 *Australian Law Journal* 468, 469.
53 Lord Reid, 'The Judge as Law Maker' (1972) 12 *The Society of Public Teachers of Law* 22.
54 [1999] 2 AC 349.
55 (1966) 115 CLR 94, 134.
56 See, eg, Michael McHugh, 'The Law-Making Function of the Judicial Process – Part I' (1988) 62 *Australian Law Journal* 15, 16; Michael Kirby, *The Judges* (Australian Broadcasting Commission, 1983); Sir Anthony Mason, 'Legislative and Judicial Law-Making: Can We Locate an Identifiable Boundary?' (2003) 24 *Adelaide Law Review* 15, 18–21.
57 Lord Bingham of Cornhill, *The Business of Judging* (Oxford University Press, 2000) 28.

transparent.[58] Knowledge of who wrote a judgment contributes to making the policy preferences underpinning many appellate decisions more transparent.

Shielding individual judges from political criticism and ensuring the independence of the judiciary is a stronger argument for not attributing authorship in controversial cases. Decisions of the High Court have, from time to time, been subject to strong criticism from politicians and the media. Notable examples include *Mabo v Queensland [No 2]*,[59] *Dietrich v The Queen*[60] and *Wik Peoples v Queensland.*[61] Strong political criticism of individual judges does represent a danger to judicial independence.[62] The opposing point of view is the Jeffersonian argument, articulated at the beginning of this section, that attributing authorship of a judgment increases judicial accountability.[63] There are clearly trade-offs here between accountability and independence. As Markham puts it when writing about the United States Supreme Court: 'Having a Justice's name attached to an opinion brings a measure of accountability and control to an otherwise secretive institution, but this accountability carries with it a cost in the Court's ability to appear independent and above the political fray'.[64]

III EXISTING LITERATURE

Computational linguistics has long been used to authenticate the authorship of disputed documents. An important example of pioneering work in this area is the work of Mosteller and Wallace,[65] who attempted to determine the authorship of unsigned essays in the Federalist Papers. In addition, computational linguistics techniques have been used to examine the authenticity of the authorship of Shakespearean texts,[66] and to unmask Joe Klein as the anonymous author of *Primary Colors* – the novel inspired by Bill Clinton's first presidential campaign.[67]

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58 See Mason, 'Legislative and Judicial Law-Making', above n 56, 21.

59 (1992) 175 CLR 1.

60 (1992) 177 CLR 292.

61 (1996) 187 CLR 1.

62 See the discussion in Sir Anthony Mason, 'The Nature of the Judicial Process and Judicial Decision-Making' in Ruth Sheard (ed), *A Matter of Judgment: Judicial Decision-Making and Judgment Writing* (Judicial Commission of New South Wales, 2003) 1, 13–14.

63 See Robbins, above n 44, 1207–10.

64 James Markham, 'Note – Against Individually Signed Judicial Opinions' (2006) 56 *Duke Law Journal* 923, 926.

65 Frederick Mosteller and David L Wallace, 'Inference in an Authorship Problem: A Comparative Study of Discrimination Methods Applied to the Authorship of the Disputed *Federalist* Papers' (1963) 58 *Journal of the American Statistical Association* 275. Mosteller and Wallace concluded that James Madison, and not Alexander Hamilton, was the likely author.

66 See, eg, John Michell, *Who Wrote Shakespeare?* (Thames and Hudson, 1996) – using computational linguistics to examine arguments for and against different possible authors of Shakespearean texts; C B Williams, 'Mendenhall's Studies of Word-Length Distribution in the Works of Shakespeare and Bacon' (1975) 62 *Biometrika* 207 – using computational linguistics to examine whether Bacon or Marlowe wrote poems attributed to Shakespeare.

67 Don Foster, *Author Unknown: On the Trail of Anonymous* (Henry Holt, 2000). Foster compared the text of *Primary Colors* with Joe Klein's *Newsweek* columns and found similarities in terms of use of

Studies in authorship attribution vary in terms of their focus on different aspects of this task, viz texts of different lengths (ranging from tweets[68] to entire books[69]), different numbers of candidate authors (ranging from a handful[70] to thousands[71]), and different numbers of documents per author (ranging from one[72] to hundreds[73]). Koppel, Schler and Argamon,[74] and Statamatos,[75] offer survey articles detailing methods and features commonly used in authorship attribution. The most commonly employed method is Support Vector Machines ('SVMs'),[76] which is often used as a strong baseline with which to compare new methods in authorship attribution. Commonly used features for authorship attribution are: average sentence and word length;[77] presence or frequency of character n-grams,[78] word n-grams,[79] part-of-speech n-grams,[80] punctuation[81] and function

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particular adverbs and adjectives ending in the letter 'y', use of unusual adjectives, use of compound adjectives, high-frequency use of particular words, similar sentence structure and similarities in punctuation use.

68 Robert Layton, Paul Watters and Richard Dazeley, 'Authorship Attribution for Twitter in 140 Characters or Less' (Paper presented at the Second Cybercrime and Trustworthy Computing Workshop, IEEE Computer Society, 2010).

69 Shlomo Argamon and Shlomo Levitan, 'Measuring the Usefulness of Function Words for Authorship Attribution' (Paper presented at the Joint Annual Conference of the Association for Computers and the Humanities and the Association for Literary and Linguistic Computing, 2005).

70 Farkhund Iqbal et al, 'Mining Writeprints from Anonymous E-mails for Forensic Investigation' (2010) 7 *Digital Investigation* 56.

71 Moshe Koppel, Jonathan Schler and Shlomo Argamon, 'Authorship Attribution in the Wild' (2011) 45 *Language Resources and Evaluation* 83; see Layton, Watters and Dazeley, above n 68; Yanir Seroussi, Ingrid Zukerman and Fabian Bohnert, 'Authorship Attribution with Topic Models' (2014) 40 *Computational Linguistics* 269.

72 See Koppel, Schler and Argamon, 'Authorship Attribution in the Wild', above n 71.

73 Upendra Sapkota et al, 'Not All Character *N*-Grams Are Created Equal: A Study in Authorship Attribution' (Paper presented at *Human Language Technologies:* The 2015 Annual Conference of the North American Chapter of the Association for Computational Linguistics, Colorado, 31 May – 5 June 2015) 93 <http://www.aclweb.org/anthology/N15-1010.pdf>. See Layton, Watters and Dazeley, above n 68; Iqbal et al, above n 70; Seroussi, Zukerman and Bohnert, above n 71.

74 Moshe Koppel, Jonathan Schler and Shlomo Argamon, 'Computational Methods in Authorship Attribution' (2009) 60 *Journal of the American Society for Information Science and Technology* 9.

75 Efstathios Stamatatos, 'A Survey of Modern Authorship Attribution Methods' (2009) 60 *Journal of the American Society for Information Science and Technology* 538.

76 Ahmed Abbasi and Hsinchun Chen, 'Writeprints: A Stylometric Approach to Identity-level Identification and Similarity Detection in Cyberspace' (2008) 26 *ACM Transactions on Information Systems* Article No 7; Hoshiladevi Ramnial, Shireen Panchoo and Sameerchand Pudaruth, 'Authorship Attribution Using Stylometry and Machine Learning Techniques' in Stefano Berretti, Sabu M Thampi and Praveen Ranjan Srivastava (eds), *Advances in Intelligent Systems and Computing: Volume 384 – Intelligent Systems Technologies and Applications: Volume 1* (Springer, 2016) 113; Smita Nirkhi, R V Dharaskar and V M Thakare, 'Authorship Attribution of Online Messages using Stylometry: An Exploratory Study' (Paper presented at the International Conference on Advances in Engineering and Technology, Singapore, 29 – 30 March, 2014) 254. See Argamon and Levitan, above n 69; Sapkota et al, above n 73; Seroussi, Zukerman and Bohnert, above n 71.

77 See Iqbal et al, above n 70; Nirkhi, Dharaskar and Thakare, above n 76; Abbasi and Chen, above n 76.

78 See Li et al, above n 15; Layton, Watters and Dazeley, above n 68; Koppel, Schler and Argamon, 'Authorship Attribution in the Wild', above n 71; Sapkota et al, above n 73.

79 See Iqbal et al, above n 70; Abbasi and Chen, above n 76.

80 N-grams and parts-of-speech are defined in Part IV(B)(1). See Abbasi and Chen, above n 76.

81 See Ramnial, Panchoo and Pudaruth, above n 76.

words;[82] and vocabulary richness.[83] Statamatos and others[84] describe two novel tasks related to authorship attribution: author clustering (establishing authorship links in single-authored documents) and author diarisation (segmenting multi-authored documents into authorial components). The latter is particularly relevant to teasing out the individual contributions of judges in joint judgments, such as those discussed in this article.

The level of performance considered adequate for an authorship-attribution system depends on these factors, as well as on the task at hand. The larger the dataset used for training (and the more representative it is of the test set), and the lower the number of authors, the higher the expected level of performance. For instance, Seroussi, Zukerman and Bohnert obtained 94 per cent accuracy for a dataset comprising 1342 judgments by three judges in the Dixon Court, and 44 per cent accuracy for a dataset of 271 625 film reviews written by 22 116 authors.[85] Clearly, the required accuracy increases as the implications of a task become more far reaching, eg, the accuracy of an authorship attribution system must be extremely high when it is used to make life-changing determinations.

In the judicial realm, computational linguistics has been employed in a wide range of criminal investigations,[86] including high-profile murder investigations in the United States, such as the Jon-Benet Ramsey murder investigation and the Unabomber prosecution.[87] Another legal application is its use to verify confessions in criminal trials.[88] Recently, several studies have used computational linguistics to examine authorship of judicial opinions in the United States. One set of such studies has examined whether judges or their clerks wrote specific judicial opinions.[89] Another strand of this literature has used computational linguistics to attribute authorship to unsigned opinions in the Roberts Supreme Court.[90] In related research, Carlson, Livermore and Rockmore use computational

82 See Argamon and Levitan, above n 69; Iqbal et al, above n 70; Nirkhi, Dharaskar and Thakare, above n 76; Ramnial, Panchoo and Pudaruth, above n 76; Seroussi, Zukerman and Bohnert, above n 71.

83 See Abbasi and Chen, above n 76; Iqbal et al, above n 70; Nirkhi, Dharaskar and Thakare, above n 76.

84 Efstathios Stamatatos et al, 'Clustering by Authorship Within and Across Documents' (2016) 1609 *CEUR Workshop Proceedings* 691.

85 See Seroussi, Zukerman and Bohnert, above n 71, 289, 296, 300.

86 Lawrence M Solan and Peter M Tiersma, *Speaking of Crime: The Language of Criminal Justice* (University of Chicago Press, 2005) 149–78.

87 See Foster, above n 67. In the Unabomber trial, Foster and others compared the known writings of Theodore J Kaczynski with the known writings of the Unabomber and found similarities in terms of sentence structure, spelling of particular words and use of grammar/punctuation. In the Jon-Benet Ramsey murder investigation Foster used word frequency to attempt to identify the murderer.

88 Bryan Niblett and Jillian Boreham, 'Cluster Analysis in Court' (1976) 17 *Jurimetrics Journal* 32.

89 Kelly Bodwin, Jeffrey S Rosenthal and Albert H Yoon, 'A Statistical Approach to Judicial Authorship: A Case Study of Judge Easterbrook' (2013) 37(2) *Advances and Applications in Statistics* 123; Choi and Gulati, 'Which Judges Write their Opinions (And Should We Care?)', above n 40; Jeffrey S Rosenthal and Albert H Yoon, 'Judicial Ghostwriting: Authorship on the Supreme Court' (2011) 96 *Cornell Law Review* 1307; Jeffrey S Rosenthal and Albert H Yoon, 'Detecting Multiple Authorship of United States Supreme Court Legal Decisions Using Function Words' (2011) 5 *Annals of Applied Statistics* 283; Paul J Wahlbeck, James F Spriggs II and Lee Sigelman, 'Ghostwriters on the Court? A Stylistic Analysis of US Supreme Court Opinion Drafts' (2002) 30 *American Politics Research* 166.

90 See Li et al, above n 15.

linguistics to analyse changes in judicial writing style over the entire history of the United States Supreme Court.[91]

The only study that uses computational linguistic methods for the attribution of authorship of judgments in Australia is that conducted by Seroussi, Smyth and Zukerman, who examine the extent to which Dixon J ghosted for McTiernan and Rich JJ.[92] It is well known from the Dixon Diaries that Dixon J ghost wrote judgments for Rich J and, to a lesser extent, McTiernan J.[93] The study by Seroussi, Smyth and Zukerman attributed, perhaps somewhat provocatively, 18 per cent of Rich J's judgments and four per cent of McTiernan J's judgments to Dixon J for the periods Dixon J was on the High Court with each of these judges.[94] There are, however, no studies that examine the authorship of joint judgments on the High Court, which is the objective of the current study.

IV APPROACH

A Data

We examine authorship in 140 joint judgments of the Mason Court where all (or almost all) judges hearing the case signed their name in decisions of three, five and seven judge panels.[95] In addition to these judgments, to learn the writing style of each of the eight judges who served on the Mason Court, we employed a dataset comprising 100 single-authored judgments attributed to each judge (800 single-authored judgments in total).[96] All judgments in this dataset were retrieved from the Australasian Legal Information Institute ('AustLII') database.[97] This repository was used because computational linguistic methods, such as that employed in this study, require text files.

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91 Keith Carlson, Michael A Livermore and David Rockmore, 'A Quantitative Analysis of Writing Style on the U.S. Supreme Court' (2016) 93 *Washington University Law Review* 1461.

92 Yanir Seroussi, Russell Smyth and Ingrid Zukerman, 'Ghosts from the High Court's Past: Evidence from Computational Linguistics for Dixon Ghosting for McTiernan and Rich' (2011) 34 *University of New South Wales Law Journal* 984. Seroussi, Zukerman and Bohnert, above n 71 use the same dataset, along with other datasets, in a different paper that examines the accuracy of various methods.

93 See Philip Ayres, *Owen Dixon* (Miegunyah Press, 2003) 68, 73, 93–4, 320 n 53.

94 Seroussi, Smyth and Zukerman, above n 92, 986.

95 In saying 'almost all' in some cases in our sample with five and seven judge panels, the joint judgment was delivered by four or six judges respectively with a separate concurring (or dissenting) opinion. As our focus is on unanimous (or near unanimous) judgments of the Court, we do not consider cases with several joint and single judgments. This means we do not consider authorship of judgments in some of the important cases decided by the Mason Court, such as *Mabo v Queensland [No 2]* (1992) 175 CLR 1, where there were five separate judgments, of which two were joint.

96 Although the actual authorship of these judgments cannot be known with certainty, the single-author judgments of each judge are sufficiently stylistically similar to each other, so that even if another person (eg, an associate) assisted, it is reasonable to believe that the majority of each judgment was written by its putative author.

97 Australasian Legal Information Institute, *Databases: High Court of Australia* <http://www.austlii.edu.au/au/cases/cth/HCA/>.

B Method

We employ a classifier to determine the authorship of each multi-authored judgment. In general, classification methods categorise data into target classes on the basis of insights obtained from samples with known classes. In our case, the data to be classified are joint judgments, and the authorship of each judgment is attributed by the classifier to a particular judge on the basis of insights obtained from single-authored judgments with known authors. The classifier is trained to learn important characteristics of the writing style of each judge from features extracted from the 100 judgments with known authorship. The usefulness of the classifier in general, and of these features in particular, is determined by first testing the classifier's performance on a subset of judgments with known single authors that was not used for training. If this test proves successful, the classifier is employed to determine the authorship of judgments with unknown authorship.

The main classifier we employ to learn important characteristics of the writing style of each judge is SVMs.[98] SVMs are discriminative classifiers that endeavour to find a *linear separating hyperplane* between data points belonging to two distinct classes, such that the distance from this hyperplane to its nearest data point is maximal. This hyperplane must be linear in some dimension, which may be higher than the original dimension of the data (eg, some non-linear boundaries in two-dimensional space can be mapped into linear boundaries in three-dimensional space). SVMs were selected for this study because (a) they achieve near state-of-the-art performance for the authorship attribution task (as mentioned above, they are often used as a strong baseline), and (b) they are readily available.[99]

1 Obtaining Features from Texts

To classify a text, ie, to determine its author in our case, we must extract from the text features that shed light on this question. We experimented with the following basic features, which are commonly used for authorship attribution:[100] token n-grams, part-of-speech n-grams and combinations thereof. A token is a word or punctuation mark in a text; a part-of-speech represents the syntactic category of a token, eg, noun, verb or adjective; and an n-gram is a generic designation for a group of tokens or parts-of-speech, also denoted as unigram, bigram, trigram, etc for n = one, two, three, etc respectively. In other words, a token or part-of-speech unigram is the actual token or part-of-speech respectively, a bigram is a pair of tokens or parts-of-speech, a trigram is a triple, and so on. A part-of-speech n-gram differs from a token n-gram in that it

98 See generally, Vladimir N Vapnik, *Statistical Learning Theory* (Wiley-Interscience, 1998), chs 9–13.

99 See Koppel, Schler and Argamon, 'Computational Methods in Authorship Attribution', above n 74; Seroussi, Smyth and Zukerman, above n 92, 996; Patrick Juola, 'Authorship Attribution' (2006) 1 *Foundations and Trends in Information Retrieval* 233. The Disjoint Author-Document Topic ('DADT') approach (see Seroussi, Zukerman and Bohnert, above n 71) slightly outperforms SVMs. However, we decided to employ SVMs because of their wider accessibility, and hence the ease of experiment replication.

100 See Koppel, Schler and Argamon, 'Computational Methods in Authorship Attribution', above n 74, 11–12.

abstracts from particular word choices, reflecting an author's preference for how to structure a sentence. We experimented with n-grams of different sizes, where n ranged from one to five (the same n was used for tokens and for parts-of-speech).

To illustrate these concepts, consider the following phrase from one of Mason's judgments: 'Although I accept the authority of earlier decisions'.[101] Table 1 shows each token n-gram (n = one, two, three) in the sentence with its corresponding part-of-speech n-gram.[102]

Table 1: Tokens and part-of-speech tags in a sentence from Mason's judgments

Unigrams	Token	*Although*	*I*	*Accept*	*The*	*authority*	*of*	*earlier*	*decisions*
	Part of speech	IN	PRP	VBP	DT	NN	IN	JJR	NNS
Bigrams	Token	*Although I*	*I accept*	*accept the*	*the authority*	*authority of*	*of earlier*	*earlier decisions*	
	Part of speech	IN PRP	PRP VBP	VBP DT	DT NN	NN IN	IN JJR	JJR NNS	
Trigrams	Token	*Although I accept*	*I accept the*	*accept the authority*	*the authority of*	*authority of earlier*	*of earlier decisions*		
	Part of speech	IN PRP VBP	PRP VBP DT	VBP DT NN	DT NN IN	NN IN JJR	IN JJR NNS		

The process of extracting basic features is repeated for all the sentences in each judgment. Prior to extracting these features, we removed from the judgments quotations from other sources, including extracts from legislation, as they reflect the style of other authors, rather than the style of the author of the judgment being examined. However, we retained the quotation marks, as they indicate an author's tendency to use quotations in their prose. In addition, numbers and dates in the judgments were omitted from the token n-grams in order to avoid the inclusion of spurious information. We did, nonetheless, retain their part-of-speech tags in order to reflect an author's tendency to use numbers.

After extracting the basic features of each judgment, we computed two types of derived features from the basic features: presence and frequency. Presence indicates whether a token or part-of-speech n-gram was used at least once in a judgment, while frequency indicates how often a token or part-of-speech n-gram was used. For example, the total number of token unigrams in one of Mason CJ's judgments is 1584, and the unigram 'I' appears nine times. Thus, 'I' is present in

101 *Forster v Jodex Australia Pty Ltd* (1972) 127 CLR 421, 453. As explained below, our approach relies on having a set of 100 single authored judgments for each judge. This case was one of the single authored judgments by Mason J which we used.

102 The part-of-speech tags are specified in the *Penn Treebank Tag Set*, The Penn Treebank Project <https://www.ling.upenn.edu/courses/Fall_2003/ling001/penn_treebank_pos.html>, and are replicated in Table A1 in Appendix I. In our example, 'IN' stands for preposition or subordinating conjunction; 'PRP' for personal pronoun; 'VBP' for verb, singular present, non 3rd person; 'DT' stands for determiner; 'NN' for singular noun; 'JJR' for adjective, comparative; and 'NNS' for noun, plural.

the judgment, and its frequency is 9/1584 = 0.0057. This calculation is repeated for all the basic features in each judgment, yielding a feature vector that contains the presence and frequency of each token n-gram and each part-of-speech n-gram in each judgment (n = one, …, five) – one vector per judgment.

A feature vector typically contains thousands of numbers, many of which are not helpful for the classification task (in fact, the proliferation of features hinders this task).[103] This problem is usually addressed by identifying and retaining the most useful features.[104] To perform this task, we used an iterative feature-selection process that combines SVMs with a technique called recursive feature elimination:[105] in each iteration, features that have the lowest discriminative power are removed, and the SVM classifier is trained using the remaining features. This process continues until a desired number of features remain in the data set, while performance improves or remains stable. We experimented with up to 30 000 derived features in total, obtaining the best performance with 5000 features; the classifier's performance did not change when more features were retained. It is worth noting that n-grams with more than three tokens or parts-of-speech were removed during this process.

Table 2 displays the most informative token and part-of-speech n-grams of Mason CJ according to their presence and frequency in his judgments. Specifically, the table shows 15 token n-grams and 15 part-of-speech n-grams whose presence was indicative of Mason CJ's style, and 15 token n-grams and 15 part-of-speech n-grams whose frequency was indicative of Mason CJ's style (note that we did not find token trigrams whose frequency was deemed useful for the identification Mason CJ's prose). These features stipulate that, for example, the presence (or absence) of 'to show that' and a particular frequency of usage of 'to that' help distinguish between Mason CJ and other judges. The list of the most informative token n-grams according to presence and frequency (top 15 for each) for the seven other judges in the Mason Court appears in Table A2 in Appendix II, and the list of the most informative part-of-speech n-grams appears in Table A3 in Appendix III.

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103 Daphne Koller and Mehran Sahami, 'Toward Optimal Feature Selection' (Paper presented at the 13th International Conference on Machine Learning, Bari, Italy, July 1996) 284 <http://ai.stanford.edu/users/koller/Papers/Koller+Sahami:ICML96.pdf>.

104 For a survey of feature selection methods see George Forman, 'An Extensive Empirical Study for Feature Selection Metrics for Text Classification' (2003) 3 *Journal of Machine Learning Research* 1289.

105 Isabelle Guyon et al, 'Gene Selection for Cancer Classification using Support Vector Machines' (2002) 46 *Machine Learning* 389.

Table 2: List of the most discriminative features for Mason

Token n-gram presence			Token n-gram frequency		
Unigram	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
respective, at, though, show, stated, who	the respective, that view, to consider, show that, to show, stated by, is not, of that	to show that	at, to, had, subject, industry, view, what, might, and, able, taxation	and the, to that, to be, might be	
Part of speech n-gram presence			**Part of speech n-gram frequency**		
Unigram	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
LS	LS DT, NN LS, LS IN, CD PRP, CD CD	LS DT NN, DT NN CD, CD DT JJ, NN LS DT, DT NN LS, DT VBG IN, NN CD DT, PRP NN NN, CD CD DT	WP, LS, CD	JJ TO, NNP VBD, TO VB, NN LRB, VBN RB, VBN VBN, CD DT, LRB IN, LS DT	JJ TO VB, VBN IN DT, DT NNP IN

2 Building an SVM Classifier

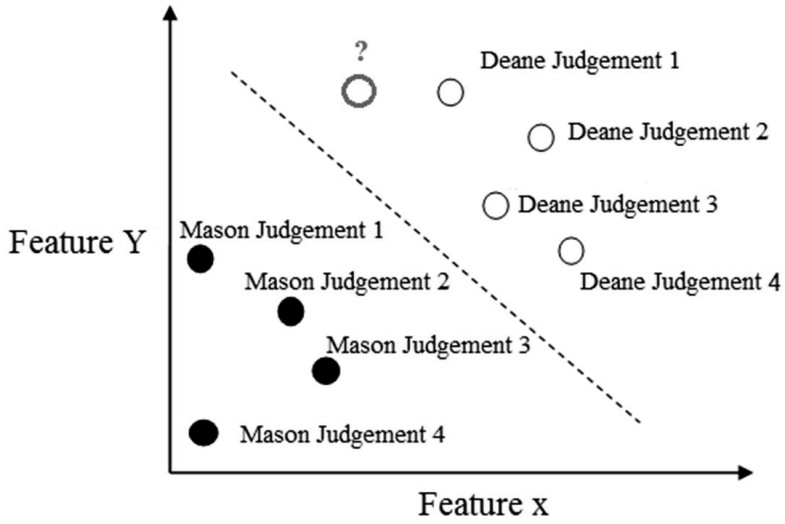
As mentioned above, we employ SVMs to identify the main author of a judgment. SVMs view each judgment as a point in space that is represented by a vector of features. Given two sets of judgments with known authorship, the SVM algorithm finds the best separation of these judgments into two areas in space based on their feature values, where each area corresponds to a different judge.[106] Then, given a judgment that may have been written by one of several possible authors, its features are used to determine the area where it falls, ie, the judge who wrote it. The results reported in this article were obtained with an SVM whose separator is linear in the original feature space.

Figure 1 illustrates a simplified version of the operation of the SVM algorithm for a hypothetical Mason CJ/Deane J case, where, for illustrative purposes, we assume that there are only two features (as seen above, the typical number of features is much larger): each judgment with known authorship is represented as a point in the plane, and the dashed line is generated by the SVM as a separator between the judgments written by the two judges. Given a judgment with disputed authorship, its features are extracted in order to convert it to a point in space. If this point falls above the dashed line, the judgment is deemed to be written by Deane J; otherwise, it is attributed to Mason CJ. The

106 As mentioned above, SVMs find the hyperplane that best separates the samples from the two classes.

larger the distance between the judgment and the line, the more certain the classifier is about its prediction.

Figure 1: A simple hypothetical SVM for the Mason CJ/Deane J classification problem



As seen in Figure 1, SVMs are binary classifiers, ie, they discriminate between two possible labels of a datum. However, recall that we have eight judges in the Mason Court (with McHugh J replacing Wilson J), which demands the application of a *multi-class SVM* to identify one judge as the author of a judgment. We use the one-versus-all variant of multi-class SVMs,[107] whereby one binary classifier is built to discriminate between one judge and all the others (yielding eight binary classifiers in total). In order to determine who authored a disputed judgment, the judgment is given as input to each classifier. The classifier then selects either its judge or the other judges, and outputs the distance between this judgment and the separating hyperplane. The judge corresponding to the classifier that returns the largest distance is then selected.

3 Evaluating a Classifier's Performance

Before applying our SVM classifier to analyse the jointly authored judgments of the Mason Court, we established the classifier's credibility. To do so, we evaluated the classifier on a set of 800 single-authored judgments with known authors – 100 judgments per judge – where each judgment is represented by a feature vector. The evaluation is performed by applying a method known as ten-fold cross-validation, whereby the data are partitioned into 10 distinct subsets called folds, such that nine folds are used for training the classifier, and one fold is used for testing it. Each training fold contains 90 judgments written by each judge, and each test fold contains 10 judgments written by each judge. During the

107 Christopher M Bishop, *Pattern Recognition and Machine Learning* (Springer, 2006) 338.

training phase, the classifier identifies the features that are potentially useful for discriminating between the authors of the judgments in each of the nine training folds.[108] During the testing phase, the usefulness of these features is ascertained with respect to the judgments in the test fold. That is, the classifier attributes each judgment in the test fold to a particular judge, and the correctness of these attributions is determined by comparing them to the known authors of these judgments.

This evaluation is repeated 10 times, each time with a different testing fold (with the remaining nine folds used to train the classifier) in order to ensure that the classifier did not get lucky or unlucky with particular combinations of training and testing folds. Upon completion of the cross-validation process, each judgment has been considered once in the testing phase. The metrics that evaluate the classifier's performance on each judgment are then averaged to obtain a measure of the overall performance of the classifier. This measure represents our confidence in the predictions made by the classifier.

There are many metrics that evaluate a classifier's performance,[109] of which we have chosen Precision, Recall and F-score, described below.[110] Precision and recall represent complementary aspects of a classifier's performance, and F-score combines these metrics.

- Precision is the ratio of the correct predictions of a class to the total number of predictions of that class. It represents the probability that the classifier predicts the class label of a datum correctly. For instance, if a classifier predicts that 100 judgments were authored by Mason CJ, and this is true for 95 of these judgments, then the precision of this classifier with respect to Mason CJ's judgments is 95/100 = 0.95.
- Recall is the ratio of the correct predictions of a class to the total number of data points with that class label. It represents the probability that the classifier will find the data points belonging to a specific class. For example, if Mason CJ authored 100 judgments, and the classifier correctly identifies 90 of these judgments (and misses 10), then the recall of this classifier with respect to Mason CJ's judgments is 90/100 = 0.9.
- F-score combines precision and recall by computing their harmonic mean.[111]

A final consideration of our evaluation pertains to the manner in which SVMs are used. SVMs are categorical classifiers, in the sense that they do not

108 As mentioned above, we employ recursive feature elimination to remove features with low discriminating power. This is done by averaging the weight of each feature over the models obtained from all the training sets, removing the features with low weights, and retraining the SVM without these features. This process is repeated until no more features can be removed.

109 Ian H Witten, Eibe Frank and Mark A Hall, *Data Mining: Practical Machine Learning Tools and Techniques* (Morgan Kaufmann, 3rd ed, 2011) ch 5.

110 See generally, Gerald Salton and Michael J McGill, *Introduction to Modern Information Retrieval* (McGraw-Hill, 1983) ch 4.

111 The harmonic mean of precision (P) and recall (R) is $2/(\frac{1}{P}+\frac{1}{R})$.

provide confidence scores for their decisions. However, Platt[112] proposed a method to derive probabilities from the distances between data points and the separating hyperplane; these probabilities are reported with our results in Part V.

Table 3 shows the results of our evaluation for the eight judges who formed part of the Mason Court. As seen in the table, 99 per cent of the judgments attributed to Mason CJ were indeed authored by him (precision = 0.99), and 96 per cent of the judgments written by Mason CJ were identified as such (recall = 0.96). The worst performance, which still has an F-score greater than 0.9, was obtained for Dawson and McHugh JJ (precision of 0.93 and 0.92 respectively, and recall of 0.93). In contrast, all of Deane J's judgments were correctly identified (recall = 1), but two judgments by other judges were incorrectly identified as Deane J's (precision = 0.98). Overall, on average, our classifier's precision and recall was 0.95 – a level of performance that matches the state-of-the-art.

Table 3: Precision, recall and F-score measures for each judge

Class Label	Average Precision	Average Recall	Average F-score
Brennan J	0.95	0.95	0.95
Dawson J	0.93	0.93	0.93
Deane J	0.98	1.00	0.99
Gaudron J	0.96	0.94	0.95
Mason CJ	0.99	0.96	0.97
McHugh J	0.92	0.93	0.93
Toohey J	0.96	0.95	0.95
Wilson J	0.94	0.97	0.96
Average	0.95	0.95	0.95

To further examine the accuracy of our approach, we built a confusion matrix, shown in Table 4, where the rows represent the true judgments of a judge, the columns represent the predicted judgments, and the diagonals contain the recall for a judge. For instance, the classifier attributed 96 of Mason CJ's judgments to himself, two to Toohey J, and one to each Dawson and Wilson JJ. The pairs of judges who were confused most often for each other are Gaudron and McHugh JJ (four of Gaudron J's judgments were attributed to McHugh J, and three of McHugh J's judgments to Gaudron J), and Dawson and Brennan JJ (three mis-attributions each). Looking at the columns of Table 4, Mason and Deane JJ were seldom attributed the judgments of others, while this happened

112 John C Platt, 'Probabilities for S V Machines' in Alexander J Smola et al (eds), *Advanced in Large Margin Classifiers* (MIT Press, 2000) 61.

most often to McHugh J (eight judgments), Dawson J (seven judgments) and Wilson J (six judgments).

Table 4: Confusion matrix for the judges on the Mason Court

Predicted / True	Brennan J	Dawson J	Deane J	Gaudron J	Mason J	McHugh J	Toohey J	Wilson J
Brennan J	95	3	2	0	0	0	0	0
Dawson J	3	93	0	0	0	2	1	1
Deane J	0	0	100	0	0	0	0	0
Gaudron J	1	1	0	94	0	4	0	0
Mason J	0	1	0	0	96	0	2	1
McHugh J	0	1	0	3	0	93	1	2
Toohey J	0	1	0	1	0	1	95	2
Wilson J	1	0	0	0	1	1	0	97

V RESULTS

A *Cole v Whitfield*

The unanimous judgment in *Cole v Whitfield*[113] stands out as one of the most significant judgments of the Mason Court. In *Cole v Whitfield* the Court overruled earlier principles in favour of treating section 92 of the Constitution as a prohibition of discrimination against interstate trade with protectionist effect.[114] Leslie Zines has described *Cole v Whitfield* as the most important case decided by the Mason Court.[115] Sir Anthony Mason has described *Cole v Whitfield* as his Court's greatest achievement.[116] Pierce, Weiden and Wood describe *Cole v Whitfield* as 'one of the most important cases in the Court's history'.[117] It amounted to what Landes, Lessig and Solimine have coined a 'super precedent – a precedent that is so effective in clearing up an unsettled area of law that future disputes settle rather than go to trial'.[118] *Cole v Whitfield* clarified the law (as well

113 (1988) 165 CLR 360.

114 For comment on the case see Gonzalo Villalta Puig, *The High Court of Australia and Section 92 of the Constitution: A Critique of the Cole v Whitfield Test* (Lawbook, 2008); Michael Coper, '*Cole v Whitfield*' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 108.

115 Leslie Zines, 'Most Significant Case of the Mason Court' [1995] (June) *Australian Lawyer* 18, 18.

116 Interview, 'In Conversation: An Interview with Sir Anthony Mason' (1996) 17 *Singapore Law Review* 3, 6. See also Barnett, above n 14, where Mason states that 'the two outstanding judgments in terms of significance' while he was Chief Justice were *Mabo v Queensland [No 2]* (1992) 175 CLR 1 and *Cole v Whitfield* (1988) 165 CLR 360.

117 Jason L Pierce, David L Weiden and Rebecca D Wood, 'The Changing Role of the High Court of Australia' [2011] *SSRN Electronic Journal* 1, 9 <http://ssrn.com/abstract=1742024>.

118 Landes, Lessig and Solimine, above n 39, 274.

as narrowing the provision of section 92), such that there was very little litigation on that section for two decades.[119]

The SVM classifier chose Mason CJ as the main author of this judgment (with probability 0.82).[120] Sir Anthony Mason has suggested that: '*Cole v Whitfield* on s 92 was the result of an intensive collective effort by the Court to produce a unanimous judgment. But that effort was expensive in terms of time and effort. It was not an effort that could readily be repeated.'[121] Our results indicate that it is likely that even if the judgment was written as the result of a conference between all the judges, the ultimate person tasked with writing the judgment was the Chief Justice, which appears to accord with his role as leading the effort in writing the judgment communally. This finding is consistent with the tenor of existing speculation that the Chief Justice wrote the judgment, or substantial parts thereof, in *Cole v Whitfield*.[122]

B *Newspaper Rule* And *Spycatcher* Judgments

The Mason Court also delivered other unanimous judgments, which went on to reshape various aspects of Australian law, such as the *Newspaper Rule Case*,[123] which changed defamation law in Australia.[124] Another notable joint judgment was the majority judgment in the *Spycatcher Case*,[125] which concerned the publication of a book by a former officer of the British Security Service, and involved litigation in Australia, New Zealand and the United Kingdom.[126] In a comment contemporary with the case, J G Starke stated: 'The decision [in the *Spycatcher Case*] will long rank as one of the most important ever given by the High Court'.[127] We took these judgments as being two specific samples of notable joint judgments delivered by the Mason Court. According to the SVM

119 Michael Coper, '*Betfair Pty Ltd v Western Australia* and the New Jurisprudence of Section 92' (ANU College of Law Research Paper No 13–17, Australian National University, September 2013) 6.

120 To further validate our SVM classifier, we trained and tested an additional classifier, which was based on multinomial logistic regression (see Bishop, above n 107, 209) – another technique that has exhibited state-of-the-art performance in authorship attribution. See David Madigan et al, 'Bayesian Multinomial Logistic Regression for Authorship Identification' (2005) 803 *AIP Conference Proceedings* (2005) 509; Tieyun Qian et al, 'Tri-Training for Authorship Attribution with Limited Training Data' in *Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics* (Association for Computational Linguistics, 2014) 345. This classifier, which yielded a recall score of 0.95 and precision of 0.96 on the initial corpus, agreed with our SVM classifier in all cases, and the probabilities returned by these classifiers had a Pearson correlation coefficient of 0.89.

121 Sir Anthony Mason, 'The High Court of Australia – Reflection on Judges and Judgments' (2013) 16 *Southern Cross University Law Review* 3, 9.

122 See references cited at above n 14.

123 *John Fairfax & Sons Ltd v Cojuangco* (1988) 165 CLR 346 ('*Newspaper Rule Case*'). The unanimous decision of the Court consisted of a joint judgment of Mason CJ, Wilson, Deane, Toohey and Gaudron JJ.

124 See Sally Walker, 'Compelling Journalists to Identify Their Sources: The "Newspaper Rule" and "Necessity"' (1991) 14 *University of New South Wales Law Journal* 302.

125 *A-G (UK) v Heinemann Publishers Australia Pty Ltd* (1988) 165 CLR 30 ('*Spycatcher Case*').

126 See Matthew Howard, 'Spycatcher Down Under: *Attorney-General for the United Kingdom v Heinemann Publishers Australia*' (1989) 19 *University of Western Australia Law Review* 158; James Michael, 'Notes of Cases: Spycatcher's End?' (1989) 52 *Modern Law Review* 389.

127 J G Starke, 'Current Topics: High Court's Decision in the "Spycatcher" Case' (1988) 62 *Australian Law Journal* 579, 579.

classifier, the main author of the judgment in the *Newspaper Case* and the judgment in the *Spycatcher Case* was Mason (with probability 0.89 and 0.88 respectively).

These findings point to Mason CJ's intellectual leadership in the Mason Court. An empirical study of voting patterns on the Mason Court shows that the Chief Justice formed part of the successful majority more than any other justice, and he was joined more often by other justices than any other member of the Court.[128] Several commentators have referred to the intellectual leadership of the Mason Court provided by the Chief Justice.[129] Also of note is the authorship pattern of Brennan J, who chose to write his own judgment in the *Spycatcher Case*, separate from the rest of the Court's joint judgment. Justice Brennan frequently did this, in fact, choosing to author his own judgment in spite of the rest of the court signing on to a single judgment.[130]

C Unanimous Judgments in Constitutional Cases

We next examine the authorship of 18 unanimous judgments in constitutional cases. Each of these cases involved a unanimous joint judgment of a Full Court consisting of five or seven Justices.

Table 5 displays these judgments, and the judge to which they were attributed by our classifier, together with the probability of this attribution. In 10 of the 18 cases, the probability associated with the top-ranked judge is greater than or equal to 0.6. In these cases, we have attributed the main authorship of a judgment to that judge. In the remaining eight cases, the probability of the top-ranked judge is below 0.6, with other judges being assigned non-negligible probabilities. In such cases, there are sufficient stylistic markers to support the cautious inference that more than one judge contributed to a judgment. These cases are highlighted in grey in Table 5 with the judges listed in descending order of probability.

Of the 10 cases for which the probability associated with the top-ranked judge is greater than or equal to 0.6, our SVM classifier attributes authorship of four of the judgments to Mason CJ, three to Deane J, two to Wilson J and one to Gaudron J. Along with Mason CJ, commentators have proffered that Sir William Deane was an intellectual leader of the Mason Court.[131] Pierce notes that much of the transformation that occurred on the Mason Court was led by Mason CJ and

128 Russell Smyth, '"Some are More Equal than Others" – An Empirical Investigation into the Voting Behaviour of the Mason Court' (1999) 6 *Canberra Law Review* 193, 207.

129 See Kirby, 'AF Mason: From *Trigwell* to *Teoh*', above n 7; Saunders, above n 7; Pierce, above n 8; McHugh, above n 12.

130 This occurs on 19 separate occasions during Mason CJ's leadership of the court.

131 For example, according to his biographer, former Prime Minister, Paul Keating, regarded Sir William Deane as the 'intellectual leader' of the Mason Court and this was a primary reason for appointing him Governor General – see Don Watson, *Anniversary Edition: Recollections of a Bleeding Heart: A Portrait of Paul Keating PM* (Vintage Books, 2001) 596–8. See also Brian Carroll, *Australia's Governor General: From Hopetoun to Jeffery* (Rosenberg, 2004) 187. For evidence of the breadth of Deane J's intellectual leadership on the Mason Court in equity, human rights and tort law see Rosalind Atherton et al, 'Deane, William Patrick' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 195.

Deane J.[132] Deane J was well known for his constitutional scholarship,[133] and Gaudron J has been bracketed with Mason CJ and Deane J as a leader of the Mason Court.[134] Hence, the findings regarding these three judges are to be expected. Wilson J is perhaps less well remembered as a constitutional scholar, and does not feature close to the top in terms of rankings of High Court judges based on reputation.[135] He was also on the Mason Court only for a relatively short period, and is not referred to as a leader of the Court in the way, for instance, Mason CJ, Deane, Gaudron or even Toohey JJ have been regarded.[136] This said, as Durack notes, Wilson J participated in a number of important cases on the Mason Court, including constitutional cases.[137]

Table 5: Unanimous judgments in constitutional cases: cases with low-probability predictions are indicated in grey

Case Name	Prediction	Probability
Air Caledonie International v Commonwealth [1988] HCA 61; (1988) 165 CLR 462 (24 November 1988)	Deane J	0.80
Alexandra Private Geriatric Hospital Pty Ltd v Commonwealth [1987] HCA 6; (1987) 162 CLR 271 (10 March 1987)	Wilson J	0.60
Barley Marketing Board (NSW) v Norman [1990] HCA 50; (1990) 171 CLR 182 (27 November 1990)	Mason CJ	0.98
Botany Municipal Council v Federal Airports Corporation ('*Third Runway Case*') [1992] HCA 52; (1992) 175 CLR 453; (1992) 79 LGERA 241 (28 October 1992)	Mason CJ	0.94
Bourke v State Bank of NSW [1990] HCA 29; (1990) 170 CLR 276 (28 June 1990)	Gaudron J Dawson J McHugh J Brennan J	0.26 0.23 0.22 0.07

132 Pierce, above n 8, 202–3.

133 For example, Deane J is well known as an architect of the expansion of constitutional freedoms on the Mason Court – see, eg, Pierce, above n 8, 209.

134 For example, Pamela Burton, *From Moree to Mabo: The Mary Gaudron Story* (Crawley, UWA Publishing, 2010) 275 quoting Michele Field, 'Advocate for the Good Fight', *Canberra Times* (Canberra), 28 March 1998, 3–4 quoting Geoffrey Robertson, who suggests that Mason CJ, Deane and Gaudron JJ were the 'standouts' on the Mason Court.

135 See Smyth, 'Who Gets Cited?', above n 33. In that article, see, for example, 241 Table 3 – Total Influence Scores – where Wilson J is the bottom half and Table 4 – Average Influence Scores – where Wilson J ranks mid-table. In contrast, in these tables, Deane J and Mason CJ tend to be ranked much closer to the top.

136 See, eg, Pierce, above n 8, 208–9, who suggests that, based on information from his interviewees, Deane, Gaudron and Toohey JJ were Mason CJ's main collaborators in the transformation of the Court under Mason CJ.

137 Peter Durack, 'Wilson, Ronald Darling' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 714.

Case Name	Prediction	Probability
Brown v West [1990] HCA 7; (1990) 169 CLR 195 (1 March 1990)	Brennan J Dawson J Mason CJ Gaudron J	0.20 0.18 0.17 0.10
Cheatle v The Queen [1993] HCA 44; (1993) 177 CLR 541 (26 August 1993)	Deane J	0.97
Dao v Australian Postal Commission [1987] HCA 13; (1987) 162 CLR 317 (14 April 1987)	Wilson J	0.83
Deputy Federal Commissioner of Taxation v State Bank of NSW [1992] HCA 6; (1992) 174 CLR 219 (25 February 1992)	McHugh J Gaudron J	0.38 0.30
Horta v Commonwealth [1994] HCA 32; (1994) 181 CLR 183; (1994) 68 ALJR 620; (1994) 123 ALR 1 (18 August 1994)	Deane J	0.80
Love v A-G (NSW) [1990] HCA 4; (1990) 169 CLR 307 (13 February 1990)	Gaudron J Brennan J	0.43 0.27
Ship 'Shin Kobe Maru' v Empire Shipping Company Inc [1994] HCA 54; (1994) 181 CLR 404 (9 November 1994)	Gaudron J	0.99
McWaters v Day [1989] HCA 59; (1989) 168 CLR 289 (5 December 1989)	McHugh J Gaudron J Toohey J Brennan J Dawson J	0.23 0.22 0.21 0.16 0.12
Port Macdonnell Professional Fishermen's Association Inc v South Australia [1989] HCA 49; (1989) 168 CLR 340 (26 October 1989)	Deane J Mason CJ Toohey J	0.30 0.29 0.11
Precision Data Holdings Ltd v Wills [1991] HCA 58; (1992) 173 CLR 167 (19 December 1991)	Mason CJ Brennan J	0.52 0.14
Re Wood [1988] HCA 22; (1988) 167 CLR 145 (12 May 1988)	Brennan J Gaudron J	0.56 0.11
Smith Kline & French Laboratories (Aust) Ltd v Commonwealth [1991] HCA 43; (1991) 173 CLR 194 (14 November 1991)	Mason CJ	0.73
Union Steamship Company of Australia Pty Ltd v King [1988] HCA 55; (1988) 166 CLR 1 (26 October 1988)	Mason CJ	0.96

D Other Joint Judgments of the Mason Court

To provide a more comprehensive picture of who was writing the joint judgments in the Mason Court, we examined the authorship of 119 additional judgments delivered in this court. Many of these judgments were less controversial than those explored above, and in 18 of these cases there were only three judges sitting on the bench. Our results appear in Table 6.

In 74 of the 119 cases (62 per cent), the probability associated with the top-ranked judge was greater than or equal to 0.6, leaving 45 lower-probability cases. In seven of the 119 cases, the classifier assigned the highest authorship probability to a judge who did not sit on the case.[138] In these cases, authorship was wrongly attributed to each of Brennan, Toohey, McHugh and Dawson JJ once, and to Wilson J three times. However, as noted in Table 6, these attributions were made with low probabilities (the highest probability was 0.53), and in all these cases, the second-ranked judge sat on the bench.[139] It is also worth noting that four of these wrong attributions were made in cases where the bench comprised only three judges. In total, there were 18 cases heard by a three-judge bench among the 119 cases in Table 6. Thus, the remaining 14 predictions in such cases attributed a judgment to a sitting judge – 10 of these predictions had a high-probability and four a low probability.[140]

Table 6: Other joint judgments of the Mason Court: cases with low-probability predictions are indicated in grey

Case Name	**Prediction**
Ahern v The Queen [1988] HCA 39; (1988) 165 CLR 87 (18 August 1988)	Dawson J
Austin v The Queen [1989] HCA 26; (1989) 166 CLR 669 (11 May 1989)	Dawson J Toohey J
Australia & New Zealand Banking Group Ltd v Westpac Banking Corporation [1988] HCA 17; (1988) 164 CLR 662 (21 April 1988)	Deane J
Australian Airlines Ltd v Commissioner of Stamp Duties (Qld) [1988] HCA 33; (1988) 79 ALR 425; (1988) 62 ALJR 429 (1 July 1988)	**Wilson J 0.52** Mason CJ 0.23
B v B [1988] HCA 66; (1988) 82 ALR 584; (1988) 63 ALJR 112 (8 December 1988)	Mason CJ Wilson J
Baumer v The Queen [1988] HCA 67; (1988) 166 CLR 51 (8 December 1988)	Wilson J
BHP Petroleum Pty Ltd v Balfour [1987] HCA 22; (1994) 180 CLR 474 (11 June 1987)	Toohey J
Blewitt v The Queen [1988] HCA 43; (1988) 80 ALR 353; (1988) 62 ALJR 503 (26 August 1988)	Mason CJ Toohey J
BP Australia Ltd v Bissaker [1987] HCA 24; (1987) 163 CLR 106 (24 June 1987)	Mason J

138 *Australian Airlines Ltd v Commissioner of Stamp Duties* (Qld) (1988) 79 ALR 425; **Gamester Pty Ltd v Lockhart* (1993) 112 ALR 623; *MacAlister v The Queen* (1990) 169 CLR 324; **National Australia Bank Ltd v Bond Brewing Holdings Ltd* (1990) 169 CLR 271; *Neil v Nott* (1994) 121 ALR 148; **Re Media, Entertainment & Arts Alliance; Ex parte Hoyts Corporation Pty Ltd* (1993) 112 ALR 193; **Williams v Spautz* (1993) 112 ALR 191. Cases in which the bench comprised three judges are asterisked (*).

139 In Table 6, for each case where the classifier attributed authorship to a judge who did not sit on the case, the judge's name is boldfaced, and the authorship probability for that judge and for the runner up is noted.

140 Our results were obtained while considering all the judges, regardless of whether they sat on a particular case. Under these conditions, predicting a top-ranked judge who sat on the bench for the vast majority of cases (94 per cent) provides reassurance for the validity of our methods.

Case Name	Prediction
Braund v Henning [1988] HCA 36; (1988) 79 ALR 417; (1988) 62 ALJR 433 (1 July 1988)	Wilson J Toohey J Dawson J
Browne v The Queen [1988] HCA 42; (1988) 80 ALR 358; (1988) 62 ALJR 506 (26 August 1988)	Mason CJ Dawson J
Bruce v The Queen [1987] HCA 40; (1987) 74 ALR 219; (1987) 61 ALJR 603 (8 September 1987)	Dawson J Wilson J
Canterbury Municipal Council v Moslem Alawy Society Ltd [1987] HCA 8; (1987) 162 CLR 145 (10 March 1987)	Deane J
Chester v The Queen [1988] HCA 62; (1988) 165 CLR 611 (6 December 1988)	Mason CJ
Comptroller of Stamps v Ashwick (Vic) No 4 Pty Ltd [1987] HCA 60; (1987) 163 CLR 640; (1987) 76 ALR 161; (1987) 62 ALJR 22 (10 December 1987)	Wilson J Mason J Toohey J
Criminale v State Authorities Superannuation Board [1989] HCA 48; (1989) 88 ALR 1; (1989) 63 ALJR 665 (26 October 1989)	Brennan J
Dao v Australian Postal Commission [1987] HCA 13; (1987) 162 CLR 317 (14 April 1987)	Wilson J
Deputy Federal Commissioner of Taxation v Moorebank Pty Ltd [1988] HCA 29; (1988) 165 CLR 55 (9 June 1988)	Deane J
Dickinson v Motor Vehicle Insurance Trust [1987] HCA 49; (1987) 163 CLR 500; (1987) 74 ALR 197; (1987) 61 ALJR 553 (13 October 1987)	Dawson J
Federal Commissioner of Taxation v Myer Emporium Ltd [1987] HCA 18; (1987) 163 CLR 199 (14 May 1987)	Mason CJ
Firmagroup Australia Pty Ltd v Byrne & Davidson Doors (Vic) Pty Ltd [1987] HCA 37; (1994) 180 CLR 483 (2 September 1987)	Brennan J
Hamilton v Whitehead [1988] HCA 65; (1988) 166 CLR 121 (7 December 1988)	Wilson J Toohey J McHugh J
Hoare v The Queen [1989] HCA 33; (1989) 167 CLR 348 (30 June 1989)	Deane J
Ibbs v The Queen [1987] HCA 46; (1987) 163 CLR 447 (6 October 1987)	Brennan J
Lamb v Cotogno [1987] HCA 47; (1987) 164 CLR 1 (13 October 1987)	Dawson J
M v M [1988] HCA 68; (1988) 166 CLR 69; (1988) 82 ALR 577; (1988) 63 ALJR 108 (8 December 1988)	Mason CJ
Macgroarty v Clauson [1989] HCA 34; (1989) 167 CLR 251 (30 June 1989)	Deane J
Maher v The Queen [1987] HCA 31; (1987) 163 CLR 221 (24 July 1987)	Brennan J Gaudron J
Mill v The Queen [1988] HCA 70; (1988) 166 CLR 59 (8 December 1988)	Wilson J Toohey J
National Australia Bank Ltd v KDS Construction Services Pty Ltd (in liq) [1987] HCA 65; (1987) 163 CLR 668; (1987) 76 ALR 27; (1987) 62 ALJR 63 (23 December 1987)	Mason CJ

Case Name	**Prediction**
Nicol v Allyacht Spars Pty Ltd [1988] HCA 48; (1988) 165 CLR 306 (27 September 1988)	Toohey J
Nile v Wood [1987] HCA 62; (1987) 76 ALR 91; (1987) 62 ALJR 52 (16 December 1987)	Toohey J
Nissho Iwai Australia Ltd v Malaysian International Shipping Corporation [1989] HCA 32; (1989) 167 CLR 219 (26 June 1989)	McHugh J
Northern Land Council v Commonwealth [1987] HCA 52; (1987) 75 ALR 210; (1987) 61 ALJR 616 (21 October 1987)	Mason CJ Gaudron J
Paringa Mining & Exploration Co plc v North Flinders Mines Ltd [1988] HCA 53; (1988) 165 CLR 452 (17 October 1988)	Brennan J Mason CJ
Pereira v DPP (NSW) [1988] HCA 57; (1988) 82 ALR 217; (1988) 63 ALJR 1; (1988) 35 A Crim R 382 (15 November 1988)	Gaudron J
Powch v The Queen [1987] HCA 41; (1987) 163 CLR 496; (1987) 75 ALR 13; (1987) 61 ALJR 611 (10 September 1987)	Brennan J
Prideaux v DPP (Vic) [1987] HCA 51; (1987) 163 CLR 483 (15 October 1987)	Brennan J
R v Lewis [1988] HCA 24; (1988) 165 CLR 12 (20 May 1988)	Wilson J Toohey J
Re Australian Bank Employees Union; Ex parte Citicorp Australia Ltd [1989] HCA 41; (1989) 167 CLR 513 (3 October 1989)	Gaudron J
Re Coldham; Ex parte Brideson [1989] HCA 2; (1989) 166 CLR 338 (7 February 1989)	Gaudron J
Re Cram; Ex parte NSW Colliery Proprietors' Association Ltd [1987] HCA 28; (1987) 163 CLR 117 (16 July 1987)	Mason CJ Gaudron J
Re Ranger Uranium Mines Pty Ltd; Ex parte Federated Miscellaneous Workers' Union of Australia [1987] HCA 63; (1987) 163 CLR 656; (1987) 76 ALR 36; (1987) 62 ALJR 47 (16 December 1987)	Gaudron J
Santos v The Queen [1987] HCA 55; (1987) 75 ALR 161; (1987) 61 ALJR 668; (1987) 29 A Crim R 122 (12 November 1987)	Mason J
Sola Optical Australia Pty Ltd v Judith Ann Mills [1987] HCA 57; (1987) 163 CLR 628; (1987) 75 ALR 513; (1987) 62 ALJR 3 (2 December 1987)	Wilson J
Steggles Pty Ltd v Vandenberg [1987] HCA 35; (1987) 163 CLR 321 (12 August 1987)	Mason CJ Brennan J
Swiss Aluminium Australia Ltd v Federal Commissioner of Taxation [1987] HCA 43; (1987) 163 CLR 421 (17 September 1987)	Mason CJ Toohey J
Walter v Council of Queensland Law Society Inc [1988] HCA 8; (1988) 77 ALR 228; (1988) 62 ALJR 153 (8 March 1988)	Wilson J Toohey J
Accident Compensation Commission v Odco Pty Ltd [1990] HCA 43; (1990) 95 ALR 641; (1990) 64 ALJR 606 (22 October 1990)	Mason CJ
Alexander Stenhouse Ltd v Austcan Investments Pty Ltd [1993] HCA 22; (1992) 7 ANZ Insurance Cases 61-166; (1993) 112 ALR 353; (1993) 67 ALJR 421 (21 April 1993)	Mason CJ Toohey J
Amatek Ltd v Googoorewon Pty Ltd [1993] HCA 16; (1993) 176 CLR 471 (18 March 1993)	Brennan J Dawson J

Case Name	Prediction
Amoe v DPP (Nauru) [1991] HCA 46; (1991) 103 ALR 595; (1991) 66 ALJR 29; (1991) 57 A Crim R 244 (3 December 1991)	McHugh J
A-G (NT) v Hand [1991] HCA 17; (1991) 172 CLR 185 (22 May 1991)	Toohey J
Australian Securities Commission v Marlborough Gold Mines Ltd [1993] HCA 15; (1993) 177 CLR 485; (1993) 10 ACSR 230; (1993) 112 ALR 627; (1993) 67 ALJR 517 (6 May 1993)	Mason CJ
Balog v Independent Commission Against Corruption [1990] HCA 28; (1990) 169 CLR 625 (28 June 1990)	Dawson J
Byrnes v Repatriation Commission [1993] HCA 51; (1993) 177 CLR 564; (1993) 30 ALD 1 (15 September 1993)	McHugh J
Carbone v The Queen [1989] HCA 57; (1989) 89 ALR 45; (1989) 64 ALJR 51 (5 December 1989)	Deane J Wilson J McHugh J
Commonwealth Bank of Australia v Quade [1991] HCA 61; (1991) 178 CLR 134; (1991) 102 ALR 487; (1991) 65 ALJR 674 (3 October 1991)	Deane J
Commonwealth v Genex Corporation Pty Ltd [1992] HCA 65; (1992) 176 CLR 277 (8 December 1992)	Toohey J Mason CJ
Dairy Farmers Co-op Ltd v Azar [1990] HCA 63; (1990) 170 CLR 293; (1990) 95 ALR 1; (1990) 64 ALJR 535; (1990) Aust Torts Reports 81-035; (1990) 34 IR 40 (5 September 1990)	Toohey J
Daniels v Burfield [1994] HCA 35; (1994) 125 ALR 33; (1994) 68 ALJR 894 (9 November 1994)	McHugh J Wilson J
Dedousis v Water Board [1994] HCA 57; (1994) 181 CLR 171 (16 November 1994)	McHugh J
Dimozantos v The Queen (No 2) [1993] HCA 52; (1993) 178 CLR 122; (1993) 67 A Crim R 447 (22 September 1993)	Deane J
Dimozantos v The Queen [1992] HCA 49; (1992) 174 CLR 504; (1993) 63 A Crim R 132 (7 October 1992)	Brennan J Dawson J Toohey J
Doney v The Queen [1990] HCA 51; (1990) 171 CLR 207 (27 November 1990)	Gaudron J
Federal Commissioner of Taxation v Peabody [1994] HCA 43; (1994) 181 CLR 359; (1994) 123 ALR 451; (1994) 28 ATR 344; (1994) 94 ATC 4663 (28 September 1994)	Dawson J
Federal Commissioner of Taxation v Prestige Motors Pty Ltd [1994] HCA 39; (1994) 181 CLR 1; (1994) 64 ALJR 634; (1994) 94 ATC 4570; (1994) 28 ATR 336; (1994) 123 ALR 306 (7 September 1994)	Mason CJ Brennan J
Federal Commissioner of Taxation v Totalisator Administration Board of Queensland ('*Queensland TAB Case*') [1990] HCA 48; (1990) 170 CLR 508; (1990) 96 ALR 321; (1990) 65 ALJR 17 (22 November 1990)	Gaudron J
Ferrcom Pty Ltd v Commercial Union Assurance Company of Australia Ltd [1993] HCA 5; (1993) 176 CLR 332; (1993) 111 ALR 339; (1993) 67 ALJR 264 (17 February 1993)	Brennan J
Fletcher v Federal Commissioner of Taxation [1991] HCA 42; (1991) 173 CLR 1 (14 November 1991)	Deane J

Case Name	Prediction
Gamester Pty Ltd v Lockhart [1993] HCA 79; (1993) 112 ALR 623; (1993) 67 ALJR 547 (12 May 1993)	**Toohey J 0.32** Brennan J 0.20
Gaye (No 1) Pty Ltd v Allan Rowlands Holdings Pty Ltd [1993] HCA 26; (1993) 114 ALR 349; (1993) 67 ALJR 682 (30 June 1993)	Toohey J
George v Rockett [1990] HCA 26; (1990) 170 CLR 104 (20 June 1990)	Brennan J
GP International Pipecoaters Pty Ltd v Federal Commissioner of Taxation [1990] HCA 25; (1990) 170 CLR 124 (20 June 1990)	Brennan J Mason CJ
Gye v McIntyre [1991] HCA 60; (1991) 171 CLR 609 (1 March 1991)	Deane J
H v The Queen [1994] HCA 59; (1994) 69 ALJR 22 (17 November 1994)	Toohey J Dawson J
Harmer v Federal Commissioner of Taxation [1991] HCA 51; (1991) 173 CLR 264 (12 December 1991)	Deane J Brennan J
Hawkins v The Queen [1994] HCA 28; (1994) 179 CLR 500; (1994) 122 ALR 27; (1994) 68 ALJR 572; (1994) 72 A Crim R 288 (29 June 1994)	Brennan J
Hawkins v The Queen [1994] HCA 47; (1994) 181 CLR 440; (1994) 124 ALR 366 (14 October 1994)	Mason CJ
Independent Order of Odd Fellows of Victoria v Federal Commissioner of Taxation [1991] HCA 55; (1992) 173 CLR 417 (19 December 1991)	Brennan J Dawson J
K B Hutcherson Pty Ltd v Correia [1995] HCA 70; (1995) 69 ALJR 280; (1995) 183 CLR 50 (16 March 1995)	Toohey J
Leeth v The Queen [1992] HCA 67; (1992) 67 ALJR 167; (1992) 110 ALR 459 (16 December 1992)	Brennan J Toohey J
MacAlister v The Queen [1990] HCA 15; (1990) 169 CLR 324 (12 April 1990)	**Brennan J 0.53** McHugh J 0.36
MBP (SA) Pty Ltd v Gogic [1991] HCA 3; (1991) 171 CLR 657 (26 February 1991)	McHugh J
McAuliffe v The Queen [1995] HCA 37; (1995) 69 ALJR 621; (1995) 130 ALR 26; (1995) 183 CLR 108 (28 June 1995)	Dawson J Toohey J
McDonald v Commissioner of Business Franchises [1992] HCA 59; (1992) 175 CLR 472 (25 November 1992)	Brennan J
Medved v Dunlop Olympic Ltd [1991] HCA 57; (1991) 104 ALR 340; (1991) 66 ALJR 178 (19 December 1991)	Dawson J McHugh J Toohey J Mason CJ
Minister for Immigration and Ethnic Affairs v Tang [1994] HCA 31; (1994) 69 ALJR 8; (1994) 125 ALR 203 (16 November 1994)	Toohey J
Mount Isa Mines Ltd v Federal Commissioner of Taxation [1992] HCA 62; (1992) 176 CLR 141 (2 December 1992)	Mason CJ
Munnings v Australian Government Solicitor [1994] HCA 12; (1994) 120 ALR 586; (1994) 68 ALJR 429 (20 April 1994)	Toohey J

Case Name	Prediction
National Australia Bank Ltd v Bond Brewing Holdings Ltd [1990] HCA 10; (1990) 169 CLR 271 (28 March 1990)	**Wilson J 0.27** Brennan J 0.22
Neil v Nott [1994] HCA 23; (1994) 121 ALR 148; (1994) 68 ALJR 509 (1 June 1994)	**Wilson J 0.33** Brennan J 0.22
Official Receiver In Bankruptcy v Schultz [1990] HCA 45; (1990) 170 CLR 306 (8 November 1990)	Brennan J Gaudron J
Park v Minister for Immigration and Ethnic Affairs [1989] HCA 54; (1989) 167 CLR 637 (21 November 1989)	Deane J
Pitkin v The Queen [1995] HCA 30; (1995) 69 ALJR 612; (1995) 130 ALR 35 (28 June 1995)	Deane J
R v Murphy [1990] HCA 42; (1990) 95 ALR 493; (1990) 64 ALJR 593 (3 October 1990)	Gaudron J
Re Alcan Australia Limited; Ex parte Federation of Industrial Manufacturing & Engineering Employees [1994] HCA 34; (1994) 181 CLR 96; (1994) 68 ALJR 626; (1994) 123 ALR 193 (25 August 1994)	Gaudron J
Re Anti-Cancer Council of Victoria; Ex parte State Public Services Federation [1992] HCA 53; (1992) 175 CLR 442 (28 October 1992)	Gaudron J
Re Australasian Meat Industry Employees' Union; Ex parte Aberdeen Beef Co Pty Ltd [1993] HCA 17; (1993) 176 CLR 154 (18 March 1993)	McHugh J
Re Australian Industrial Relations Commission; Ex parte Australian Transport Officers Federation [1990] HCA 52; (1990) 171 CLR 216 (4 December 1990)	Mason CJ
Re Australian Railways Union; Ex parte Public Transport Corporation [1993] HCA 28; (1993) 117 ALR 17; (1993) 67 ALJR 904 (20 October 1993)	Dawson J Brennan J
Re Coldham; Ex parte Brideson (No 2) [1990] HCA 36; (1990) 170 CLR 267 (22 August 1990)	McHugh J
Re Construction Forestry Mining Energy Union; Ex parte W J Deane & Sons Pty Ltd [1994] HCA 53; (1994) 181 CLR 539 (9 November 1994)	Mason CJ Toohey J
Re Finance Sector Union of Australia; Ex parte Illaton Pty Ltd [1992] HCA 30; (1992) 107 ALR 581; (1992) 66 ALJR 583 (25 June 1992)	Deane J
Re Media Entertainment & Arts Alliance; Ex parte Hoyts Corporation Pty Ltd [1993] HCA 18; (1993) 112 ALR 193; (1993) 67 ALJR 389 (18 March 1993)	**McHugh J 0.28** Mason CJ 0.16
Re Media Entertainment & Arts Alliance; Ex parte Hoyts Corporation Pty Ltd [No 2] [1994] HCA 66; (1994) 119 ALR 206 (9 February 1994)	Gaudron J
Re Polites; Ex parte Hoyts Corporation Pty Ltd [1991] HCA 25; (1991) 100 ALR 634; (1991) 65 ALJR 445 (20 June 1991)	Gaudron J
Robinson v The Queen [1991] HCA 38; (1994) 180 CLR 531 (1 October 1991)	McHugh J
Rodway v The Queen [1990] HCA 19; (1990) 169 CLR 515 (24 May 1990)	Dawson J Brennan J
Rowella Pty Ltd v Abfam Nominees Pty Ltd [1989] HCA 65; (1989) 168 CLR 301 (21 December 1989)	Brennan J

Case Name	**Prediction**
Savvas v The Queen [1995] HCA 29; (1995) 129 ALR 319; (1995) 69 ALJR 564; (1995) 183 CLR 1 (1 June 1995)	Toohey J
Scott v Sun Alliance Australia Ltd [1993] HCA 46; (1993) 178 CLR 1 (26 August 1993)	McHugh J
Shop Distributive & Allied Employees Association v Minister for Industrial Affairs [1995] HCA 11; (1995) 129 ALR 191; (1995) 69 ALJR 558; (1995) 183 CLR 552 (10 May 1995)	Dawson J Brennan J
Stingel v The Queen [1990] HCA 61; (1990) 171 CLR 312 (20 December 1990)	Deane J
Sydney City Council v Garbett Pty Ltd [1995] HCA 2; (1995) 69 ALJR 616; (1995) 130 ALR 41 (28 June 1995)	McHugh J
Ugle v The Queen [1989] HCA 55; (1989) 167 CLR 647 (21 November 1989)	Gaudron J Toohey J
Wakeley & Bartling v The Queen [1990] HCA 23; (1990) 93 ALR 79; (1990) 64 ALJR 321 (7 June 1990)	Toohey J
Warman International Ltd v Dwyer [1995] HCA 18; (1995) 182 CLR 544; (1995) 128 ALR 201; (1995) 69 ALJR 362 (23 March 1995)	Deane J Gaudron J
Williams v Spautz [1993] HCA 9; (1993) 112 ALR 191; (1993) 67 ALJR 388 (11 March 1993)	**Dawson J 0.53** Brennan J 0.15

Table 7 summarises the authorship attributions for the 112 cases where the top-ranked judge sat on the bench, and provides a breakdown of the attributions for the 74 high-probability cases and the 38 low-probability cases. Note that, of all the judgments attributed to a judge, Gaudron, Toohey and McHugh JJ had the highest proportion of high-probability attributions, while only about half of Mason CJ's and Brennan J's judgments have a high probability. As mentioned above, these probabilities may be indicative of the collaborative effort involved in the different judgments.

Table 7: Authorship attribution for 112 cases where the top-ranked judge sat on the bench for high- and low-probability cases

Judge	Mason CJ	Brennan J	Deane J	Toohey J	Gaudron J	Dawson J	McHugh J	Wilson J
All (112)	21	18	16	13	12	12	11	9
High probability	11	10	13	11	11	5	10	3
Low probability	10	8	3	2	1	7	1	6

Overall, the findings for *Cole v Whitfield,* the *Newspaper Rule Case* and the *Spycatcher Case*, the 10 unanimous judgments in constitutional cases for which the probability of attribution is high, and the other 112 joint judgments for which our classifier attributed authorship to a judge who sat on the case, lend support to the idea that Mason CJ, Brennan and Deane JJ did much of the heavy lifting in the most important joint judgments of the Mason Court. Our findings suggest that between them, Mason CJ and Deane J were responsible for 10 of the 13

judgments in *Cole v Whitfield,* the *Newspaper Rule Case*, the *Spycatcher Case* and the 10 high-probability constitutional cases in Table 5. In Table 7, Mason CJ, Brennan and Deane JJ, together, are credited with writing just under one half of the 112 judgments, and 46 per cent of the judgments for which authorship can be attributed with high probability.

One might expect there to be evidence of division of labour, ie, a particular judge might more often write the joint judgment in cases concerning topics in which he or she has an interest or particular expertise.[141] However, there is little evidence of this in the most discriminating features used by the classifier. Firstly, half of the features are part-of-speech n-grams (the 15 most discriminative features for Mason CJ are listed in the bottom part of Table 2, and for the other judges in Table A3 in Appendix III). Secondly, very few of the token-based features (top part of Table 2 for Mason, and Table A2 in Appendix II for the other judges) are topical words, eg, Table 2 shows only two potentially topical words for Mason CJ: 'industry' and 'taxation'. In addition, there is not much evidence of division of labour with respect to the subject areas that constituted the relatively larger shares of the 112 cases in Table 7. There are 24 cases concerning criminal law in the sample, representing just over a fifth of the total cases. Our SVM classifier attributed at least one of the joint judgments in these criminal cases to each of the eight members of the Mason Court, with Brennan J (seven) and Mason CJ (five) being credited with the most cases. There are 11 cases in the sample concerned with taxation, representing just over 10 per cent of cases, of which all members of the Court, except McHugh and Wilson JJ, were credited with at least one of the joint judgments. The other main group of cases falls under the broad rubric of statutory interpretation. There are nine cases in this area, of which our classifier attributed at least one joint judgment to each member of the Court, except Wilson J.

One topic on which a division of labour is apparent is labour relations law. There are 10 cases in the sample concerned with this topic, with Gaudron J being credited with five of the joint judgments, Mason CJ with three and McHugh J with two. The findings for Gaudron and McHugh JJ are consistent with their longstanding interest, and expertise, in this area.[142] While the number of cases is small, our classifier attributed to Deane J the joint judgments in the two equity

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141 For example, in the United Kingdom Supreme Court, Alan Paterson, *Final Judgment: The Last Law Lords and the Supreme Court* (Hart Publishing, 2013) points out that expertise plays a role in the allocation of judgment writing duties: at 91. Similarly, in the United States Supreme Court issue specialisation plays an important role in the allocation of opinion writing: see, eg, Forrest Maltzman and Paul J Wahlbeck, 'May it Please the Chief? Opinion Assignments in the Rehnquist Court' (1996) 40 *American Journal of Political Science* 421, 427, 430; Paul J Wahlbeck, 'Strategy and Constraints on Supreme Court Opinion Assignment' (2006) 154 *University of Pennsylvania Law Review* 1729, 1735–6.

142 At the Bar, Gaudron J's practice was focused on labour relations law and prior to joining the High Court, she served as Deputy President of the Arbitration Commission. Since retiring from the High Court, she was a member of the ILO's Administrative Tribunal – see Burton, above n 134; Henrik Kalowski, 'Gaudron, Mary Genevieve' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 293. At the Bar, McHugh J had a substantial practice in labour relations law – see Kate Guilfoyle, 'McHugh, Michael Hudson' in Tony Blackshield, Michael Coper and George Williams (eds), *The Oxford Companion to the High Court of Australia* (Oxford University Press, 2001) 464.

cases and two of the four administrative cases in the sample,[143] reflecting his expertise and interest in these areas.[144]

VI CONCLUSION

While there have been ebbs and wanes between joint and single-authored judgments throughout the history of the High Court, during the Mason Court the joint judgment was in clear ascendancy.[145] While the joint judgment clearly has its advantages in that it provides clear and stable precedent, there is an inherent trade-off at play, where an element of judicial transparency and accountability is lost when multiple judges put their name to a judgment which is most likely written by only one judge. As Justice Kiefel described it, in the passage quoted at the start of this article, the judge who authors the judgment can feel a 'loss of identity' when others sign on.[146]

Computational linguistics provides lawyers with an opportunity to gain back some transparency over judicial authorship, while still allowing judges to deliver judgments jointly, which increases certainty in the law. However, it is important to be aware of the limitations of this study. One limitation is that computational linguistics is rarely 100 per cent accurate, but we have reason to believe that the results of our study are highly reliable due to the following reasons: (a) the predictions of our SVM classifier agreed in all cases with those made by the logistic-regression classifier we used for validation; (b) in only seven of the 140 cases we examined, the top-ranked judge predicted by our classifier did not sit on the case – in all these seven cases, the judge in question was nominated with a low probability, and the second-ranked judge sat on the case; and (c) we can distinguish between high- and low-probability predictions, and for the latter, we can identify additional judges who likely contributed to a judgment. Clearly, the mere fact that a judge sat on a case does not imply with 100 per cent surety that this judge authored the judgment for this case. However, it provides reassurance about the validity of our classifier's predictions, which is reinforced by the predictions made for the three-judge panels that decided 18 of the cases reported in Table 6 – in 78 per cent of these cases, the top-ranked predicted judge was one of the three sitting judges, rather than one of the other five judges. Having said that, further investigation is required about the meaning of a classifier's low-probability predictions, in order to determine whether they reflect a collaborative effort or just uncertainty. In the meantime, a cautious approach would be warranted, whereby the high-probability predictions are heeded.

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143 *Australia and New Zealand Banking Group Ltd v Westpac Banking Corporation* (1988) 164 CLR 662; *Warman International Ltd v Dwyer* (1995) 182 CLR 544 (equity); *Canterbury Municipal Council v Moslem Alawy Society Ltd* (1987) 162 CLR 145; *Park v Minister for Immigration and Ethnic Affairs* (1989) 167 CLR 637 (administrative law).

144 See Pierce, above n 8, 209; Atherton et al, above n 131.

145 See Groves and Smyth, above n 4, 267 Figure 2.

146 See Kiefel, above n 1, 557.

A second limitation of our study is that the analysis does not give a full picture of the many judges and associates whose views might influence a decision. It may not be 'a judge' that drives forward a joint judgment of the Court, but a dominant duo or partnership. One thinks, for instance, of Gummow and Hayne JJ as a likely example in the years since the Mason Court. There may not have been anything equivalent on the Mason Court, though Deane and Toohey JJ are perceived as regular fellow travellers. As Sir Anthony Mason has described one of the key limitations of attempts at authorship attribution:

> It is often possible to identify the principal author of a joint judgment by reference to literary style – or lack of it. Identifying the principal author does not, however, exclude the possibility that other members of the 'plurality', to use a detestable word, have contributed to its content.[147]

A third potential limitation is that we have considered each judgment as a unit of text, while it is possible that Justice X might write one part of the judgment and Justice Y another. This is a possible explanation for the lower-probability judgments summarised in Table 7 (also highlighted in Table 6). As mentioned above, considering components of judgments separately is a new area of research which would shed additional light on authorship attribution results.[148]

Bearing these limitations in mind, we believe that computational linguistics is a useful and valuable tool that brings us closer to understanding who wrote key decisions in the Court's history. Overall, we have applied computational linguistics to attribute authorship to 140 joint judgments from the Mason Court, each of which was signed by all (or almost all) of the judges hearing the case. The results confirm that much of the intellectual leadership of the Mason Court in the most important unanimous decisions of the period (*Cole v Whitfield,* the *Newspaper Rule Case* and the *Spycatcher Case*) and the 10 high-probability constitutional cases in Table 5 was provided by Mason CJ and Deane J. Beyond these joint judgments in notable cases, there is a more even spread of authorship of joint judgments in less noteworthy cases, although Mason CJ and Deane J, along with Brennan J, feature prominently in the authorship attribution of the 112 cases in Table 7.

There is a growing number of studies that employ computational linguistics to ascertain the authorship of landmark decisions in United States courts. This study, along with the earlier study examining the extent to which Dixon J ghosted for McTiernan and Rich JJ,[149] can be considered starting points for using computational linguistics to better understand authorship of judgments in Australian courts. Future research could examine attribution of authorship in joint judgments in other eras of the High Court's history, such as the French Court,[150] or for other Australian courts. What can be done with our analysis? If

147 See Mason, 'Reflections on the High Court', above n 1, 109.

148 See Statamatos et al, above n 84.

149 See Seroussi, Smyth and Zukerman, above n 92.

150 For speculation that French CJ and Gummow J authored most of the joint judgments on the French Court see Jack Waterford, 'Judges Rest their Writing Hands', *The Sydney Morning Herald* (online), 7 April 2012 <http://www.smh.com.au/federal-politics/judges-rest-their-writing-hands-20120406-1wgbl.html>. More recently, at the ceremonial sitting to farewell Hayne J, French CJ stated that Hayne J 'ha[d] written 412 judgments, 400 of them in Full Court matters. Many of them have been published as judgments in

combined with other future studies for other eras in the Court's history, as we have argued above, the results may be useful to scholars studying the reputation, and influence, of judges based on citations to judgments. As such, the analysis contained in this paper has the potential to better understand who was shaping the development of the common law on the Mason Court. The analysis also contributes to our understanding of the 'behind the scenes of judgment writing' on the Mason Court more generally. It is reasonable to conclude that those attributed with writing the most important judgments of the period and, in particular, Mason CJ and Deane J, were important players in influencing opinion on the Mason Court. These judges were clearly very influential behind the scenes, given that in a disproportionate number of the most important cases, the rest of the Court signed on with their judgment.

From a consumer perspective, to the extent that the author of a judgment may signify quality, analysis such as that offered in this article saves time to users of law reports by enabling them to select joint judgments attributed to authors who have reputations for writing high-quality judgments. In this sense, analysis such as this helps to clarify the relationship between who writes a judgment and the extent to which it is read, and cited, in subsequent cases and in academic articles. Finally, analysis such as this helps to address the loss of identity that some judges feel when they author a judgment in which other judges join. To the extent that judges are motivated by such considerations, attributing authorship may help to promote the joint judgment, in the sense that the author of such a judgment can be part of a joint judgment of the Court in which his or her colleagues agree, and still be recognised as the author.

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which other members of the Court have joined': Transcript of Proceedings, *Ceremonial – Farewell to Hayne J – Canberra* [2015] HCATrans 105 (13 May 2015) (French CJ) – see the discussion of French CJ's comments in Andrew Lynch and George Williams, 'The High Court on Constitutional Law: The 2015 Statistics' (2016) 39 *University of New South Wales Law Journal* 1161, 1162.

VII APPENDICES

I Table A1: Part-of-speech tags from the Penn Tree Bank

#	Tag	Description	#	Tag	Description
1	CC	Coordinating conjunction	19	PRP$	Possessive pronoun
2	CD	Cardinal number	20	RB	Adverb
3	DT	Determiner	21	RBR	Adverb, comparative
4	EX	Existential *there*	22	RBS	Adverb, superlative
5	FW	Foreign word	23	RP	Particle
6	IN	Preposition or subordinating conjunction	24	SYM	Symbol
7	JJ	Adjective	25	TO	*To*
8	JJR	Adjective, comparative	26	UH	Interjection
9	JJS	Adjective, superlative	27	VB	Verb, base form
10	LS	List item marker	28	VBD	Verb, past tense
11	MD	Modal	29	VBG	Verb, gerund or present participle
12	NN	Noun, singular or mass	30	VBN	Verb, past participle
13	NNS	Noun, plural	31	VBP	Verb, non-3rd person singular present
14	NNP	Proper noun, singular	32	VBZ	Verb, 3rd person singular present
15	NNPS	Proper noun, plural	33	WDT	Wh-determiner
16	PDT	Pre-determiner	34	WP	Wh-pronoun
17	POS	Possessive ending	35	WP$	Possessive wh-pronoun
18	PRP	Personal pronoun	36	WEB	Wh-adverb

II Table A2: List of the 15 most discriminative token n-gram features according to presence and frequency for each judge

	Token N-gram Presence			Token N-gram Frequency		
Judge	**Unigram**	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
Mason	respective, at, though, show, stated, who	the respective, that view, to consider, show that, to show, stated by, is not, of that	to show that	at, to, had, subject, industry, view, what, might, and, liable, taxation	and the, to that, to be, might be	
Dawson	whilst, being, application, extended, moreover, basis, up, property	that reason, for that, this case, as it	upon the basis, for that reason, in this case	partnership, being, upon, any, it, no, missing, reason, during, its, but, extended, whilst	for that, this case	
Toohey	context, about, comments	that regard, the reason, the context, is however, that being, being so, the result, about the	in that regard, that being so, the reason that, for the reason	that, upon, context, which, however, or, of, majority, one, other	in the, the context, that it, context of	the context of
Gaudron	involving, thus, set, matters, provided, issue, viewed, context, appropriate	is also, and thus, that they, question arises, by reference	As to the, by reference to	also, see, issue, thus, that, although, cases, provision, orders, relation, on	to the, by reference, on the	by referenc e to
Deane	circumstance, we, according, footing, except, here	which have, according to, it has, the provisions, the two, question which	in the result, of the two, the ground that	this, on, provisions, these, been, security, two, it, say, an	that the, in the, on the, and that, is that	

	Token N-gram Presence			Token N-gram Frequency		
Judge	**Unigram**	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
McHugh	contrary, facts, unless, consequently, concerning, are, established, other, those	question in, are the, contrary to, in this, and not, concerning the, facts and		those, business, if, license, an, or, this, are, when, on, missing, out, only, but	the business	
Brennan	reaching, honour, approach, term	that conclusion, said in, about the, this aspect, is said, state of, the court, the term, general for	before the court, the court in	but, not, is, where, authorities, there, test, said, does, review, acquisition	in the, to the, it is	as to the
Wilson	add, opinion, prepared, have, proper, support	in any, my opinion, as amended, advantage of, the advantage, have had, any event	in my opinion, in any event	have, add, decision, opinion, dispute, respect, would, may, present, circumstances, such, support	in my, is to	is to be

III Table A3: List of the 15 most discriminative part-of-speech n-gram features according to presence and frequency for each judge

	PoS N-gram Presence			PoS N-gram Frequency		
Judge	**Unigram**	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
Mason	LS	LS DT, NN LS, LS IN, CD PRP, CD CD	LS DT NN, DT NN CD, CD DT JJ, NN LS DT, DT NN LS, DT VBG IN, NN CD DT, PRP NN NN, CD CD DT	WP, LS, CD	JJ TO, NNP VBD, TO VB, NN LRB, VBN RB, VBN VBN, CD DT, LRB IN, LS DT	JJ TO VB, VBN IN DT, DT NNP IN
Dawson		VBG VBN, MD TO, IN NNS	IN PRP IN, VBP IN NNP, NN IN NNS, VBG NN TO, WDT PRP VBZ, NN VB NNP, RB VB NN, MD RB IN, NNS WDT PRP, WRB PRP VBZ, NN WDT PRP, VBZ IN NN	WDT, SYM	IN NNS, NN CC, VBG VBN, SYM CD, PRP IN	NNS IN DT, NN IN NNS, VBP IN NNP, DT NN TO, VB DT JJ, IN DT NN, CD LRB CD, NNP NNP VBZ
Toohey	FW	VB FW, MD IN, FW NNP, VBG RB, LRB FW	DT VBG RB, VB FW NNP, IN WP VBZ, IN NNS WRB, IN VBZ VBN, IN JJ JJ, VB RB VBN, VBZ TO PRP, IN PRP VBP	POS, WDT, JJ	VBD VBN, JJ JJ, NN NN, RB VBN, NNP POS	DT NN IN, NNP NNP NNP, JJ NN IN, NNP CD IN, DT VBN NN, NN IN DT, DT NNS IN
Gaudron		WDT NN, LRB VBG, IN VBZ, RB NNS	IN RB VBN, CC RB RB, IN VBN IN, NN VBZ CC, NN VB VBN, IN TO DT, NN IN VBZ, RB IN NN, NNS VBG DT, VBP IN PRP, IN NNS VBG	RB, CC, EX	IN IN, NN VB, VBN IN, NNS VBP, NNS VBG	VBN IN NN, VBD VBN IN, NNP NNP NNP, NNP CD NNP, TO VB DT, VBN IN DT, VB VBN IN

	PoS N-gram Presence			PoS N-gram Frequency		
Judge	**Unigram**	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
Deane		LRB VB	JJ NNP CD, DT CD NNS, IN JJ NNP, VBG IN PRP, NN WDT PRP, LRB VB NNP, VBG TO PRP, WDT PRP VBP, NN VBZ TO, IN RB RB, NN RB VBN, NN RB NNP, PRP VBP VBN, IN NNS VBG	TO	JJ NNP, WDT PRP, VB PRP, VBZ IN, IN RB	VBZ IN DT, DT NN VBZ, VBD IN DT, JJ NNP CD, IN JJ NNP, DT CD NNS, VBD VBN IN, PRP VBZ RB
McHugh		DT VBN, NN VBP	JJ NNS DT, PRP CC PRP, NN RB NNP, VBD IN IN, NNP VBD RP, RB DT NNP, NNP VBD LRB, NN VBP DT, RB IN JJ, NN RB DT, VBD IN PRP, VBP RB JJ, IN PRP CC	DT	IN PRP, NN MD, NNP VBD, DT VBN, NN VBP, NNS IN, WDT VBP	VB IN DT, NN MD VB, NNP NNP NNP, VB DT NNS, PRP CC PRP, VB DT NNS, PRP CC PRP
Brennan			CD RRB JJ, PRP NNP IN, PRP NNP POS, CC PRP VBP, VBP IN NNP, VBZ CD NN, CC IN IN, IN NN EX, NNS VBP IN, CD NN VBN, VBN CC PRP, RB VB WP, VB WP VBZ, TO PRP NNP, WP VBZ VBN	VBZ, EX, RB, JJR	VBZ JJ, IN WDT, NN DT	NNP NNP VBD, DT NN DT, NN DT NN, IN NN NN, PRP VBZ JJ, VBZ DT NN, VBZ JJ TO, DT NN IN

	PoS N-gram Presence			**PoS N-gram Frequency**		
Judge	**Unigram**	**Bigram**	**Trigram**	**Unigram**	**Bigram**	**Trigram**
Wilson		VBP VBD, TO NN, PRP NNP, NNP PRP	RRB IN VBN, VBP VBD DT, PRP VBP VBD, NN PRP VBP, VBG DT NNS, PRP NN DT, TO PRP IN, PRP VBP RB, PRP NNP IN, PDT DT NN, PRP VBZ TO	PRP	VBZ TO, PRP VBP, VBN PRP, VB PRP, CD IN, JJ IN	MD VB JJ, VBZ TO VB, NNS IN NN, DT NN PRP, DT NN VBZ, TO VB VBN, NN PRP VBD, CC IN DT