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ARTICLE

## Hierarchy, Race, and Gender in Legal Scholarly Networks

Keerthana Nunna, W. Nicholson Price II & Jonathan Tietz\*

**Abstract.** A potent myth of legal academic scholarship is that it is mostly meritocratic and mostly solitary. Reality is more complicated. In this Article, we plumb the networks of knowledge co-production in legal academia by analyzing the star footnotes that appear at the beginning of most law review articles. Acknowledgments paint a rich picture of both the currency of scholarly credit and the relationships among scholars. Building on others' prior work characterizing the potent impact of hierarchy, race, and gender in legal academia more generally, we examine the patterns of scholarly networks and probe the effects of those factors. The landscape we illustrate is depressingly unsurprising in basic contours but awash in details. Hierarchy, race, and gender all have substantial effects on who gets acknowledged and how, what networks of knowledge co-production get formed, and who is helped on their path through the legal academic world.

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## Introduction

The traditional myth of legal scholarship is that it is largely meritocratic and largely solitary.<sup>1</sup> Under such a view, what gets you ahead is simply a good idea: a head-turning paper that generates a whirlwind of citations and chatter purely through its brilliance. Under such a view, demographic considerations like an author's race, gender, and academic pedigree should matter little in the marketplace of ideas. That myth may comfort those who ended up atop the tower, but it is belied by reality.<sup>2</sup> Hierarchy, race, and gender matter to a legal academic's success; they matter to the acceptance of her ideas; they matter to her own experience.

Against a rich backdrop of theoretical and qualitative work examining these issues, we present here a quantitative study of one way to observe the impact of hierarchy, race, and gender: the acknowledgments sections of law review footnotes and what they can tell us about legal scholarly networks. The author footnote—variously known as the star, dagger, biographical, vanity, or bug footnote—gives a peek into who contributed (nominally, at least) to the intellectual product that is the final, published law review article. Footnotes provide small, partial portraits of the author's professional and social networks. Taken in the aggregate, these footnotes give a peek (cloudy, to be sure) into the underlying relationships, interactions, and social networks that make up legal academia. And we can examine that picture for signs of the effects of hierarchy, race, and gender to see whether those characteristics show up in a quantitatively observable fashion. (Spoiler alert: They do.)

Here, we examine the star footnotes of nearly 30,000 law review articles published in generalist law journals over nearly a decade. We probe who acknowledges whom, how school rank matters, and what racial and gender-based disparities exist in who gets asked for help or who gets credit (it's hard to

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1. See, e.g., Meera E. Deo, *The Ugly Truth About Legal Academia*, 80 BROOK. L. REV. 943, 953 (2015); Jonathan I. Tietz & W. Nicholson Price II, Commentary, *Acknowledgments as a Window into Legal Academia*, 98 WASH. U. L. REV. 307, 312-16 (2020) (exploring the single-author myth); *id.* at 330-31 (explaining that knowledge co-production in legal academia is broader than the single-author dominance would imply); Lucille A. Jewel, *Bourdieu and American Legal Education: How Law Schools Reproduce Social Stratification and Class Hierarchy*, 56 BUFF. L. REV. 1155, 1173-75, 1193-96 (2008) (discussing "the myth of merit"). See generally POWER, LEGAL EDUCATION, AND LAW SCHOOL CULTURES (Meera E. Deo, Mindie Lazarus-Black & Elizabeth Mertz eds., 2020) (exploring the "myth" that law professors are "selected and promoted based on merit").
  2. See generally POWER, LEGAL EDUCATION, AND LAW SCHOOL CULTURES, *supra* note 1. See, e.g., MEERA E. DEO, UNEQUAL PROFESSION: RACE AND GENDER IN LEGAL ACADEMIA 6 (2019); Jewel, *supra* note 1, at 1195. The myth may comfort those *not* atop the tower, too, as "individuals who are disadvantaged or lack privilege tend not to challenge the status quo, as many believe that the existing structure is normal, unavoidable, and based on merit." Deo, *supra* note 1, at 953.

tell) in scholarly papers. We freely admit that the operative mechanism is hard to discern: We have no ready way to tell, for instance, whose comments at conferences get thanked and whose don't, or who has time and funding to attend conferences in the first place.<sup>3</sup> But we do what we can with the data we have. Not to hide the ball: We find that authors tend to acknowledge scholars from peer schools, most of all their own school, but also typically acknowledge folks from somewhat fancier schools.<sup>4</sup> We find that men are acknowledged more than women and nonbinary scholars,<sup>5</sup> and white scholars more than scholars of color.<sup>6</sup> We examine intersectional effects, which are complex—read on to find out more.<sup>7</sup> One bright spot here: Networks of scholars of color appear to be particularly robust.<sup>8</sup>

We also look to one subcommunity to see whether patterns change. We examine the network of scholars working in technology and intellectual property law (“tech/IP”), an unwieldy but meaningful classification, as a specialist group that we might expect to interact meaningfully within itself (and with which we are most familiar).<sup>9</sup> Surprisingly, nearly half of acknowledgments by tech/IP scholars are to scholars outside the field.<sup>10</sup> But even within a subcommunity known to be friendly and welcoming, pernicious effects persist; white tech/IP scholars are acknowledged much more than tech/IP scholars of color.<sup>11</sup>

These results cast more light on the problems of inequality pervasive throughout the legal academy. Our findings are not definitive answers, but provide some quantitative evidence to add to the growing body of scholarship in the area.

This Article proceeds in four Parts.<sup>12</sup> Part I provides some scholarly background in the field. Part II presents our methods, drawing heavily on prior

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3. See *infra* notes 212-14 and accompanying text; see also Tietz & Price, *supra* note 1, at 339-40 n.117 (giving a qualitative hint on mechanisms for at least some acknowledgments).

4. See *infra* Parts III.B, F.

5. See *infra* Parts III.D, F. We only identified a few nonbinary law professors in our sample, too few to break out in any analyses. We have grouped them with women law professors rather than exclude them.

6. See *infra* Parts III.C, F.

7. See *infra* Part III.F.

8. See *infra* Figure 12.

9. See *infra* Part III.G.

10. See *infra* Part III.G. Whether boundary-crossing acknowledgments are a testament to interdisciplinary boundary-crossing feedback or to widespread interests of tech/IP scholars must await future, more fine-grained work.

11. See *infra* Part III.G.

12. A baker's Gaul, if you will.

work by two of us (NP and JT).<sup>13</sup> Part III gives our results. Part IV discusses those results and offers some concluding thoughts. An Appendix provides more details on our methods and descriptive statistics for those who are particularly interested.

## I. Background

### A. Hierarchy, Race, and Gender in Legal Academia

We are far from the first to describe the problematic effects of hierarchy, race, and gender in legal academia. There isn't space here, of course, to comprehensively survey that rich literature. And so we mention just some of it to give some context as to *why* we are looking at demographics-informed acknowledgment networks.

First: hierarchy. Legal academia is obnoxiously hierarchical.<sup>14</sup> Everything is ranked to death. Privilege begets privilege—it's certainly not controversial to surmise that a connection to a fancy name brokers influence.<sup>15</sup> Daniel Katz and colleagues took a network-oriented look (more on that later) at the legal academy, looking specifically at the influence of particular institutions.<sup>16</sup> The result? An “extremely skewed distribution of social authority.”<sup>17</sup> Certain schools place graduates in law-teaching positions at more prestigious schools (that is, in schools themselves more likely to have influence), and those graduates influence future graduates.<sup>18</sup> Katz et al., applying a computational model for information diffusion, further showed how the “structural position” of “historically elite institutions . . . allows such schools to become intellectual super-spreaders.”<sup>19</sup> That skew, they argue, matters to individuals, to

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13. Tietz & Price, *supra* note 1, at 321-23.

14. See Jewel, *supra* note 1, at 1173. Jewel suggests that this ranking tends to reflect social stratification and privilege among those with “cultural or economic capital.” *Id.*

15. Deo, *supra* note 1, at 953 (explaining that “when external actors identify an individual as affiliated with a group considered powerful within a given context, that individual receives the associated privileges”).

16. Daniel Martin Katz, Joshua R. Gubler, Jon Zelner, Michael J. Bommarito II, Eric Provins & Eitan Ingall, *Reproduction of Hierarchy? A Social Network Analysis of the American Law Professoriate*, 61 J. LEGAL EDUC. 76, 77-78 (2011).

17. *Id.* at 78. A distribution “even more than is present in other intellectual disciplines.” *Id.*

18. See, e.g., *id.* at 94-95 (analyzing degree distribution of American law professorate); see also Sarah Lawsky, *Lawsky Entry Level Hiring Report 2022*, PRAWFSBLAWG (Sept. 22, 2022), <https://perma.cc/WEM7-ZZHR> (showing data that about half of all reported entry-level law professor hires received their J.D. from eight schools, all in the top ten; a little over one in seven hires received their J.D. from Yale).

19. Katz et al., *supra* note 16, at 78-79, 96.

institutions, and to the development of the law.<sup>20</sup> In our view, Katz’s model also suggests that institutional prestige and network structure have a role in legal hierarchy and legal academic culture. Our own previous work supports this view, too—we found that some law review editors look to authorial institutional prestige in vetting articles.<sup>21</sup> Some authors, too, craft their acknowledgment footnotes with prestige in mind.<sup>22</sup> We also found that articles with more people thanked (perhaps signaling a larger academic circle) placed higher. On hierarchy, it also turns out that higher-ranking law reviews tend to publish their own faculty more, regardless of article quality.<sup>23</sup> Indeed, Minna Kotkin has observed that top journals “publish virtually no authors who do not teach at top 25 schools.”<sup>24</sup> Lucille Jewel argues that “the myth of merit mirrors and reinforces the way that our common law tradition uses themes of equality and objectivity to foster the idea that social outcomes are the fair result of neutral processes rather than the result of pre-existing inequalities.”<sup>25</sup> And if hierarchy affects other measures of success, it’s not a stretch to hypothesize that hierarchy would also affect the acceptance of legal scholarship.

And hierarchy stretches beyond institutional prestige: For example, certain authors are more famous than others, seniority within a department is hierarchical, tenure-track research professorships are viewed as more prestigious than legal writing or clinical positions,<sup>26</sup> large white-shoe law firms are viewed as more prestigious than smaller firms, and federal positions are often viewed with more acclaim than state ones.

Next, race. As Meera Deo has noted, only 7% of law professors are women of color, and 8% are men of color.<sup>27</sup> In addition to being a small minority at

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20. *Id.* at 77-78, 81, 96.

21. Tietz & Price, *supra* note 1, at 333-34.

22. *Id.* at 333 & n.87 (mentioning, for example, that one author noted: “I do consider the ‘fame’ of a colleague.”).

23. Albert H. Yoon, *Editorial Bias in Legal Academia*, 5 J. LEGAL ANALYSIS 309, 336 (2013). Interestingly, Yoon finds that scholars are less likely to publish their higher-impact (or higher-quality) work in their home law reviews. *Id.* at 330, 336.

24. Minna J. Kotkin, *Of Authorship and Audacity: An Empirical Study of Gender Disparity and Privilege in the “Top Ten” Law Reviews*, 31 WOMEN’S RTS. L. REP. 385, 389 (2010).

25. Jewel, *supra* note 1, at 1175.

26. *Id.* at 1222 n.337 (“[C]linical and skills teachers continue to occupy, in the academy, a lower class than doctrinal casebook method teachers.”); *see id.* at 1203 (observing that “schools that emphasize teaching and practical training do so at the expense of their prestige and rank”); Rachel López, *Unentitled: The Power of Designation in the Legal Academy*, 73 RUTGERS U. L. REV. 923, 923-25 (2021).

27. *See* Meera E. Deo, *Investigating Pandemic Effects on Legal Academia*, 89 FORDHAM L. REV. 2467, 2471 (2021) [hereinafter Deo, *Pandemic Effects*]; *see also* Meera E. Deo, *A Better Tenure Battle: Fighting Bias in Teaching Evaluations*, 31 COLUM. J. GENDER & L. 7, 12 tbl.1 (2015)  
*footnote continued on next page*

their law schools, these faculty are expected to do much above and beyond the work that gets them authorship credit and purchase with tenure-and-promotion committees. Deo has documented, for instance, the “extra service burdens many women of color carry both professionally and personally” compared with their white colleagues.<sup>28</sup> And faculty of color may face other obstacles to their scholarship, such as “alienation among their colleagues, hostility from students, and a lack of support for their research.”<sup>29</sup> As Deo remarks, “research and personal narratives have also documented how the presumption of incompetence works against women of color faculty.”<sup>30</sup> To the extent that the professorial social structure differs for faculty of color in a way

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(presenting statistics by gender and race). Percentages are based on data from 2008, the last year the Association of American Law Schools released law faculty data. *Id.*

28. See Deo, *Pandemic Effects*, *supra* note 27, at 2468-69, 2468 n.2 (citing DEO, *supra* note 2, at 6). For instance, women of color end up tasked with more student meetings and burdened with more committee tasks, and often wind up “placed on committees” by administrators “because of their identities, regardless of their preferences.” *Id.* at 2474, 2476 (citing Deo, *supra* note 1, at 980-84, 990-93). What’s more, mentoring students of color (amid the otherwise “predominantly white male faculties at most law schools”)—including, for instance, moot-court coaching—places a unique demand on their shoulders. Deo, *supra* note 1, at 992. Despite their time, effort, and importance, these contributions “are rarely formally recognized” for promotional, courseload, or bonus purposes. *Id.*
29. Deo, *Pandemic Effects*, *supra* note 27, at 2472 (quoting Meera E. Deo, *Looking Forward to Diversity in Legal Academia*, 29 BERKELEY J. GENDER, L. & JUST. 352, 369-70 (2014)); see also Deo, *supra* note 1, at 964 (describing survey data on collegiality between colleagues and noting that white faculty view their relationships with white colleagues more favorably than they view their relationships with faculty of color). For decades, such professors have reported strong resistance from students who, by virtue of their whiteness, often shoulder faculty of color with a presumption of incompetence. Bell and Delgado, for instance, report several striking examples, such as students often assuming a “black woman teaching at a major southern university” was “a maid,” and a first-year law student who, having “unfortunately” been assigned the professor he didn’t want, prepared a “memorandum reviewing the professor’s teaching.” Richard Delgado & Derrick Bell, *Minority Law Professors’ Lives: The Bell-Delgado Survey*, 24 HARV. C.R.-C.L. L. REV. 349, 357-63 (1989) (among other examples). Others reported “regular[] reject[ion]” of funding proposals, despite the merits of the underlying work, compared with majority-race colleagues. *Id.* at 363. To think that student hostility has since abated would take willful blindness. Contemporary student evaluations, for instance, show that the problem still persists. See, e.g., Roger W. Reinsch, Sonia M. Goltz & Amy B. Hietapelto, *Student Evaluations and the Problem of Implicit Bias*, 45 J. COLL. & U. L. 114, 124-25 (2020) (“Professors of color have published poignant accounts of harshly negative student evaluations.”).
30. Deo, *Pandemic Effects*, *supra* note 27, at 2472-73 (citing PRESUMED INCOMPETENT: THE INTERSECTIONS OF RACE AND CLASS FOR WOMEN IN ACADEMIA (Gabriella Gutiérrez y Muhs, Yolanda Flores Niemann, Carmen G. González & Angela P. Harris eds., 2012); and PRESUMED INCOMPETENT II: RACE, CLASS, POWER, AND RESISTANCE OF WOMEN IN ACADEMIA (Yolanda Flores Niemann, Gabriella Gutiérrez y Muhs & Carmen G. González eds., 2020)).



that affects scholarship, that matters: Perceptions of scholarly success affect tenure, a key career inflection point.<sup>31</sup> Robert Chang writes, “The voices of minority scholars will not be heard if we do not have the opportunity to write.”<sup>32</sup> In that sense, academic context and connections matter: A lack of citation and recognition “can limit the possibility for advancement and influence,” for instance if “leaders in our field do not cite us or engage our work.”<sup>33</sup> Others have also pointed to “the effect of racial difference on the distribution of scholarly influence and prestige in legal academia.”<sup>34</sup>

Third, gender. Deo has documented particular gender-based challenges in legal academia that shape the legal environment in which nonmale scholars work—including the prevalence of “silencing, mansplaining, and hepeating”<sup>35</sup> that characterize many of the interactions women faculty have with colleagues, the presumption of incompetence working against them in the classroom, and other forms of intersectional bias.<sup>36</sup> Other work is consistent with these findings: In our own previous work, we found that articles with a higher percentage of male acknowledgments were placed in more prestigious law reviews.<sup>37</sup> Kotkin has suggested that law review editorial boards seem to exhibit at least some unconscious bias with regard to gender in article selection.<sup>38</sup> And she posits that “gender disparity in law review authorship is a microcosm of women in law generally”—that is, despite some statistical progress in overall hiring and promotion rates, the top rung of the ladder remains comparatively elusive.<sup>39</sup> Kotkin’s work, examining statistics on publication in prestigious law reviews, probes several hypotheses about why

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31. See Deo, *Pandemic Effects*, *supra* note 27, at 2472 (noting that white men were the “most likely to find the tenure process easy” (quoting Katherine Barnes & Elizabeth Mertz, *Is It Fair? Law Professors’ Perceptions of Tenure*, 61 J. LEGAL EDUC. 511, 519 (2012))); Jewel, *supra* note 1, at 1202.

32. Robert S. Chang, *Richard Delgado and the Politics of Citation*, 11 BERKELEY J. AFR.-AM. L. & POL’Y 28, 33 (2009).

33. *Id.*

34. Randall L. Kennedy, *Racial Critiques of Legal Academia*, 102 HARV. L. REV. 1745, 1745-49 (1989) (discussing in particular the work of Derrick Bell, Richard Delgado, and Mari Matsuda).

35. “Hepeating” occurs “when a woman suggests an idea and it’s ignored, but then a guy says [the] same thing and everyone loves it.” Nicole Gugliucci (@NoisyAstronomer), TWITTER (Sept. 22, 2017, 6:01 AM), <https://perma.cc/9VMV-T4CP>.

36. Deo, *Pandemic Effects*, *supra* note 27, at 2475 (discussing DEO, *supra* note 2) (emphasis omitted); Deo, *supra* note 1, at 976-78 (cataloguing mansplaining).

37. Tietz & Price, *supra* note 1, at 332-33.

38. Kotkin, *supra* note 24, at 388. Kotkin caveats that her dataset was unable to examine the gender breakdown of the potential author pool. *Id.* at 387.

39. *Id.* at 392.

gender disparities seem to exist.<sup>40</sup> Women are comparatively “over-represented in non-tenure eligible legal writing and clinical positions.”<sup>41</sup> Like scholars of color, women also face a higher burden of non-credited work.<sup>42</sup> Deo has catalogued how the COVID-19 pandemic serves as a lens for the structural differences felt by women (and authors of color) in academia.<sup>43</sup> To that end, she describes the nascent “Pandemic Effects on Legal Academia” project, or PELA, which investigates “scholarly productivity rates by race, gender, and raceXgender from 2019 to 2022.”<sup>44</sup> And as the last point suggests, these effects are not independent. Significant work on intersectionality considers the interactions between race and gender, and how those factors are linked to hierarchy in the legal academy.<sup>45</sup>

The data suggest that many of those who benefit most from various forms of privilege (namely, white men) are frequently unaware of these problems, underappreciate them, or ignore them.<sup>46</sup> There are of course those who insist that there is no problem at all—that nonmale, nonwhite legal scholars have it

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40. *Id.* at 386.

41. *Id.* at 413; see also Jo Anne Durako, *Second-Class Citizens in the Pink Ghetto: Gender Bias in Legal Writing*, 50 J. LEGAL EDUC. 562, 562-63 (2000); Renee Nicole Allen, Alicia Jackson & DeShun Harris, *The ‘Pink Ghetto’ Pipeline: Challenges and Opportunities for Women in Legal Education*, 96 U. DET. MERCY L. REV. 525, 527 (2019).

42. E.g., Deo, *Pandemic Effects*, *supra* note 27, at 2477 (“Often, faculty who are men place these expectations squarely on the shoulders of their women colleagues.”); Deo, *supra* note 1, at 990-93 (cataloguing how women, especially women of color, tend to be overburdened by service).

43. Deo, *Pandemic Effects*, *supra* note 27, at 2469, 2485-86 (discussing drops in publication submissions by women during the first year of the COVID-19 pandemic).

44. *Id.* at 2468, 2470.

45. For earlier work on intersectionality in the legal academy, see, for example, Deborah J. Merritt & Barbara F. Reskin, *The Double Minority: Empirical Evidence of a Double Standard in Law School Hiring of Minority Women*, 65 S. CAL. L. REV. 2299, 2301 (1992); Cheryl I. Harris, *Law Professors of Color and the Academy: Of Poets and Kings*, 68 CHI-KENT L. REV. 331, 334 (1992); and Katherine L. Vaughns, *Women of Color in Law Teaching: Shared Identities, Different Experiences*, 53 J. LEGAL EDUC. 496, 496-97 (2003). A 2020 Rutgers University Law Review Symposium of essays responding to Deo’s *Unequal Profession* contains a wealth of current scholarship. See Elizabeth Kronk Warner, *Living in Two Worlds*, 73 RUTGERS U. L. REV. 933, 933 (2021); Renee Nicole Allen, *Our Collective Work, Our Collective Strength*, 73 RUTGERS U. L. REV. 881, 890-91 (2021); Priya Baskaran, *Service, Scholarship, and Radical Citation Practice*, 73 RUTGERS U. L. REV. 891, 892-93 (2021); Kimberly Mutcherson, *Taking Our Space: Women of Color and Antiracism in Legal Academia*, 73 RUTGERS U. L. REV. 869, 869-70 (2021); López, *supra* note 26, at 923-24; Meera E. Deo, *Unequal Profession, Unleashed*, 73 RUTGERS U. L. REV. 857, 857-58 (2021).

46. See Deo, *supra* note 1, at 965-67 (presenting survey results of how faculty perceptions differ by demographics).

just fine.<sup>47</sup> This is especially so amid moral panics against such things as critical race theory—or even against the very idea of acknowledging systemic biases.<sup>48</sup> Critics have pointed, for example, to statistics showing that, on a crude percentage basis, representation among legal academia has increased for historically underrepresented groups.<sup>49</sup> Others suggest that it is meritocracy that results in observed gender disparities.<sup>50</sup>

Such criticisms are often half-hearted and typically half-baked. Others before us have cast doubt on them.<sup>51</sup> And we should be clear: Of course the accounts and experiences of women and minorities in legal academia compellingly establish the problems of hierarchy, race, and gender.<sup>52</sup> We here

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47. See, e.g., if you must, Dan Subotnik, *Do Law Schools Mistreat Women Faculty? Or, Who's Afraid of Virginia Woolf?*, 44 AKRON L. REV. 867, 891 (2011) (fretting over “the innocent man searching for his own toe hold” among measures designed to improve equity). For a collection of works by the previous author along the same theme and an observation of Subotnik’s skepticism of “the ongoing relevance of race and sex discrimination,” see also Darren Lenard Hutchinson, *Who Locked Us Up? Examining the Social Meaning of Black Punitiveness*, 127 YALE L.J. 2388, 2412 & n.155 (2017) (reviewing JAMES FORMAN, JR., *LOCKING UP OUR OWN: CRIME AND PUNISHMENT IN BLACK AMERICA* (2017)).

48. Cf. Deo, *Pandemic Effects*, *supra* note 27, at 2489-90 (discussing “climate of fear” surrounding racial violence and hate crimes in recent years).

49. E.g., Subotnik, *supra* note 47, at 890-91.

50. Minna Kotkin documents (but, lest there be any confusion here, does not endorse) what she deems the “Larry Summers hypothesis” that some may harbor and that might influence implicit bias: Namely, that women are less adept at legal scholarship. See Kotkin, *supra* note 24, at 435. Or what Kotkin dubs the “slacker hypothesis”—that women are just writing less because they have other things to do. *Id.* at 431-33.

51. See, e.g., Professor Deo’s thorough work, cited throughout.

52. Many, including women and scholars of color, have built up this space over many years. We provide here only a few pointers for the interested reader. On race, see, for example, DERRICK BELL, *CONFRONTING AUTHORITY: REFLECTIONS OF AN ARDENT PROTESTER* (1994); Andrew Wm. Haines, *Reflections on Minority Law Professors Balancing Their Duties and Their Personal Commitments to Community Service and Academic Duties*, 10 ST. LOUIS U. PUB. L. REV. 305 (1991); Taleed El-Sabawi & Madison Fields, *The Discounted Labor of BIPOC Students & Faculty*, 12 CALIF. L. REV. ONLINE 17 (2021); Victor Essien, *Visible and Invisible Barriers to the Incorporation of Faculty of Color in Predominantly White Law Schools*, 34 J. BLACK STUD. 63 (2003); Matthew L.M. Fletcher, *On Becoming an American Indian Law Professor: 2021 Update* (Sept. 24, 2021) (unpublished manuscript), <https://perma.cc/QXK2-KEJT>; Roy L. Brooks, *Life After Tenure: Can Minority Law Professors Avoid the Clyde Ferguson Syndrome?*, 20 U.S.F. L. REV. 419 (1986); and Pamela J. Smith, *The Tyrannies of Silence of the Untenured Professors of Color*, 33 U.C. DAVIS L. REV. 1105 (2000).

On gender, see, for example, Christine Haight Farley, *Confronting Expectations: Women in the Legal Academy*, 8 YALE J.L. & FEMINISM 333 (1996); Deborah Jones Merritt & Barbara F. Reskin, *New Directions for Women in the Legal Academy*, 53 J. LEGAL EDUC. 489 (2003); Allen, *supra* note 45; Durako, *supra* note 41; Christopher J. Ryan, Jr. & Meghan Dawe, *Mind the Gap: Gender Pay Disparities in the Legal Academy*, 34 GEO. J. LEGAL ETHICS 567 (2021); Jane Murphy & Solangel Maldonado, *Reproducing Gender and Race Inequality in the Blawgosphere*, 41 HARV. J.L. & GENDER 239 (2018); Jennifer C. Mullins & Nancy

*footnote continued on next page*

simply seek to complement the conversation with some new data. We do not mean to suggest that quantitative analysis is *necessary* to counteract claims of unbiased meritocracies (or other like delusions). But this background made us curious about the social structure of legal academia. In particular, we were curious about how to visualize the structure of legal academia in a way that accounted for the connections that go unnoticed when focusing purely on citation and research output.

## B. Biographical Footnotes in Legal Academia

As has been convincingly and authoritatively observed by multiple people within the field, “U.S. legal scholarship is weird.”<sup>53</sup> It’s weird for a number of structural reasons: It often lacks peer review, for instance. It’s also weird for a number of reasons related to form. Most obviously, papers are unusually long and footnotes are plenty—to the surprise of many outside U.S. legal academia and to the chagrin of many within it.<sup>54</sup> Another unusual feature of the canonical law review article is the biographical footnote.<sup>55</sup>

It’s not that other fields don’t include biographical details of their authors generally, or that they don’t include acknowledgments. Many do.<sup>56</sup> But few disciplines give the biographical footnote its own little front-and-center role—a sort of opener to the paper’s main act.<sup>57</sup> There are exceptions, of

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Leong, *The Persistent Gender Disparity in Student Note Publication*, 23 YALE J.L. & FEMINISM 385 (2011); and Lorenzo Ductor, Sanjeev Goyal & Anja Prummer, *Gender and Collaboration*, REV. ECON. & STAT. (forthcoming), <https://perma.cc/S8JY-GVBT>. Cf. Christopher A. Cotropia & Lee Petherbridge, *Gender Disparity in Law Review Citation Rates*, 59 WM. & MARY L. REV. 771 (2018).

On hierarchy, see, for example, Stephen Thomson, *Letterhead Bias and the Demographics of Elite Journal Publications*, 33 HARV. J.L. & TECH. 203 (2019); Michael J. Higdon, *Beyond the Metatheoretical: Implicit Bias in Law Review Article Selection*, 51 WAKE FOREST L. REV. 339 (2016); and Katz et al., *supra* note 16.

53. Tietz & Price, *supra* note 1, at 309 & n.1.

54. See *id.* at 309; Lori McPherson, *Law Review Articles Have Too Many Footnotes*, 68 J. LEGAL EDUC. 457, 458 n.1 (2019) (remarking that the record is held by the 4,824 footnotes of Arnold S. Jacobs, *An Analysis of Section 16 of the Securities Exchange Act of 1934*, 32 N.Y.L. SCH. L. REV. 209 (1987)).

55. For a description of these footnotes and how they have changed over time, see Charles A. Sullivan, *Aside, The Under-Theorized Asterisk Footnote*, 93 GEO. L.J. 1093, 1095 (2005).

56. See Tietz & Price, *supra* note 1, at 319.

57. For instance, in *Science*, a leading interdisciplinary journal, brief acknowledgments appear at the very end of an article. See, e.g., Michael E. Mann, Byron A. Steinman, Daniel J. Brouillette & Sonya K. Miller, *Multidecadal Climate Oscillations During the Past Millennium Driven by Volcanic Forcing*, 371 SCI. 1014, 1019 (2021). *Nature*, another leading interdisciplinary journal, banishes acknowledgements from its print pages entirely. See, e.g., Colin J. Carlson et al., *Climate Change Increases Cross-Species Viral Transmission Risk*, 607 NATURE 555, 561 (2022) (noting that acknowledgements are available online).

course.<sup>58</sup> For instance, sometimes the biographical footnote is stark and minimalistic,<sup>59</sup> or omitted entirely.<sup>60</sup> But usually the biographical footnote is right there on a paper's initial page, bearing multiple lines and names in addition to the bare essentials of an author's institutional affiliation.<sup>61</sup> It can be long—a full paragraph.<sup>62</sup> It can include a bevy of names: of people, of institutions.<sup>63</sup> It can explain the role of various non-authors in the article

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58. Consider, for instance, unsigned Harvard student notes.

59. See, e.g., Zanita E. Fenton, *Sleight of Hand or the Old Bait & Switch?: Article III and the Politics of Self-Policing by the Court in Parents Involved*, 63 U. MIA. L. REV. 561, 561 n.1 (2009).

60. See, e.g., Lisa J. Bernt, *Suppressing the Mischief: New Work, Old Problems*, 6 NE. U. L.J. 311, 311 (2014).

61. See e.g., *supra* note \*.

62. See, e.g., Katie R. Eyer, *Protected Class Rational Basis Review*, 95 N.C. L. REV. 975, 975 n.\*\* (2017).

63. See, e.g., Monica C. Bell, *Police Reform and the Dismantling of Legal Estrangement*, 126 YALE L.J. 2054, 2055 (2017). The relevant text provides a wealth of information: the author's affiliation and funding; the identity of her research team and collaborating organizations; the names of those who gave feedback and suggestions (or support otherwise); where the paper was discussed; the editors; and the community:

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*Id.*

production process.<sup>64</sup> It can include jokes or asides.<sup>65</sup> The biographical footnote, indeed, can occupy most of a page in its own right<sup>66</sup> and might include some discursive text of its own.<sup>67</sup>

In a sense, a biographical footnote is a little snapshot of an author's professional and social network. It can also reflect the academic context of a paper in a way that its content or citations alone might not. For instance, it can identify the community of scholars that helped develop the piece (directly or indirectly). Are they from diverse fields, mostly generalists, or mostly specialists? Are they Ivy League only? Granted, looking only at footnotes still has limitations: For instance, network pictures might be incomplete due to frequent failures to credit members of certain groups for their contributions.<sup>68</sup>

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64. See, e.g., *id.*

65. See, e.g., Sanford Levinson, *If We Have an Imperfect Constitution, Should We Settle for Remarkably Timid Reform?*, 105 NW. U. L. REV. COLLOQUY 271, 271 n.\* (2011) ("This is a version of remarks initially presented at a panel on 'Tea Party Constitutionalism' organized by Professor Richard Albert for the 2011 meetings of the AALS in San Francisco. It was an excellent panel, and I regret only that it was held at the Hilton Hotel."). But cf. Brian J. Levy, 20 U.S.C. § 1406(b), 62 BUFF. L. REV. 377, 377 n.† (2014) ("Thanks to . . . Elissa, who is expecting a joke here but gets special thanks instead.").

66. The longest we identified listed scores of names—but interestingly, all of them were personal thanks, not those of scholars. See Tietz & Price, *supra* note 1, at 330 n.66 (citing William Lynch Schaller, *Scottie Pippen's Airball: On the Role of Fiduciary Duty Law in Illinois Professional Liability Cases*, 48 J. MARSHALL L. REV. 777, 777 n.\* (2015)).

67. For a biographical footnote occupying more than a page, and including a handful of distinct discursive paragraphs and a block quote, see Jonathan K. Van Patten, *The Trial and Incarceration of Andy Dufresne*, 62 S.D. L. REV. 49, 49 n.† (2017) (designating the article to the memory of a friend).

68. See, e.g., Jana Bacevic, *Epistemic Injustice and Epistemic Positioning: Towards an Intersectional Political Economy*, CURRENT SOCIO. ONLINEFIRST, Nov. 21, 2021, at 1, 8-10 (discussing "non-attribution," a phenomenon in academia involving "invoking a knowledge claim while omitting to credit its author"). To the extent that systemic biases affect crediting decisions (even implicitly), "deciding to omit someone's work distributes value (or academic capital) in ways that reflect and reproduce inequalities of gender, race, seniority and security." *Id.* at 9. And as Bacevic observes, attribution "has direct consequences for employment and promotion"—that is, "who gets cited and credited has consequences." *Id.* at 9.

It's also possible that a biographical-footnote-based picture of an author's social network might be plagued by another phenomenon that Bacevic identifies: *appropriation*. See *id.* at 10-11 (discussing this phenomenon). That is, footnotes might incorrectly or disproportionately attribute helpful comments and review to some colleagues (for example, a senior scholar in the field who provided a few comments at a conference) instead of others (for example, a junior and unrecognized scholar from another department who *actually* made the comments that helped crystallize an article's main point). Or an article might acknowledge someone who barely saw a draft (diluting the role of other, genuinely acknowledged folks in the knowledge co-production stew).

But they certainly paint a richer and fuller picture than citations alone.<sup>69</sup> Two of us (NP & JT—for the rest of this subpart of the paper, “we”) found this all intriguing and previously looked both at the content of biographical footnotes and what authors and editors tended to do with them.<sup>70</sup> As a matter of background, we’ll recount a little bit of it here.

In that effort, we downloaded nearly 30,000 articles published over the span of a decade in generalist, student-edited, U.S. law reviews.<sup>71</sup> We focused on the most common form of scholarship in those journals: things denoted as “articles” (i.e., we filtered out, where possible, student notes, online pieces, essays, comments, book reviews, introductions, and the like).<sup>72</sup> We then extracted the text of the biographical footnote from each.<sup>73</sup>

The point of all this text harvesting was to get a somewhat numbers-based sense of what acknowledgments footnotes look like. How long are they? How many people tend to get thanked in each? Do men get thanked more than women? Do fancier-placed articles acknowledge more people? Do certain keywords pop up more often in articles in higher-ranked journals?

To that end, we used some rudimentary natural language processing to automatically parse and tag all that text.<sup>74</sup> We found that acknowledgment footnotes tend to be longer for higher-ranked journals—about twice as long for the top-ten-ranked than for the median.<sup>75</sup> This neatly paralleled an increase in the number of people thanked in each.<sup>76</sup> The top handful of journals averaged about fifteen people in the biographical footnote—the median journal about three or four.<sup>77</sup> The higher-placed articles were more likely to feature certain words reflecting the scholarly communities and opportunities of those authors (e.g., “workshop,” “conference,” and “roundtable”).<sup>78</sup> The disparities were sharper for some terms than others—“workshop” increased dramatically in the top journals, “research” and “feedback” increased gradually, and things like

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69. Citations only reflect links to particular sentences and propositions that survive into the final draft of the paper. They are limited to previously published accounts, and even then only to noting the *authors* of those accounts (ignoring colleagues, research assistants, and the like). Acknowledgments aren’t limited to a published corpus, aren’t limited to particular sentences, and aren’t limited to authors.

70. Tietz & Price, *supra* note 1, at 310-12.

71. *Id.* at 310-11. Specifically, we studied articles published in 183 law reviews from 2008 to 2017. *Id.* at 321 & n.4.

72. *Id.* at 321.

73. *Id.*

74. *Id.* at 322.

75. *Id.* at 323.

76. *Id.* at 324.

77. *Id.*

78. *Id.* at 324-25.

“support” or “students” or “editors” were relatively flat.<sup>79</sup> On top of that, thanks generally went heavily to men.<sup>80</sup> There is more, but suffice it to say that our results suggested that there is something different about top-placed papers (and their authors).

We wanted a broader picture, too. So we sent a survey out by email and social media, asking authors and editors about their experiences.<sup>81</sup> That is, we asked authors about demographics, seniority, footnote-writing process and standards (e.g., when one would thank a colleague), expectation for others’ footnotes (e.g., when one might expect a thanks from a colleague), and whether footnotes were written with editors in mind.<sup>82</sup> We asked editors about their article selection process, perceived usefulness of footnotes, and information about their journal.<sup>83</sup> It was an informal look, and one of convenience.<sup>84</sup> But it gave us some interesting insights both into knowledge co-production and de facto peer review.

As to knowledge co-production, we found that most articles acknowledged multiple people, usually for playing some productive role in the article-creation process (even if at some level of attenuation).<sup>85</sup> Editors understood this function of footnotes—signaling co-production—as they tended to understand that including a name signified a connection, however attenuated, to the piece.<sup>86</sup> Some authors reported using their biographical footnotes to signal their scholarly network (and even considered this when deciding whom to ask for feedback on papers).<sup>87</sup> Others sought to signal credibility—both as to fanciness and to authority for interdisciplinary articles.<sup>88</sup> Other indicia of co-production were common, too: noting the help of research assistants, participation in conferences, and the like.<sup>89</sup>

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79. *Id.* at 324-28; *see also id.* at 329-30.

80. *Id.* at 332. Of course, that more acknowledgments in footnotes went to men doesn’t mean that men were more frequent participants in knowledge co-production. Given our survey results in that paper and the background phenomenon of “epistemic injustice,” *see* Bacevic, *supra* note 68, at 4, it’s more likely that men simply get thanked more because of the academic prestige-signaling function of doing so (given the male skew of higher-ranked academic authorship).

81. Tietz & Price, *supra* note 1, at 323.

82. *See id.* at 350.

83. *See id.*

84. *Id.* at 323.

85. *Id.* at 324, 330.

86. *E.g., id.* at 330.

87. *E.g., id.* at 333.

88. *Id.* at 334.

89. *Id.* at 331.



As to peer review, we found that some editors indeed pay attention to who's thanked—as a proxy for vetting or as a heuristic to filter out the flood of submitted articles.<sup>90</sup> For instance, a lack of acknowledged commenters could be a red flag.<sup>91</sup> Noting a conference or workshop might signify that a paper had been at least somewhat refined by peers.<sup>92</sup> Some editors and authors were conscious of the potential gamesmanship involved.<sup>93</sup> To others, it hadn't occurred.<sup>94</sup>

In all, this first look supported some hunches we had—that knowledge co-production is more common in legal scholarship than the lone-author tradition would suggest, and that there are functional substitutes for peer review in operation.<sup>95</sup> And our results could reflect at least two potential mechanisms: one, a “quality improvement” mechanism by which the input of various scholars into an article *actually* makes it better (and place higher because editors can ascertain article quality); two, a “proxy” mechanism, by which articles place better because editors use the association between numerous scholars and an article to *symbolize* vetting and estimate that the article is better than it would be otherwise.<sup>96</sup> Under either mechanism, an author's social network matters.

### C. Social Network Analysis and Academia

#### 1. Social network analysis in general

To that end, the question of methodology led us to social network analysis. As just described, two of us (NP & JT—from here on no longer deemed “we”) had previously plumbed acknowledgment footnotes in legal academia.<sup>97</sup> That work was statistical, peering into the prevalence of certain properties or phrases among highly-ranked law review articles.<sup>98</sup> Some familiarity with

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90. *E.g., id.* at 335-36, 343.

91. *Id.* at 336.

92. *Id.* at 337.

93. *E.g., id.* at 335, 339.

94. *Id.* at 335, 338 & n.113.

95. *See id.* at 330-40.

96. *See id.* at 340-41.

97. *Id.* at 310-11; *see also* Brian L. Frye, *Nicholson Price and Jonathan Tietz on Vanity Footnotes*, IPSE DIXIT, at 10:25-11:15 (Apr. 15, 2020), <https://perma.cc/5HZE-7FG2> (to locate, click “View the Live Page”).

98. *See* Tietz & Price, *supra* note 1, at 323-35.

network analysis among the three of us<sup>99</sup> led to our interest in expanding the dataset to inquire into the network properties of acknowledgments: What is the map, so to speak, of who's thanking whom?

First, some context: What is social network analysis? In short, a social network is a set of people (or groups of people) with links to each other—a collection of individuals, each of whom know each other in a certain way.<sup>100</sup> A particular “node” (here, a legal scholar) might have a connection with any number of other nodes in the network—connections referred to as “edges.”<sup>101</sup> In any given network, the presence of an edge (again, that's just a connection) between any two nodes means that the two share some specific kind of tie, such as coauthoring a paper, being on the same faculty, being friends, citing to each other, or the like.<sup>102</sup> The key point is that such a network gives you a view of how the particular interactions or relationships in a large group are structured. For instance: Does everyone know each other, or are there cliques?<sup>103</sup> Are some people more connected than others? Do certain positions within a network correlate to greater acclaim?<sup>104</sup> Division of a network into subnetworks (e.g., subnetworks by gender, area of scholarship, institution size, race) allows comparison of whether different communities exhibit different social structures and examination of how those differences affect the nodes in those communities.<sup>105</sup> And comparison of networks over time allows longitudinal insight into how a social structure evolves.<sup>106</sup>

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99. See, e.g., Jonathan I. Tietz, Christopher J. Schwalen, Parth S. Patel, Tucker Maxson, Patricia M. Blair, Hua-Chia Tai, Uzma I. Zakai & Douglas A. Mitchell, *A New Genome-Mining Tool Redefines the Lasso Peptide Biosynthetic Landscape*, 13 NATURE CHEM. BIOLOGY 470, 471 (2017) (using network analysis to map molecules made by microbes).

100. E.g., M. E. J. Newman, *The Structure of Scientific Collaboration Networks*, 98 PNAS 404, 404 (2001); Shahadat Uddin, Liaquat Hossain, Alireza Abbasi & Kim Rasmussen, *Trend and Efficiency Analysis of Co-authorship Network*, 90 SCIENTOMETRICS 687, 688 (2012); Paul H. Edelman & Tracey E. George, *Six Degrees of Cass Sunstein: Collaboration Networks in Legal Scholarship*, 11 GREEN BAG 2D 19, 22-24 (2007); Ryan Whalen, *Legal Networks: The Promises and Challenges of Legal Network Analysis*, 2016 MICH. ST. L. REV. 539, 540-52.

101. See, e.g., Katz et al., *supra* note 16, at 81.

102. *Id.*

103. See, e.g., Andrew Hayashi, *The Evolving Network of Legal Scholars* 19 (Univ. of Va. Sch. of L. Pub. L. & Legal Theory Rsch. Paper, Paper No. 2021-25, 2022), <https://perma.cc/L6VR-PNFZ> (to locate, select “View the live page,” and then select “Download This Paper”).

104. See, e.g., Alireza Abbasi, Kon Shing Kenneth Chung & Liaquat Hossain, *Egocentric Analysis of Co-authorship Network Structure, Position and Performance*, 48 INFO. PROCESSING & MGMT. 671, 674 (2012).

105. See, e.g., Newman, *supra* note 100, at 405-06 (comparing areas of scholarship).

106. See, e.g., Hayashi, *supra* note 103, at 28 (comparing legal scholar coauthorship subnetworks by decade); Abbasi et al., *supra* note 104, at 675-77; Alireza Abbasi, Liaquat Hossain & Loet Leydesdorff, *Betweenness Centrality as a Driver of Preferential Attachment in the Evolution of Research Collaboration Networks*, 6 J. INFORMETRICS 403, 407 (2012)

*footnote continued on next page*

By supplementing a network with properties of the individual nodes (say, research productivity, citation counts, perceived prestige, etc.), one can also start to probe the implications of a particular social structure.<sup>107</sup> For instance: Are more connected people also more frequently cited?<sup>108</sup> Do certain people control entry into or success within a community?<sup>109</sup>

## 2. Insights from non-legal academia

Just as the invention of hammers doubtless heralded quick innovation in nails, the advent of easily computerized network-analysis methods spurred quick deployment in a number of fields.<sup>110</sup> This predictably (if navel-gazingly<sup>111</sup>) included the study of, well, studies. And so, a recent interdisciplinary body of literature addresses social network analysis in the context of academia.<sup>112</sup>

A few key insights from this literature bear mention. First, it seems that research productivity, citations, and network placement are connected.<sup>113</sup> Scholars with more coauthors and more network centrality tend to be cited more.<sup>114</sup> Network location also affects the access of a scholar to new entrants

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(examining network structure with respect to new entrants into a collaboration network compared with a previous year); Uddin et al., *supra* note 100, at 689 (conducting twenty-year longitudinal network study of coauthorship network).

107. See, e.g., Hayashi, *supra* note 103, at 41-42 (annotating author nodes with race, gender, and sexual orientation demographic data).

108. Abbasi et al., *supra* note 104, at 677.

109. See, e.g., Abbasi et al., *supra* note 106, at 407 (describing certain central nodes as “broker[s] or gatekeeper[s]”).

110. See Edelman & George, *supra* note 100, at 23 (noting application of network-analysis methods in applied mathematics, physics, and computer science); Whalen, *supra* note 100, at 546.

111. See Edelman & George, *supra* note 100, at 23 (acknowledging “the inherent interest of academics in studies of their own behavior”) (citations omitted).

112. E.g., Abbasi et al., *supra* note 106, at 403-04 (reviewing literature); Uddin et al., *supra* note 100, at 688-89; M. E. J. Newman, *Coauthorship Networks and Patterns of Scientific Collaboration*, 101 PNAS 5200, 5200 (2004); Newman, *supra* note 100, at 404; Xiaoming Liu, Johan Bollen, Michael L. Nelson & Herbert Van de Sompel, *Co-authorship Networks in the Digital Library Research Community*, 41 INFO. PROCESSING & MGMT. 1462, 1463-64 (2005); Francisco José Acedo, Carmen Barroso, Cristóbal Casanueva & José Luis Galán, *Co-authorship in Management and Organizational Studies: An Empirical and Network Analysis*, 43 J. MGMT. STUD. 957, 958 (2006); A.L. Barabási, H. Jeong, Z. Néda, E. Ravasz, A. Schubert & T. Vicsek, *Evolution of the Social Network of Scientific Collaborations*, 311 PHYSICA A 590, 591 (2002); James Moody, *The Structure of a Social Science Collaboration Network: Disciplinary Cohesion from 1963 to 1999*, 69 AM. SOCIO. REV. 213, 214 (2004).

113. E.g., Abbasi et al., *supra* note 106, at 406-07 (analyzing, for instance, the link between publication count, author count, and network centrality).

114. Abbasi et al., *supra* note 104, at 677; see also Alireza Abbasi, Jörn Altmann & Liaquat Hossain, *Identifying the Effects of Co-authorship Networks on the Performance of Scholars: A*  
*footnote continued on next page*

and new collaborators: In the physical sciences, for instance, new entrants tend to connect with the already well connected.<sup>115</sup> It's not just about the *number* of connections, though—being connected to a more dispersed set of people seems important, and *location* in a network matters (by analogy, if Person A has twenty good friends, all teenagers in Peoria, Illinois, and Person B has only three good friends but they happen to be a Supreme Court justice, a university president, and a senator, person B's network is likely more influential on the whole).<sup>116</sup> It also seems that certain scholars can function as gatekeepers (or “brokers”), effectively facilitating access to other scholars.<sup>117</sup> And the effects of network position can be different for newer scholars than for those who are more established.<sup>118</sup> True, these insights are derived largely from the physical sciences. But they form an important backdrop to frame the interrogation of legal academia—which we have previously noted is not actually so dissimilar in practice from the physical sciences as one might surmise.<sup>119</sup>

### 3. Networks and legal scholarship

Although network analysis in legal scholarship is naturally a creature of advances in computational methodology, it owes a great foundational debt to early empirical structural work by Richard Delgado. About four decades ago, Delgado carefully documented citation practices in legal academia among leading civil-rights scholars.<sup>120</sup> Despite more apparent parity outside the realm of civil-rights scholarship, he found that “the giants in the [civil rights] field[] only infrequently cite a minority scholar,” a “failure to acknowledge” that

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*Correlation and Regression Analysis of Performance Measures and Social Network Analysis Measures*, 5 J. INFORMETRICS 594, 605 (2011).

115. See Abbasi et al., *supra* note 106, at 411 (examining “betweenness centrality” as a “predictor of preferential attachment by new entrants”). As Abbasi and coauthors explain, “the rich get richer.” *Id.* at 405.
116. Abbasi et al., *supra* note 104, at 672-78. Abbasi et al. explain this phenomenon through the lens of “structural holes theory” and posit that having many contacts is not particularly helpful if they're largely redundant. *Id.*
117. *E.g.*, Abbasi et al., *supra* note 104, at 673-74 (reviewing “structural holes theory”); Abbasi et al., *supra* note 106, at 407.
118. See, *e.g.*, Vanash M. Patel, Pietro Panzarasa, Hutan Ashrafian, Tim S. Evans, Ali Kirresh, Nick Sevdalis, Ara Darzi & Thanos Athanasiou, *Collaborative Patterns, Authorship Practices and Scientific Success in Biomedical Research: A Network Analysis*, 112 J. ROYAL SOC'Y MED. 245, 253 (2019) (“Unlike other academics in junior positions, researchers in senior academic roles acting as coordinators of many collaborative groups could therefore gain a competitive advantage by enhancing social cohesion and facilitating third-party relationships among collaborators from different groups.”).
119. Tietz & Price, *supra* note 1, at 315-16.
120. Richard Delgado, *The Imperial Scholar: Reflections on a Review of Civil Rights Literature*, 132 U. PA. L. REV. 561, 561-63 (1984).

extended “even to nonlegal propositions and assertions of fact.”<sup>121</sup> Instead, the “mainstream writers tend[ed] to acknowledge only each other’s work” in a way that “resist[ed] entry by minority scholars into the field.”<sup>122</sup> The results of his findings (i.e., that “an inner circle of twenty-six scholars, all male and white, occupied the central arenas of civil rights scholarship to the exclusion of contributions of minority scholars”) spurred a flurry of responses from supporters and detractors;<sup>123</sup> indeed, the original article has been cited over a thousand times,<sup>124</sup> and others have taken a similar tack in other areas, such as feminist legal scholarship.<sup>125</sup> Delgado revisited and built on that work about a decade later, noting that “the situation is not greatly different.”<sup>126</sup> In so doing, he catalogued a variety of mechanisms by which many “inner-circle scholars” tend to either “continue to ignore the new voices of color and the feminists” or employ “limited, grudging, or calculated acceptance, coupled with resort to an arsenal of mechanisms to reduce its impact.”<sup>127</sup> Later, Delgado also examined the citation practices of so-called “outsider scholars” (i.e., “crits, feminists, and critical race theorists”), asking whether they were guilty of the same in-group preferences.<sup>128</sup> (No, it turns out.)<sup>129</sup> That work provided a pointed rebuttal to criticisms that these groups were just as guilty of the self-promotion that white

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121. *Id.* at 563.

122. *Id.* at 566.

123. See Richard Delgado, *The Imperial Scholar Revisited: How to Marginalize Outsider Writing, Ten Years Later*, 140 U. PA. L. REV. 1349, 1349 (1992) (remarking that *Imperial Scholar* had been cited “as often without approval as with”).

124. Search for articles citing *The Imperial Scholar*, GOOGLE SCHOLAR, <https://perma.cc/Q7VX-ZD5G> (archived Nov. 3, 2022) (identifying 1,006 citing references).

125. E.g., Patricia A. Cain, *Feminist Legal Scholarship*, 77 IOWA L. REV. 19, 19 n.3 (1991).

126. Delgado, *supra* note 123, at 1372.

127. *Id.* at 1355, 1358. For example, a paper might discuss white scholars’ papers in depth but cite minorities’ papers only as an afterthought, for instance “at the end of a string citation.” *Id.* at 1358. Or a paper might cite minority-authored work only where conspicuously topical to that author’s minority status. *Id.* at 1359. Others would “either ignore the insurgent scholars or treat their work diffidently,” for instance relegating all “works by women and minority authors [to] a single footnote.” *Id.* at 1362. Another commonly observed practice was to discuss white-authored papers in detail but to cite only “an early page” of minority-authored works, raising the inference that the article in question wasn’t *really* read or considered. *Id.* at 1363. Or, a paper might cite just a single work by a minority author, ignoring their richer applicable body of work. *Id.* at 1367-68.

128. Richard Delgado, *The Colonial Scholar: Do Outsider Authors Replicate the Citation Practices of the Insiders, but in Reverse?*, 71 CHI.-KENT L. REV. 969, 969 (1996).

129. *Id.* at 974.

male scholars had been.<sup>130</sup> In all, Delgado's work "drew much-needed attention to the sociology of citation practices in legal scholarship."<sup>131</sup>

Delgado's work is remarkable not only in its social significance<sup>132</sup> and empirical innovation<sup>133</sup> but in its *structural* recognition of the signaling function of various aspects of legal writing and publishing that others often write off as technical minutiae. (For that, we—delving as we are into such minutiae, or what we might call meta-scholarship—are grateful.) For instance, in looking at whether authors treated certain groups' work dismissively, Delgado examined the use of particular citation signals: "cf.," "see also," "see," "see generally," and the like.<sup>134</sup> In understanding how seriously an author's work was considered, Delgado looked at whether anything beyond the early pages were cited,<sup>135</sup> and whether the work reluctantly appeared at the end of a long string cite.<sup>136</sup> And in examining whether an author considered minority and nonmale voices to be a serious part of the conversation, he looked at whether those citations were (like citations to white, male authors) distributed through a paper or confined to a single, consolidated special-interest footnote.<sup>137</sup> The point is that citations are not just epistemic bookkeeping but also signals of academic context.

To the extent *network* analysis has been used in law, it has mostly been in the context of legal documents or provisions—for instance, citation networks of patents,<sup>138</sup> case law,<sup>139</sup> and codes, statutes, and regulations.<sup>140</sup> Some have

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130. *Id.* at 974-75 ("Vengeful or blatantly exclusionary citation of the sort . . . simply seemed not to occur."); *cf. id.* at 969 (noting Arthur Austin's view of "rampant" "in-group and self-citation").

131. Chang, *supra* note 32, at 34.

132. Before then, "extremely little was known about the norms and behavior surrounding citation practices in law." *Id.* at 34.

133. *See, e.g.,* Delgado, *supra* note 128, at 970, 974 (explaining methodology).

134. *Id.* at 974-75; Delgado, *supra* note 123, at 1357-58.

135. Delgado, *supra* note 123, at 1363.

136. *Id.* at 1358.

137. *Id.* at 1362.

138. Jure Leskovec, *Patent Citation Network*, STAN. NETWORK ANALYSIS PROJECT, <https://perma.cc/AAV3-RHLP> (archived Oct. 16, 2022); Whalen, *supra* note 100, at 550 (reviewing examples).

139. *E.g.,* Thomas A. Smith, *The Web of Law*, 44 SAN DIEGO L. REV. 309, 309-13 (2007) (conducting a network analysis of four million judicial opinions); Joseph S. Miller, *Law's Semantic Self-Portrait: Discerning Doctrine with Co-Citation Networks and Keywords*, 81 U. PITT. L. REV. 1, 5-7 (2019) (analyzing a network of Supreme Court cases); Whalen, *supra* note 100, at 548-50 (reviewing examples).

140. *E.g.,* Michael J. Bommarito II & Daniel M. Katz, *A Mathematical Approach to the Study of the United States Code*, 389 PHYSICA A 4195, 4195-96 (2010); Whalen, *supra* note 100, at 551-52.

looked at scholarship, but their lens has been work-centric rather than author-centric—as with Oren Perez, Judit Bar-Ilan, Reuven Cohen, and Nir Schreiber’s look into the network of citations between papers.<sup>141</sup> On the social front, Daniel Katz, Joshua Gubler, Jon Zelner, Michael Bommarito II, Eric Provins, and Eitan Ingall have examined the social network of the American law professoriate, using as connections the institutions at which particular professors teach and received their degrees.<sup>142</sup> So has Andrew Hayashi, who used coauthorship between individual authors as connections (more on that later).<sup>143</sup> John Heinz and Edward Laumann examined the social structure of the Chicago-area bar.<sup>144</sup> And Daniel Katz and Derek Stafford have looked at the social network of the American federal judiciary on the basis of shared clerks.<sup>145</sup>

Most social network analysis of scholarship focuses on coauthorship. Why? A superficial explanation: It’s the easiest connection to measure.<sup>146</sup> Another explanation is that, outside of law, coauthorship is exceptionally common and reflects patterns of knowledge co-production (at least, reflects it *enough*).<sup>147</sup> Authorship credit in the sciences, for instance, tends to be

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141. Oren Perez, Judit Bar-Ilan, Reuven Cohen & Nir Schreiber, *The Network of Law Reviews: Citation Cartels, Scientific Communities, and Journal Rankings*, 82 MOD. L. REV. 240, 252-53 (2019).

142. Katz et al., *supra* note 16, at 77, 82.

143. Hayashi, *supra* note 103, at 15.

144. JOHN P. HEINZ & EDWARD O. LAUMANN, CHICAGO LAWYERS: THE SOCIAL STRUCTURE OF THE BAR, at xv (1982).

145. Daniel M. Katz & Derek K. Stafford, *Hustle and Flow: A Social Network Analysis of the American Federal Judiciary*, 71 OHIO ST. L.J. 457, 461 (2010).

146. Abbasi et al., *Betweenness Centrality*, *supra* note 106, at 403 (“In academia, co-authorship is the most visible and accessible indicator of scientific collaboration and ‘has thus been frequently used to measure collaborative activity,’ especially in bibliometric and network-analysis studies.”) (citations omitted) (quoting Staša Milojević, *Modes of Collaboration in Modern Science: Beyond Power Laws and Preferential Attachment*, 61 J. AM. SOC’Y FOR INFO. SCI. & TECH. 1410, 1410 (2010)); Acedo et al., *supra* note 112, at 958 (acknowledging that “some authors pose that most studies have focused on co-authorship data, in part, because they can be analysed in an easier way than informal indicators of scientific collaboration”) (citing Blaise Cronin, Debora Shaw & Kathryn La Barre, *A Cast of Thousands: Coauthorship and Subauthorship Collaboration in the 20th Century as Manifested in the Scholarly Journal Literature of Psychology and Philosophy*, 54 J. AM. SOC’Y FOR INFO. SCI. & TECH. 855, 855 (2003)).

147. See, e.g., Newman, *supra* note 112, at 5200 (“Coauthorship of a paper can be thought of as documenting a collaboration . . . . The structure of such networks turns out to reveal many interesting features of academic communities. . . . The coauthorship network is as much a network depicting academic society as it is a network depicting the structure of our knowledge.”). What we call “knowledge co-production” others might call “subauthorship collaboration.” E.g., Cronin et al., *supra* note 146, at 856.

inclusive<sup>148</sup>: It is not uncommon for a paper’s authors to include professors, postdocs, graduate students, laboratory technicians, and undergraduates.<sup>149</sup> And in the sciences, authorship data are relatively standardized, with databases like Scopus neatly listing authors and their affiliations for each paper. Citations are another relatively clean data source—but the nodes in a citation network tend to be papers, not people,<sup>150</sup> and citations provide an incomplete picture too.<sup>151</sup> Acknowledgment footnotes (our delicacy of choice) are messier, as are other potential sources of insights into social networks (such as sharing a department, mutual conference participation, friendship, co-teaching, etc.).

Some work has been done with coauthorship in legal scholarship, if relatively little *network* work (more just general statistics). James Farrell and Russell Smyth, for instance, examined Australian law reviews.<sup>152</sup> Although this wasn’t a network analysis, they did note disproportionate representation of men among coauthored articles, as well as a disproportionate share of high-ranked institutions.<sup>153</sup> Tom Ginsburg and Thomas Miles have also noted an increase in legal-scholarship coauthorship, attributing this largely to a rise in empirical legal studies.<sup>154</sup> Tracey George and Chris Guthrie looked generally at the role of collaboration in the development of legal thought, examining coauthorship trends in law reviews.<sup>155</sup> They observe that “lengthy

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148. “Inclusive” in the sense of what tasks merit authorship. Whether scientific authorship is inclusive in terms of hierarchy, race, and gender is another question.
149. Cf. Lisa G. Lerman, *Misattribution in Legal Scholarship: Plagiarism, Ghostwriting, and Authorship*, 42 S. TEX. L. REV. 467, 471 (2001) (remarking, in contrast, that many law professors will use RA-written material in their work but not attribute writing credit—under a variety of tangled justifications).
150. Newman, *supra* note 112, at 5200 (citing Derek J. de Solla Price, *Networks of Scientific Papers: The Pattern of Bibliographic References Indicates the Nature of the Scientific Research Front*, 149 SCI. 510, 510-15 (1965)).
151. E.g., C. Lee Giles & Isaac G. Council, *Who Gets Acknowledged: Measuring Scientific Contributions Through Automatic Acknowledgment Indexing*, 101 PNAS 17599, 17599 (2004) (“[C]itations alone can fall short of describing the full network of influence underlying primary scientific communication. In addition to referencing published material, many researchers choose to document their appreciation of important contributions through acknowledgments. Acknowledgments may be made for a number of reasons but often imply significant intellectual debt.”).
152. James Farrell & Russell Smyth, *Trends in Co-authorship in the Australian Group of Eight Law Reviews*, 39 MONASH U. L. REV. 815, 816 (2013).
153. *Id.* at 824-27.
154. Tom Ginsburg & Thomas J. Miles, *Empiricism and the Rising Incidence of Coauthorship in Law*, 2011 U. ILL. L. REV. 1785, 1787 (2011); see also Tracey E. George, *An Empirical Study of Empirical Legal Scholarship: The Top Law Schools*, 81 IND. L.J. 141, 147, 150 (2006) (noting a growth in empirical legal scholarship and concomitant “trend toward increased collaboration”).
155. Tracey E. George & Chris Guthrie, *Joining Forces: The Role of Collaboration in the Development of Legal Thought*, 52 J. LEGAL EDUC. 559, 561-62 (2002).



acknowledgment footnotes” suggest that “even single-author works are shaped by the insights and input of multiple scholars,” but conclude that generally “collaboration has *not* played a very significant role in the development of legal thought.”<sup>156</sup> Two of us (JT & NP) previously looked at coauthorship in law reviews, finding that highly regarded articles were coauthored more frequently than the baseline rate.<sup>157</sup> Paul Edelman and Tracey George performed a network analysis of legal scholars by coauthorship (but not acknowledgments) to probe connectivity—concluding that Cass Sunstein is the Paul Erdős of law (and explaining that Paul Erdős is the Kevin Bacon of math).<sup>158</sup> But probably the most pertinent look has been by Andrew Hayashi, who *did* conduct a network analysis.<sup>159</sup> Hayashi examined all professor-authored articles in top specialty and generalist student-edited law reviews from 1980 to 2019, generating a hefty set of nearly 70,000 articles and nearly 10,000 repeat-player authors.<sup>160</sup> He matched this data with self-reported demographic information from the Association of American Law Schools (AALS)—namely, gender, minority status, institutional affiliation, and age.<sup>161</sup> From that set he constructed a social network, with professors as the nodes and article coauthorship as the edges.<sup>162</sup>

Hayashi’s dataset spans decades, allowing not only broad-scale network analysis but also a longitudinal view—including a glimpse into the cliquishness of these networks.<sup>163</sup> This is, to our knowledge, the most thorough empirical glimpse into the legal scholarship network yet—and a fascinating one. First, coauthorship is increasing substantially: from 5% of articles in the early 1980s to more than 15% by 2019.<sup>164</sup> This upward trend includes increased

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156. *Id.* at 560.

157. Tietz & Price, *supra* note 1, at 334-35.

158. Edelman & George, *supra* note 100, at 19. For those uninitiated into Bacon metrics, instructive starting points are *Six Degrees of Kevin Bacon*, URB. DICTIONARY, <https://perma.cc/T9FY-G4D8> (archived Oct. 17, 2022); *Six Degrees of Kevin Bacon*, TV TROPES, <https://perma.cc/VPP8-VWSP> (archived Oct. 17, 2022); and *Bacon Number*, SIMPLE ENG. WIKIPEDIA, <https://perma.cc/8FMP-8RDL> (archived Oct. 17, 2022).

159. Hayashi, *supra* note 103, at 6-9.

160. *Id.* at 20. To be specific, Hayashi took the top 100 general and specialty student-edited law journals as ranked by Washington and Lee University. *Id.* at 19-20. Of these, he filtered out certain works—namely, works without a professor author. *Id.*

161. *Id.* at 20-21. Like us, Hayashi inferred gender from Social Security statistical data if an author’s gender wasn’t reported in the AALS directory. *See* Tietz & Price, *supra* note 1, at 322; Hayashi, *supra* note 103, at 21.

162. Hayashi, *supra* note 103, at 15, 24.

163. *E.g.*, *id.* at 28-29.

164. *Id.* at 22. This is consistent with the increase in coauthorship Miles and Ginsburg found among the top fifteen law reviews from 2000 and 2010. Ginsburg & Miles, *supra* note 154, at 1787.

coauthorship across institutions.<sup>165</sup> Second, coauthorship trends are not consistent with coauthorship relationships arising randomly.<sup>166</sup> And third, the legal-scholar network has so-called small-world properties.<sup>167</sup> Intriguingly, it is not only the percent of coauthorship that has increased—so has connectedness. Yet, found Hayashi, coauthoring remains cliquish.<sup>168</sup> The largest connected subnetwork of the dataset (that is, the biggest “island”) entailed about 3% of the network; in the 2010s, it was more than 50%.<sup>169</sup> But this overall connectivity boost doesn’t seem to be from increasing collaboration writ large: As we understand Hayashi’s findings, it is the result of certain frequently coauthoring scholars crossing over between cliques, not broad connectedness among scholars in general.<sup>170</sup> Some scholars coauthor a lot, and some never.<sup>171</sup> And the distribution of each doesn’t reflect random chance.<sup>172</sup> What’s more, the overall amount of “clustering” in the network is several hundred times higher than would be expected by chance.<sup>173</sup> And many scholars, Hayashi points out, are only loosely connected.<sup>174</sup>

What we take from Hayashi’s findings is that, despite increased representation in general, certain groups are likely disadvantaged by the cliquishness of legal scholarship. Coauthorship, of course, is a somewhat stringent measure of social connectedness.<sup>175</sup> It’s a strong measure,<sup>176</sup> but it leaves a lot out, especially in disciplines without a generous coauthorship tradition.<sup>177</sup> There are many forms of what might be called “knowledge co-

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165. Hayashi, *supra* note 103, at 43, 47-48.

166. *Id.* at 7.

167. *Id.* at 21. As Hayashi explains, a “small world” network is one in which (1) the number of scholars is much larger than the number of coauthors, (2) the so-called giant component (the largest network connectivity “island”) covers a large share of the network, (3) the average shortest path in the giant component is small, and (4) there is significant clustering. *Id.* at 35.

168. *Id.* at 28-29.

169. *Id.* at 24.

170. *See id.* at 29.

171. *Id.* at 34.

172. *Id.*

173. *Id.* at 37.

174. *Id.* at 29.

175. Newman, *supra* note 100, at 404-05 (acknowledging stringency); *see also id.* at 404-05 (“[M]ost people who have written a paper together will know one another quite well.”).

176. *See* Uddin et al., *supra* note 100, at 688 (“[C]o-authorship implies a much stronger bond among authors than citation.”).

177. *Cf.* David N. Laband & Robert D. Tollison, *Intellectual Collaboration*, 108 J. POL. ECON. 632, 633 (2000) (noting that collaboration includes not just coauthorship but many other informal mechanisms, and further arguing that “while the incidence and extent of formal intellectual collaboration through coauthorship are greater in biology than

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production,”<sup>178</sup> “subauthorship collaboration,”<sup>179</sup> “intellectual collaboration,”<sup>180</sup> or the like. Many authors who heavily influence each others’ works will never share an article. Thus, it might be that the legal professoriate is far less cliquy than the coauthorship data would suggest. (Or it might be more so.)

We viewed our foray into *acknowledgment*-based networks, then, as a natural complement to Hayashi’s work. The value of acknowledgments as an indicator of the structure of academic communities has been recognized in other disciplines,<sup>181</sup> and we’ve made the case previously.<sup>182</sup> Some network-based work has been done on acknowledgments—but not, to our knowledge, in legal academia, and not nearly to the extent that coauthorship has been scrutinized.<sup>183</sup>

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The scholarship in this area tends to be both utilitarian and institutional in its interest. The questions tend to be practical and focused on research productivity: How do we get the most research bang for our taxpayer buck?<sup>184</sup> How do we maximize productivity?<sup>185</sup> How do we foster collaboration?<sup>186</sup>

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in economics, the incidence and extent of informal intellectual collaboration is greater in economics than in biology”).

178. Tietz & Price, *supra* note 1, at 330-31.

179. Cronin et al., *supra* note 146, at 856.

180. Laband & Tollison, *supra* note 177, at 633.

181. *E.g.*, Cronin et al., *supra* note 146, at 867-69 (comparing acknowledgment practices by discipline and noting that “the importance of acknowledgement to our understanding of how scholars interact with their peers and sundry others, both formally and informally, cannot be gainsaid”); Blaise Cronin, Debora Shaw & Kathryn La Barre, *Visible, Less Visible, and Invisible Work: Patterns of Collaboration in 20th Century Chemistry*, 55 J. AM. SOC’Y FOR INFO. SCI. & TECH. 160, 160 (2004) (making a similar argument); BLAISE CRONIN, *THE SCHOLAR’S COURTESY: THE ROLE OF ACKNOWLEDGMENT IN THE PRIMARY COMMUNICATION PROCESS* 39-108 (1995) (reviewing empirical studies of acknowledgment behavior in scholarship); *id.* at 107 (“[T]here would seem to be a plausible case for using [acknowledgments] . . . as supplementary indicators of intellectual or scholarly influence.”); Giles & Councill, *supra* note 151, at 17599 (“[A]cknowledgments can be considered as a metric parallel to citations in the academic audit process.”).

182. Tietz & Price, *supra* note 1, at 330-46.

183. *E.g.*, Madian Khabsa, Sharon Koppman & C. Lee Giles, *Towards Building and Analyzing a Social Network of Acknowledgments in Scientific and Academic Documents*, in *SOCIAL COMPUTING, BEHAVIORAL-CULTURAL MODELING AND PREDICTION* 357, 363 (Shanchieh Jay Yang, Ariel M. Greenberg & Mica Endsley eds., 2012).

184. *E.g.*, Abbasi et al., *supra* note 104, at 672 (framing analysis in terms of governmental interest in international collaborations that create “new scientific knowledge” and “increas[e] the visibility and authorship of highly productive researchers”).

185. *Id.* at 672.

186. *Id.*

Does collaboration affect impact?<sup>187</sup> How do ideas flow?<sup>188</sup> Which institutions are most influential?<sup>189</sup> Can we predict future performance?<sup>190</sup> Are our researchers being efficient and impactful?<sup>191</sup>

Productivity is a useful goal, of course. But it's not what we're most interested in here. Comparatively neglected so far has been a look at equitable opportunity for the people involved.

Not entirely neglected, though. Hayashi's examination of the coauthorship network of the legal professoriate took a particular eye toward the status of female, minority, and lesbian, gay, and bisexual (LGB) scholars.<sup>192</sup> The share of known LGB scholars has increased since the 1980s.<sup>193</sup> But the rate of increase is slowing for minority scholars and is quite modest for those who are LGB.<sup>194</sup> Hayashi was interested in where these scholars were situated within the broader network. So-called mixed coauthorship (one author within these groups and one not) has indeed increased.<sup>195</sup> But, clarifies Hayashi, that number alone doesn't mean that race, gender, and sexual orientation don't affect coauthorship relationships.<sup>196</sup> To determine if these statuses were assortative, he probed homophily—that is, the “differential probability for co-authorship links to form between nodes with the same attributes.”<sup>197</sup> The result: For every decade and demographic category, there was a positive homophily coefficient, reflecting assortative coauthorship, though decreasing over time.<sup>198</sup> In plain English, legal scholars tend to coauthor more with others like themselves, but less so today than in the past.

To that end, Katz and colleagues' work reinforces the notion that network structure matters.<sup>199</sup> It matters in terms of individual influence and opportunity—both in terms of the population a professor teaches (students who may become practitioners, judges, and academics) as well as her ideas'

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187. *E.g.*, Acedo et al., *supra* note 112, at 958.

188. *See, e.g.*, Katz et al., *supra* note 16, at 81.

189. *See, e.g., id.* at 83.

190. *E.g.*, Abbasi et al., *supra* note 114, at 605.

191. *See* Giles & Councill, *supra* note 151, at 17599.

192. Hayashi, *supra* note 103, at 38.

193. *Id.* For known minority, female, and LGB scholars, the increase in share of legal scholarship from the 1980s to the 2010s was from 4.7% to 11.7%, 17.0% to 34.5%, and 1.8% to 3.9%, respectively. *Id.*

194. *Id.* at 39.

195. *Id.* at 40.

196. *Id.* at 41.

197. *Id.*

198. *Id.* at 42.

199. Katz et al., *supra* note 16, at 78-79.

ability to spread.<sup>200</sup> It's not immediately clear that there's an ideal network structure: Is a cliquy hub-and-spoke network with small, connected groups better, or is a widely dispersed network the ideal?<sup>201</sup> Nonetheless, in our view, the literature underscores that examining the social structure of the legal academic network will allow better insight into how fair the system is and how we can improve it.

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We build here in part on our previous work and in part on Hayashi's work (and of course on the work of scores of nonmale, nonwhite scholars who have been given the burden of starting and sustaining the conversation in the legal academy on hierarchy, race, and gender<sup>202</sup>—many of whom have never received any credit for the work they do<sup>203</sup>). To that end, a few background observations established in the literature are important. Productivity, citation counts, and access depend on one's network; certain people act as academic gatekeepers or brokers; race and gender change the academic experience; etc. Against this background, we sought to both qualitatively and semi-quantitatively probe the legal scholarship landscape through the lens of network theory applied to acknowledgment footnotes.

Before we begin in earnest, a caveat: Acknowledgments are an imperfect way to examine knowledge co-production. When we see an acknowledgment of one scholar by another in a published work, we can reasonably conclude that there is some relationship between the two of them (even if so tangential as an interaction at a conference), and that the acknowledged party contributed something (perhaps substantial, perhaps not) to the work.<sup>204</sup> The inverse is not

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200. See, e.g., Katz et al., *supra* note 16, at 96 (applying a computational information-flow model to institutional networks); *id.* at 100-01; Newman, *supra* note 100, at 404 (explaining that the “structure [of social networks] has important implications for the spread of information”).

201. See Abbasi et al., *supra* note 104, at 673 (noting differences in networks in terms of extent of decentralization); Abbasi et al., *supra* note 114, at 596-97 (exploring theoretical implications of differences in network structures for scholarly performance).

202. See *supra* notes 14-52 and accompanying text. To that end, the literature indicates that women perform a disproportionately large share of service work (which is—because, well, *of course*—considered less prestigious by tenure and promotion committees and, of course, doesn't show up in citation metrics). See Tietz & Price, *supra* note 1, at 344 n.128 (collecting sources); Jewel, *supra* note 1, at 1203.

203. Our previous survey work, for instance, found a wide variety in authors' criteria for inclusion of others in their footnotes. See Tietz & Price, *supra* note 1, at 332-35.

204. These conclusions might not be universally accurate—we have heard anecdotes of fancy folks being acknowledged who claim never to have seen or discussed the project in question, presumably for instrumental reasons—but we think the vast majority of cases support the inferences of some relationship and some contribution.

as easy to interpret. If a scholar is not acknowledged, there may or may not be a relationship; given a relationship, the scholar may or may not have been asked to comment; given the ask, the scholar may or may not have given feedback; and given feedback, the scholar may or may not have been acknowledged.<sup>205</sup> We can thus suggest some likely outlines of relationships and knowledge production in the legal academy through acknowledgments, but with less clarity about what lives in the unacknowledged spaces.

## II. Basic Methodology

We will just briefly review our methods here. Because we built directly on the data used in JT's and NP's prior footnote piece<sup>206</sup> discussed throughout, much of the methodology here is the same, as quoted below.

### A. Article/Footnote Sample Selection

We used the same set of articles and accompanying footnote text as in the prior footnote piece. Accordingly<sup>207</sup>:

We assembled a database of biographical footnotes from 29,024 articles published from 2008 to 2017 in 183 law reviews in the United States—that is, most articles from most generalist law reviews over a decade. We began by downloading all published pieces from each of these law reviews from Lexis, then used a Python script to extract the biographical footnotes, citation, author, and title of each article. The raw database needed some attention to correct apparent typos, extract journal names, and the like. For around two thousand articles, the footnote was not included, and so it had to be fetched manually from Lexis, Westlaw, or HeinOnline. We filtered out, where possible, non-articles (we were interested in the main unit of scholarship in mainstream legal academia) and online supplements.<sup>208</sup>

We note at the outset that this selection process already hampers our ability to examine some dynamics. We did not include articles from legal writing journals, for instance (e.g., *Legal Communication & Rhetoric: JALWD*), which limited our ability to look at scholarly relationships involving legal writing professors.<sup>209</sup> Nor did we examine specialty journals (e.g., the *Michigan*

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205. See *supra* notes 68, 80 and accompanying text.

206. Tietz & Price, *supra* note 1, at 321-22.

207. If this were an article in the national sciences, we would just write, “For methods, see Tietz & Price (2020).” We could also paraphrase at the cost of some accuracy. We view block-quoting as an unsatisfying but acceptable middle ground.

208. Tietz & Price, *supra* note 1, at 321 (footnote omitted). For more detail, see that article.

209. See, e.g., Rachel López, *Unentitled: The Power of Designation in the Legal Academy*, 73 RUTGERS U. L. REV. 923, 925 (2021) (describing a “caste system” in legal academia); Jo Anne Durako, *Dismantling Hierarchies: Occupational Segregation of Legal Writing Faculty in Law Schools: Separate and Unequal*, 73 UMKC L. REV. 253, 254 (2004) (describing the  
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*Technology Law Review*), which limited our ability to look at the same in interdisciplinary contexts. A broader scope would be useful in a future study, but including all legal journals at this stage was logistically infeasible. This was our start.

## B. Footnote Text Processing

We next needed to parse and analyze the raw footnote text—both to obtain crude statistics and to recognize and extract names. So:

We used Microsoft Excel to analyze footnotes (for the easy stuff, like the presence of key words in a footnote or length of a footnote)—supplemented with Python, particularly using the spaCy natural language processing library (for the trickier stuff, like named-entity recognition or part-of-speech tagging).<sup>210</sup>

From there, we sought to annotate the extracted author and acknowledged-person names with information related to academic affiliation, race, gender, and academic subfield.

### 1. Academic affiliation and ranking

For our analysis, we needed a way to correlate author and acknowledged-person names to distinct law professors. We used the AALS list of law professors to identify only law professor authors of the articles in our dataset.<sup>211</sup> We “transposed scanned versions of the 2011 and 2017 editions of the AALS Directory of Law Teachers into a spreadsheet” and “processed the information from there (removing duplicate names, fixing typos where possible, etc.). This yielded 10,101 unique names from the 2011 database, and 12,711 unique names from the 2017 database,” with substantial overlap between the two.<sup>212</sup>

We then matched the names from this list to the names in our database as either authors or acknowledged individuals (or both), yielding 7,063 unique law professors that are the nodes of our network. Researchers have found that algorithmic name-matching is often overinclusive.<sup>213</sup> Given the large size of our database, we prioritized accuracy over quantity. Therefore, we matched

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“segregation” of legal writing faculty). In a notable exception to the general trend among law reviews, legal writing journals are typically peer reviewed. *See, e.g., Submissions*, LEGAL RHETORIC & COMMUN: JALWD, <https://perma.cc/9Y3S-UQ25> (archived Nov. 17, 2022).

210. Tietz & Price, *supra* note 1, at 322 (footnote omitted).

211. *E.g.*, ASS’N AM. L. SCH., THE AALS DIRECTORY OF LAW TEACHERS: 2015-2016 (2015).

212. Tietz & Price, *supra* note 1, at 322.

213. Martha Bailey, Connor Cole, Morgan Henderson & Catherine Massey, *How Well Do Automated Linking Methods Perform? Lessons from U.S. Historical Data* 44-45, (Nat’l Bureau of Econ. Rsch., Working Paper No. 24019, 2019), <https://perma.cc/CSR9-ST7Y>.

both last names and first names. Some scholars go by their middle names, so we checked both middle and first names. We used a database of nicknames compiled by Old Dominion University to match nicknames.<sup>214</sup> Because automated matching is concededly imperfect (among other sample limitations noted above), our results should be interpreted as illustrative rather than exhaustive.

For law school rankings we pulled rankings from U.S. News and World Report (USNWR) for 2012-2016 and used the average for the five years.<sup>215</sup> We assigned a rank of 151 to schools listed as “Tier 2” and 200 for unranked schools.<sup>216</sup> The University of California, Irvine School of Law was only ranked starting in 2015, so we averaged the two available years.<sup>217</sup>

## 2. Race and gender

We attempted to identify race and gender for all scholars listed in our dataset—a complex and potentially fraught task given the lack of readily available, high-quality self-identified gender and race information. We readily recognize that race and gender are more complicated than the binaries we turned to for tractability of analysis. We do not mean to imply, for instance, that all scholars of color have similar experiences.<sup>218</sup> Nevertheless, given the limitations of data (even our large sample does not allow parsing out each racial or ethnic group), and prior descriptions of race and gender effects in academia generally and legal academia specifically,<sup>219</sup> we attempted to categorize professors into binary groups: white versus nonwhite/scholars of color, and men versus women and nonbinary scholars.

First, race. All the scholars in our dataset that Hayashi<sup>220</sup> identified as scholars of color—based on appearing at any point in time in the AALS

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214. Carlton Northern, *Nicknames*, GITHUB, (updated Sept. 8, 2022, 9:19 PM PDT) <https://perma.cc/SWT7-DZSY>.

215. USNWR rankings are concededly problematic and flawed; nevertheless, they are widely used and highly influential. *See, e.g.*, Stephanie C. Emens, Commentary, *The Methodology & Manipulation of the U.S. News Law School Rankings*, 34 J. LEGAL PRO. 197, 197-98 (2009).

216. Paul Caron, *2015 U.S. News Peer Reputation Rankings (v. Overall Rankings)*, TAXPROF BLOG (Mar. 11, 2014), <https://perma.cc/PM7E-8CE8>. A “Tier 2” school is a school that was not ranked in the top 150 but was still ranked by USNWR.

217. *Id.*; Press Release, U.C. Irvine Sch. of L., University of California, Irvine School of Law Ranks No. 30 in First U.S. News Ranking (Mar. 9, 2015), <https://perma.cc/T8B6-3DHK>.

218. *Cf.* Meera Deo, *Why BIPOC Fails*, 107 VA. L. REV. ONLINE 115, 124-27 (2021) (describing strengths and challenges of such simplified grouping).

219. *See supra* Part I.A (referencing scholarship which frequently groups together scholars of color).

220. Hayashi, *supra* note 103, at 20-21.



directory's list of minority professors—we too coded as scholars of color. We supplemented this review with additional manual review, such as membership in relevant organizations (e.g., Black Law Students Association) as noted on law-school biographical webpages. We also manually reviewed the biographical webpages of all professors teaching at the six historically black colleges and university law schools who appeared in our dataset.

Next, gender. We first assigned a “gender likelihood score” resulting from our analysis of the Social Security baby names database.<sup>221</sup> Of course, “this corresponds to sex assigned at birth, which represents another limitation of our data set.”<sup>222</sup> For names overwhelmingly associated with one gender, we used that gender. For ambiguous names, we supplemented this with manual review—for instance, checking what pronouns were used in school websites or other documents. We also compared the genders in our dataset with those Hayashi identified for professors that appeared in both datasets and manually reviewed the few cases of mismatch.

### 3. Academic subfield (at least, tech/IP)

We identified scholars who focused on tech and/or intellectual property by using Michael Madison's list of tech/IP law professors<sup>223</sup> and manually matching names to our sample.

#### C. Network Analysis

We assembled networks in Gephi, a user-friendly network analysis tool that requires essentially no programming ability and uses a graphical user interface rather than a command line.<sup>224</sup> Each professor in our dataset was represented by a single row in a table of network nodes, including information such as school name, school rank, and demographic characteristics. Each line in the table of network edges corresponded to a single acknowledgment, noting the acknowledging professor and the acknowledged professor. Networks were

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221. As we previously explained by example:

[T]he database has 1,228,719 male examples of “Mark” and 3,984 female examples. The gender likelihood score reflects that 99.68% of Marks are listed as male. The name “Pat,” though, has 11,998 male entries and 8,455 that are female—so the score would reflect that this name is 58.66% likely to be male.

Tietz & Price, *supra* note 1, at 322 & n.60.

222. *Id.* at 322 n.61.

223. Michael Madison, *Law, Technology & Society Researchers*, MICHAEL MADISON, <https://perma.cc/K9BR-3XC3> (archived Oct. 21, 2022).

224. GEPHI, <https://perma.cc/U8BL-QAYX> (archived Oct. 21, 2022).

generated using the OpenORD algorithm.<sup>225</sup> Because being acknowledged by someone is not the same as acknowledging someone, the graph was analyzed as a directed graph. Unless otherwise specified, in reporting results we have used the weighted counts of acknowledgments (that is, if Rohelio acknowledges Jane in two separate papers, that counts as two acknowledgments).

We also conducted a regression analysis to see how the race and gender disparities in our network analysis and school rank are related. The dependent variable for all of the regressions is *Weighted Indegree*—the number of times each professor is acknowledged by other professor authors in our sample. The independent variables used included: *White Men*, *Men of Color*, *White WNS* (including nonbinary scholars), *WNS of Color* (including nonbinary scholars), *School Rank*, *Papers Published*, *Race*, and *Gender*.<sup>226</sup> We also did a distribution analysis to see how race and gender are distributed across law school rankings.

### III. Results

We mapped the network of law professors based on acknowledgments (Figure 1, below). Arrows represent acknowledgments. The nodes are shaded by approximate school rank from pink (higher ranked) to green (lower ranked) and sized by the number of acknowledgments for that professor in our network.

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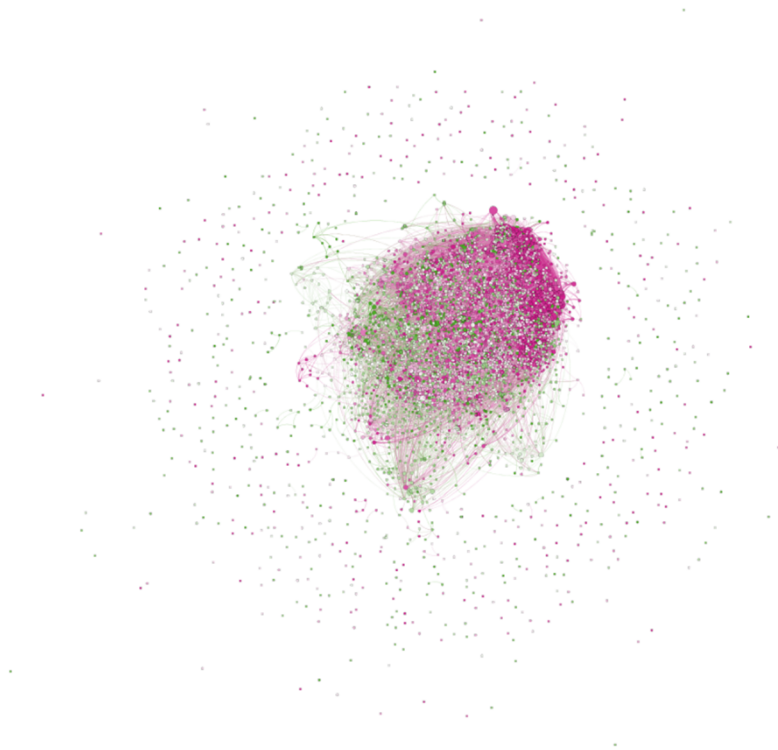
225. See, e.g., Shawn Martin, W. Michael Brown, Richard Klavans & Kevin W. Boyack, *OpenOrd: An Open-Source Toolbox for Large Graph Layout*, 7868 PROC. SPIE 786806, at 2 (2011), <https://perma.cc/NVF4-TP5B>.

226. WNS = Women and Non-Binary Scholars. In most regressions, *White Men* was omitted due to collinearity.

**Figure 1**  
The Network of Law Professors

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Structure is difficult to discern, but there appears to be some separation based on school ranking (which we explore more below<sup>227</sup>). Since the full map is hard to see much structure on, consider instead the next-pictured network of 351 law professors who do tech/IP (Figure 2). Here, the big pink dot is Mark Lemley, who is the undisputed most-acknowledged professor in our entire sample (including the full network above), with 170 acknowledgments (nearly twice the next most-acknowledged professor).

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227. See *infra* Part III.B.

**Figure 2**  
The Network of Tech/IP Law Professors

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A. Basic Results

There were 7,063 professors in our full dataset. Nearly half (3,338) are authors of papers in the dataset, with a median of two dataset papers published (and a mean of 2.35).<sup>228</sup> Professors were acknowledged a median of 3 times and a mean of 6.3 times; the vast majority of professors in the network (6,025) were acknowledged at least once. Scholars were spread across school ranks, as shown in Table 1.

**Table 1**  
Number of Professors in Network by School Rank

School Rank	Number of Professors in Network
1-20	1,370
21-50	1,260
51-100	1,742
101-150	1,225
151+	1,466

A few basic network statistics (which you can safely ignore unless you're both familiar with network analysis and curious): The network diameter (the shortest distance between the two most distant nodes) was 15. The average path length between any two professors was 4.65. The graph density (how many ties exist over all possible ties) is very low: 0.001.

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<sup>228</sup> The median number of papers published in the dataset across all professors in the network was zero (since fewer than half of the listed professors were authors).

Table 2 shows the 25 most-acknowledged scholars in our dataset. Of the 25, 20 are men and 20 are white (16 are both):<sup>229</sup>

**Table 2**  
Most Frequently Acknowledged Professors

Name	School <sup>230</sup>	Acknowledgments
Mark Lemley	Stanford	170
Dan Markel	Florida State	93
Kevin Stack	Vanderbilt	76
David Schwartz	Wisconsin	74
Aziz Huq	Chicago	74
Henry Monaghan	Columbia	74
Lawrence Solum	Georgetown	73
Eric Posner	Chicago	72
Rebecca Tushnet	Harvard	72
Melissa Murray	UC Berkeley	70
Christopher Slobogin	Vanderbilt	70
Mark McKenna	Notre Dame	68
Hiroshi Motomura	UCLA	68
Mark Tushnet	Berkeley	68
Miriam Baer	Brooklyn	66
Timothy Holbrook	Emory	65
Carissa Hessick	UNC	64
Barry Friedman	NYU	64
Samuel Issacharoff	NYU	64
Joseph Blocher	Duke	63
Kevin Johnson	UC Davis	63
Jack Balkin	Yale	63
Brandon Garrett	Virginia	62
Lee Fennell	Chicago	62
Richard Fallon	Harvard	61

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229. We fully acknowledge that each of our classifications on this front carries a degree of uncertainty—it's all as far as we know.

230. Schools are listed as they appear in our dataset; some scholars have since moved.

The number of links in a network isn't everything, of course. That is, the literature on social network analysis as applied to academia has emphasized that a scholar's centrality in a network (i.e., their positioning in the web) also matters in terms of framing their influence or engagement in the scholarly community.<sup>231</sup> We observed informally that there were often differences between a relative scholar's position in the rankings for number of acknowledgments and for any given centrality metric (though we hesitate to draw any particular conclusions from individualized centrality metrics—the aggregate picture is more meaningful). We did observe, however, that school rank tended to correlate with acknowledgment count—but less so with betweenness centrality (see Figures 3A and 3B below).<sup>232</sup>

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231. *See supra* notes 114-19 and accompanying text.

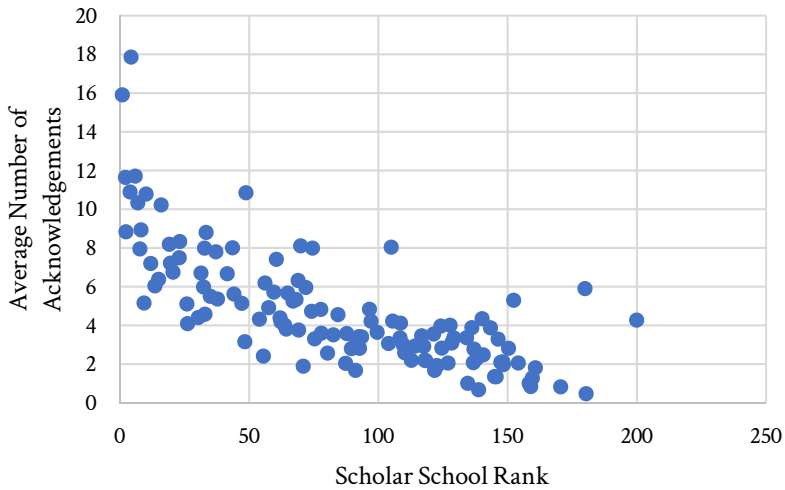
232. "Betweenness centrality" is a measure of how central a node is in a graph based on the shortest paths between nodes. A higher centrality means that a node is situated among more of the shortest paths between other nodes (just like Indiana claims to be the "Crossroads of America").

B. Hierarchy

We found distinct hierarchical effects, with evidence that scholarly networks and knowledge co-production are shaped by school rank of both authors and acknowledged scholars.

Scholars from higher-ranked schools are acknowledged more often than scholars from lower-ranked schools, as shown in Figure 3A:

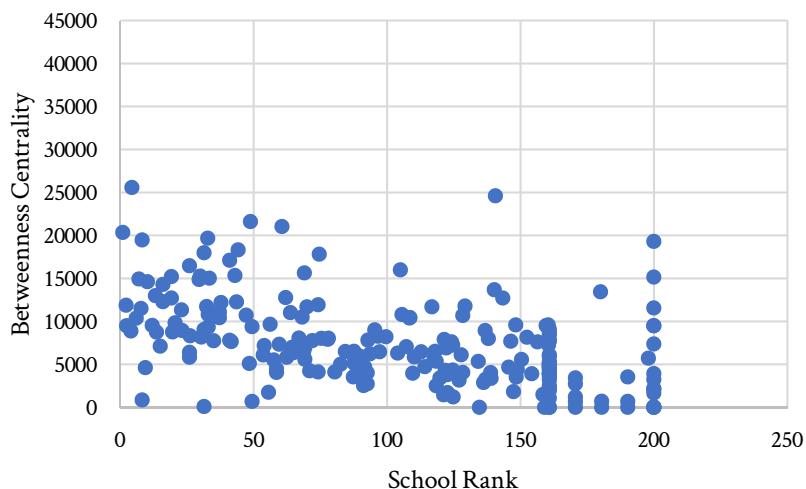
**Figure 3A**  
Acknowledgements by School Rank





Interestingly, somewhat less of a visual trend is apparent between school rank and betweenness centrality, though higher-ranked schools do also tend to have scholars with higher centrality, as shown in Figure 3B:<sup>233</sup>

**Figure 3B**  
Betweenness Centrality by Scholar School Rank

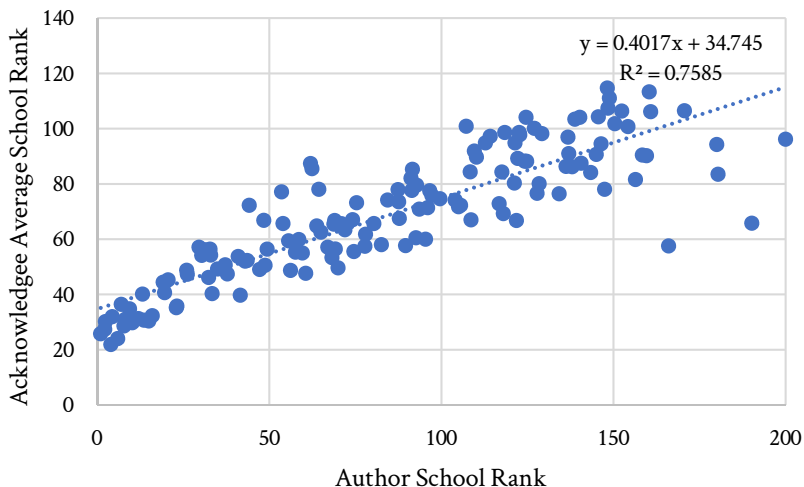


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233. Betweenness centrality was calculated here using undirected edges.

Authors also tend to acknowledge scholars from schools that are similarly ranked to their own, as shown in Figure 4:

**Figure 4**  
Average School Rank of Acknowledgees



A substantial fraction of this effect is due to own-school acknowledgments: 25% of all acknowledgments in our dataset are to scholars at the author's own school. The fraction of own-school acknowledgments varies substantially among law schools. We looked at schools with evidence of unusually strong internal scholarly networks, and at schools with evidence of unusually strong networks that crossed school boundaries (excluding schools with a small number of author acknowledgments to evaluate).<sup>234</sup> South Texas, Georgia State, Drexel, Denver, Western New England, and Arkansas (Little Rock) all had particularly strong internal scholarly networks, with over 40% own-school acknowledgments. New Hampshire, Kansas, North Dakota, and William & Mary all had particularly strong cross-boundary scholarly networks, with more than 90% other-school acknowledgments. Among the

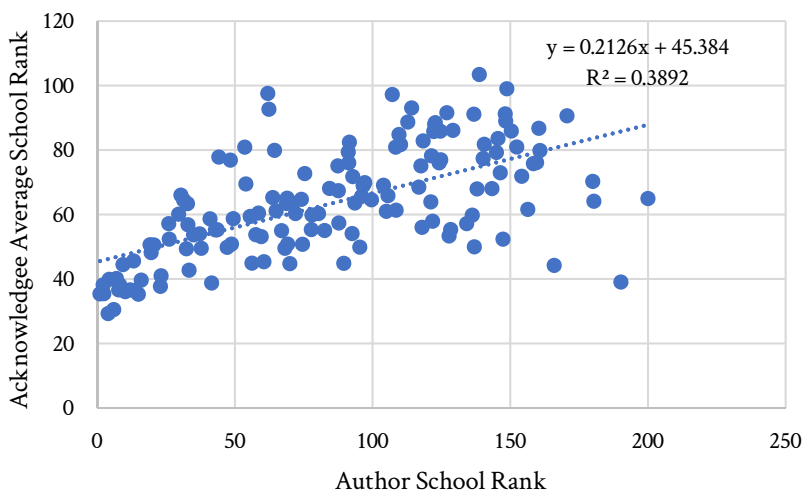
234. Of the 201 schools in our dataset, 121 had at least 100 acknowledgments made by authors associated with that school; we included those 121 in this analysis.

T14 law schools,<sup>235</sup> Harvard has the most in-school acknowledgments (30%) and Penn the fewest (11%). There is no significant correlation between school rank and the fraction of own-school acknowledgments.

When own-school acknowledgments are removed, however, authors still tend to acknowledge scholars at schools that are similarly ranked to their own institution, suggesting that knowledge co-production and scholarly networks have a distinct “peer-school” bias, as Figure 5 shows. Half of all acknowledgments are to scholars at schools within twenty of the author’s own school in the US News ranking.

**Figure 5**

Average School Rank of Acknowledgees (Excluding Own-School Acknowledgements)



In addition to a peer-school bias, authors tend to more frequently acknowledge scholars at higher-ranked institutions than those at their own.

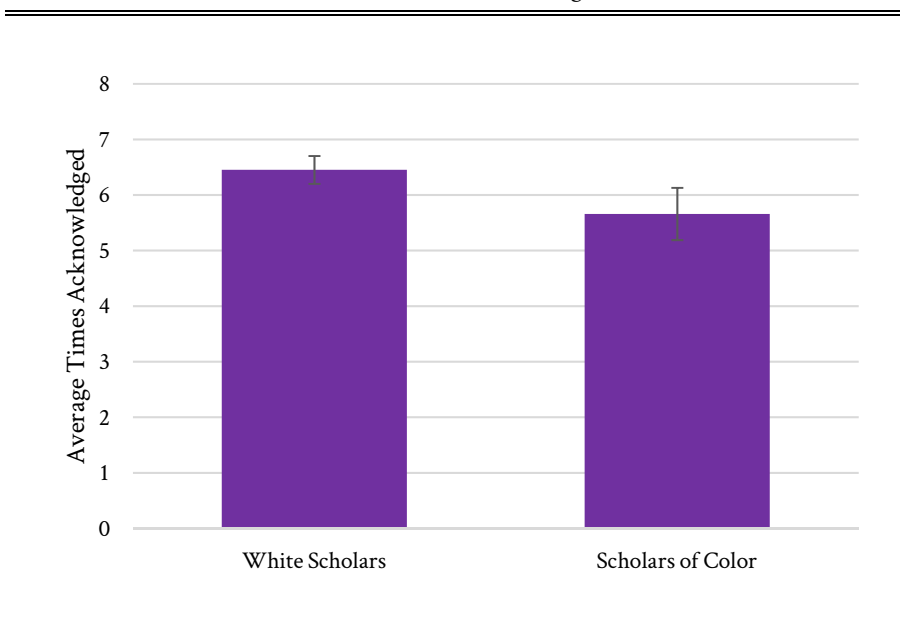
235. T14 refers to the law schools traditionally ranked within the top 14 by U.S. News & World Report: Berkeley, Chicago, Columbia, Cornell, Duke, Georgetown, Harvard, Michigan, Northwestern, NYU, Penn, Stanford, Virginia, and Yale. See *Top Law School Rankings from U.S. News*, 7SAGE, <https://perma.cc/35P8-N4RX> (archived Oct. 21, 2022). UCLA, sometimes ranked in the top 14 but not a traditional member of the T14, see *id.*, has 38% in-school acknowledgments.

Acknowledged scholars were on average at schools ranking seven spots higher than those of the authors acknowledging them.<sup>236</sup>

C. Race

White scholars are acknowledged about 14% more on average than scholars of color ( $p < 0.01$ ), as shown in Figure 6:

**Figure 6**  
White Scholars Are Acknowledged More

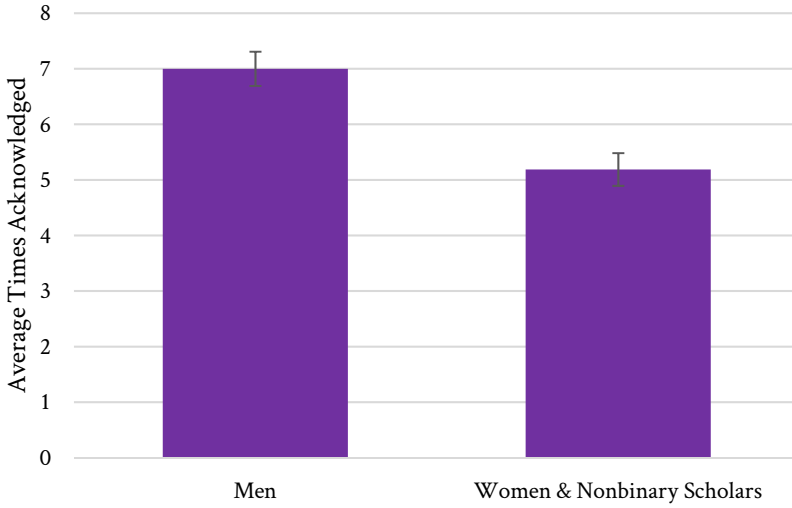


236. The amount of “acknowledging up” varies with school rank, some of which should be mathematically expected; those at Yale, for instance, can acknowledge only either their own colleagues or scholars at lower-ranked schools.

D. Gender

Men are acknowledged about 35% more on average than women and nonbinary scholars ( $p < 0.00001$ ), as shown in Figure 7:

**Figure 7**  
Men Are Acknowledged More

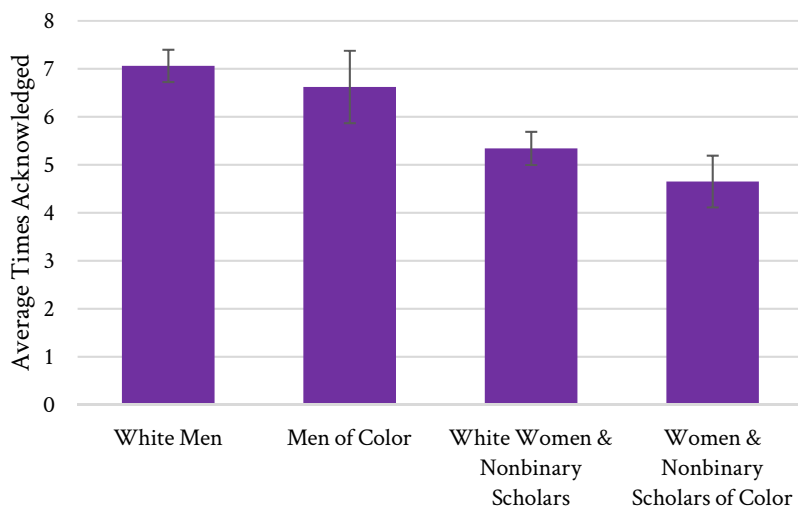


E. Intersectionality

Of the 7,063 scholars identified in our dataset, 53.4% are white men, 29.3% are white women and nonbinary scholars, 8.8% are men of color, and 8.5% are women and nonbinary scholars of color.

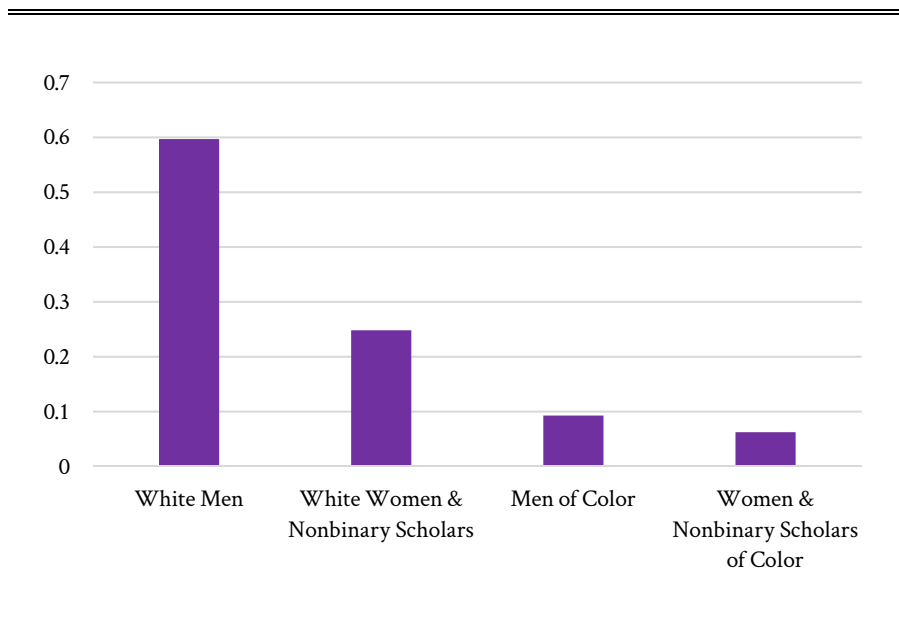
Recognizing that race and gender are not independent factors but are highly intersectional, we looked at rates of acknowledgment by both characteristics together, as shown in Figure 8. Race seems to matter less within gender for how much a scholar is acknowledged. All differences are highly significant except the difference between white men and men of color, which is statistically insignificant, and that between white women/nonbinary scholars and women/nonbinary scholars of color, which is only moderately statistically significant ( $p = 0.035$ ).

**Figure 8**  
Intersectionality Effects



In the aggregate, white men receive 60% of acknowledgments, white women and nonbinary scholars 25%, men of color 9%, and women and nonbinary scholars of color 6%, as shown in Figure 9:

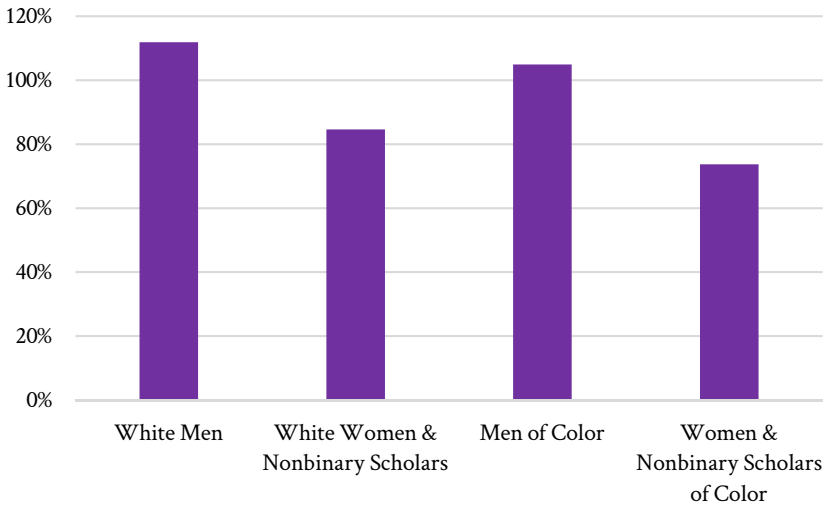
**Figure 9**  
Fraction of Acknowledgments



Of course, since white men are the majority of our sample, at 53.3%, and the most populous group in the legal academy overall,<sup>237</sup> it is unsurprising that they are acknowledged most. Figure 10 shows the differences that emerge when we look for over- or under-acknowledgment relative to population prevalence—that is, by dividing the fraction acknowledged by the fraction of that group in our overall study population. If white men make up 53% of the study population, all things being equal we’d expect them to make up 53% of acknowledgments. All things are not equal, of course, and white men make up 60% of acknowledgments: They are over-acknowledged. Men generally are over-acknowledged, and women and nonbinary scholars, especially of color, are under-acknowledged.

237. DEO, *supra* note 2, at 4 (explaining that “almost three-quarters . . . of all law faculty are white” and that white men in particular are represented at nearly twice the rate of the next highest group, white women—at about half of full-time faculty).

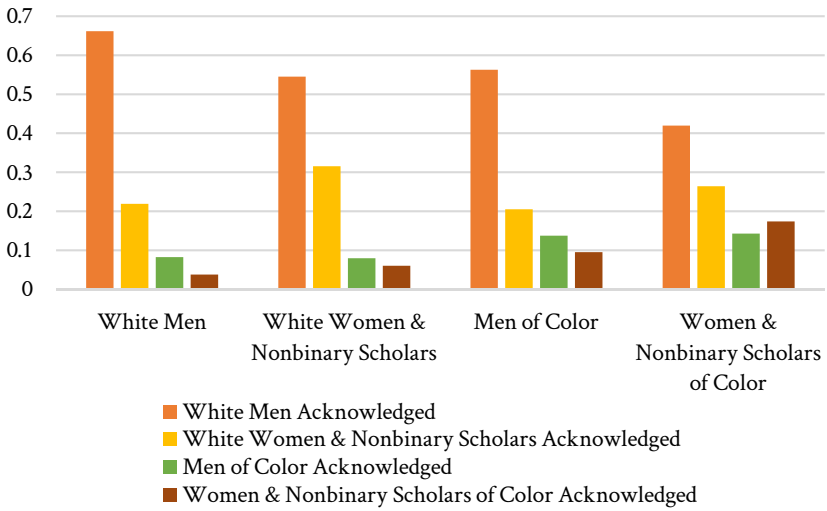
**Figure 10**  
Over/Under-Acknowledgment



We can break this down more to look at who acknowledges whom by race and gender. Figure 11 shows the fraction of acknowledgments by group; each set of columns shows the distribution of that author group’s acknowledgments by race and gender. All groups acknowledge white men most, but the patterns differ substantially by author characteristics.

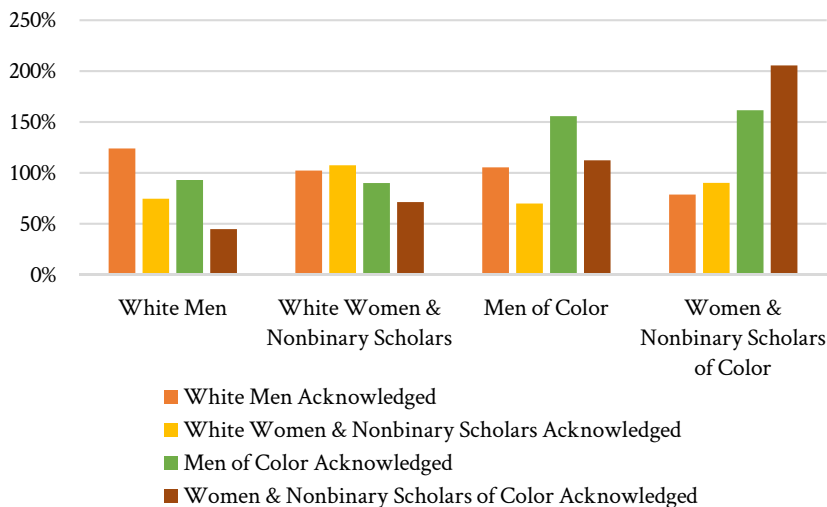


**Figure 11**  
Fraction Acknowledged by Author Race/Gender



Over- and under-acknowledgment accordingly breaks down differently by author group, as Figure 12 shows:

**Figure 12**  
Over/Under-Acknowledgment by Author Race/Gender



Every group over-acknowledges its own group<sup>238</sup>—indeed, 47% of all acknowledgments are to scholars of the same group. White women do this the least (and are the only group to—very slightly—over-acknowledge white women). Women and nonbinary scholars of color appear to show the strongest in-group networks, acknowledging other women and nonbinary scholars of color at over twice their presence in the general population of scholars. Scholars of color of all genders acknowledge men of color at more than 150% their presence in the general population. White scholars, on the other hand, acknowledge scholars of color less than one might expect based purely on prevalence; white men, in particular, acknowledge women and nonbinary scholars of color at less than half their prevalence in the population.

238. Again, we recognize the artificiality of our “groups,” but use them nonetheless as the best we can do. *See supra* notes 218-19 and accompanying text.

F. School Rank and Race/Gender

Seeing that professors have a tendency to “acknowledge up,”<sup>239</sup> and that top-ranked law schools are thought to have less diverse faculty,<sup>240</sup> we further analyzed how the race/gender disparities in our network analysis are related to this relationship. For this task we performed regressions. Our results suggest that both school ranks and demographics cause some of the observed disparity.

Tables A3-A6 in the Appendix show the distribution of four demographics (defined in our set as the variables named *White Men*, *Men of Color*, *White WNS* (*Women & Nonbinary Scholars*) and *WNS of Color*,<sup>241</sup> with the latter two including nonbinary scholars across school rankings. Since law schools have varying faculty sizes, we couldn’t simply consider the gross number of professors. While we do not have faculty size in our dataset, we do have a large dataset of professors and their demographics and affiliations. So we broke the rankings up into ten bins, then counted how many *White Men*, *Men of Color*, *White WNS*, and *WNS of Color* were in each bin, then divided by the total number of professors in that bin. Then we did a z-test to compare the percent of each bin to the total proportion of the demographic. So, for example: The first bin (schools ranked 1-20) is 0.60 *White Men* and our total dataset is 0.53 *White Men*; this has a p-value of basically 0, and so the fraction of white men in the highest ranked schools is statistically significantly higher than in legal academia as a whole—at least within our sample of identifiable law professors publishing in general-purpose law reviews over a 10-year period.<sup>242</sup> The fraction of *Men of Color* at top ranked law schools is about average; indeed, *Men of Color* seem to be the most evenly distributed and to have the lowest correlation with school rank. *White Men* is the only variable to have a negative correlation with school rank.<sup>243</sup> A “negative” correlation means more placement in better-ranked schools, since higher-ranked schools have a lower number assigned to the school-rank variable (e.g., “1” is a high rank but a small number). The fractions for both *White WNS* and *WNS of Color* are statistically

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239. See *supra* note 236.

240. See, e.g., Afra Afsharipour (@AfraAfsharipour), TWITTER (Sept. 30, 2021, 9:46 AM), <https://perma.cc/B9BF-PEZC> (“The lack of gender and racial diversity among the business law faculty [and] the elite law schools is significant.”).

241. Because these terms are numeric variables in our analysis, we have capitalized them in this discussion.

242. See *infra* Table A3. These percentages are only useful in comparison to each other, not as independent values. For example, we cannot conclude that 53% of law professors are white men, nor that 60% of law professors at the top-20 ranked schools are white men. We did not run any statistical tests on these numbers, only on the difference between the percentage at different rankings.

243. See *infra* Table A1. *Men of Color* has a correlation of 0.0084 with *School Rank*, while *White Men* has -0.0640, *White Women* has 0.0320, and *WNS of Color* has 0.0537.

significantly lower at top ranked law schools than at lower ranked law schools. Overall, school rank and race/gender are related: White men are more common at the highest-ranked institutions, and women and nonbinary professors, whether white or scholars of color, are relatively more common at lower-ranked institutions.

The dependent variable for all of the regressions is how many times each professor was acknowledged by others in the sample. Most regressions did not include *White Men* because of collinearity. Regression 1 shows negative coefficients for *Men of Color*, *White WNS*, *WNS of Color*, and *School Rank*—all except *Men of Color* are statistically significant.<sup>244</sup>

All of the regressions had negative coefficients for *Men of Color*, *White WNS*, and *WNS of Color*. Professors in these groups are less acknowledged by others in the network. The effect is strongest for women and nonbinary scholars of color, intermediate for white women and nonbinary scholars, and weakest for men of color.<sup>245</sup>

Including *School Rank* in the regressions with the demographic variables results in statistically significant coefficients for *School Rank* and most of the demographic variables, suggesting that the disparity in the network is attributable to both school rank as well as race/gender independently, even though race/gender demographics also vary with school rank. That is to say, not all of the network disparity is caused by school rank or even by the number of papers published. Effects of race and gender remain.

These results do suggest something with respect to interventions. If top-ranked law schools hired more diverse faculty, at a rate more akin to lower-ranked law schools, this could address some of the network disparity. This effect would likely be more significant for women and nonbinary scholars, because these groups are less evenly distributed across school hierarchy, and accordingly less for men of color.

### G. Patterns in the Tech/IP Law Subcommunity

We used the tech/IP law subcommunity (as broadly defined by Mike Madison) to examine a few patterns, hypothesizing that within a subcommunity we should expect to see some insularity within the community

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244. Top law schools have a “lower” ranking (i.e., a lower value for the *School Rank* variable), so the negative coefficient shows that professors at top law schools are better connected. Regressions 2 and 3 added *Papers Published* or *School Rank*, and these variables did not substantially change the results.

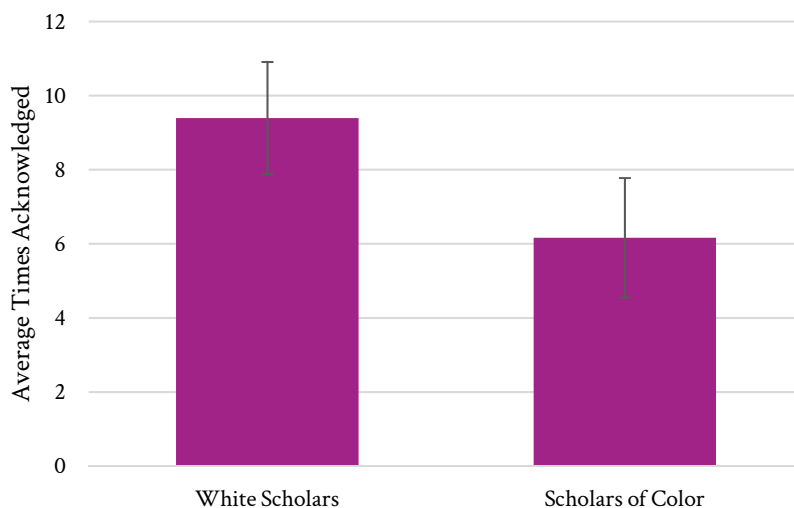
245. Due to multicollinearity, we cannot run a regression with all four binary demographic variables (that is, together they sum to 1, meaning that any fourth can be derived from three others). Regressions 6 & 7 accordingly include *White Men* instead of *Men of Color*; both regressions have a positive but statistically insignificant coefficients for *White Men*.

and (perhaps) less own-school acknowledgment. (Why *that* subcommunity? For starters, it is the one we're most familiar with. Further, Madison's list made it a ready starting point for analysis.) The sample size is of course much smaller; 351 individuals matched in our dataset. In our dataset, the tech/IP community was 57.8% white men, 22.8% white women and nonbinary scholars, 11.4% men of color, and 8.0% women and nonbinary scholars of color (for comparison, the overall sample is 53.4% white men, 29.3% white women and nonbinary scholars, 8.8% men of color, and 8.5% women and nonbinary scholars of color).

We saw somewhat less subject specificity than might be expected: Barely over half of acknowledgments by tech/IP professors were to other members of that subcommunity (51.6%). Own-school citations were lower, however, as might be expected for a community with relatively few professors per school: 17.2% of tech/IP author acknowledgments were to scholars in their own schools, as opposed to 25% of professors in the general sample.

We found that in tech/IP, white scholars are acknowledged about 52% more than scholars of color ( $p = 0.005$ ), as shown in Figure 13:

**Figure 13**  
White Tech/IP Scholars Are Acknowledged More



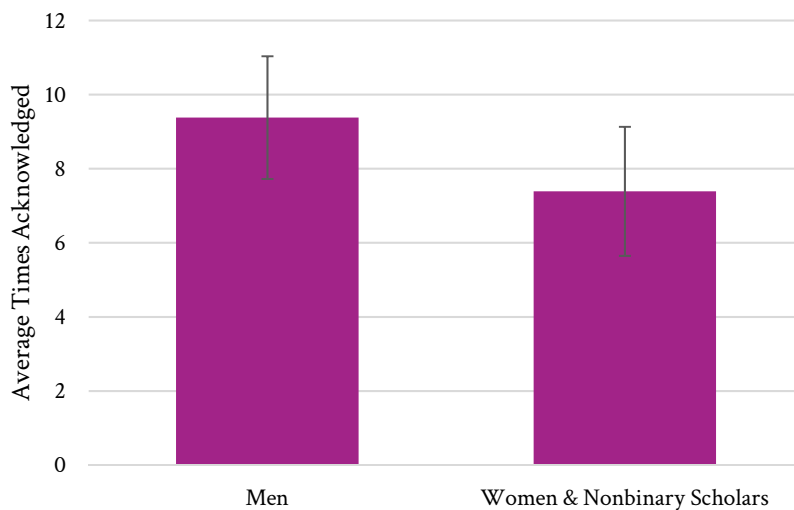
In tech/IP, men are also acknowledged about 26% more than women and nonbinary scholars, though the difference is not statistically significant ( $p = 0.11$ ), as shown in Figure 14:

**Figure 14**

Tech/IP Men Are Acknowledged More—But It’s Not Statistically Significant

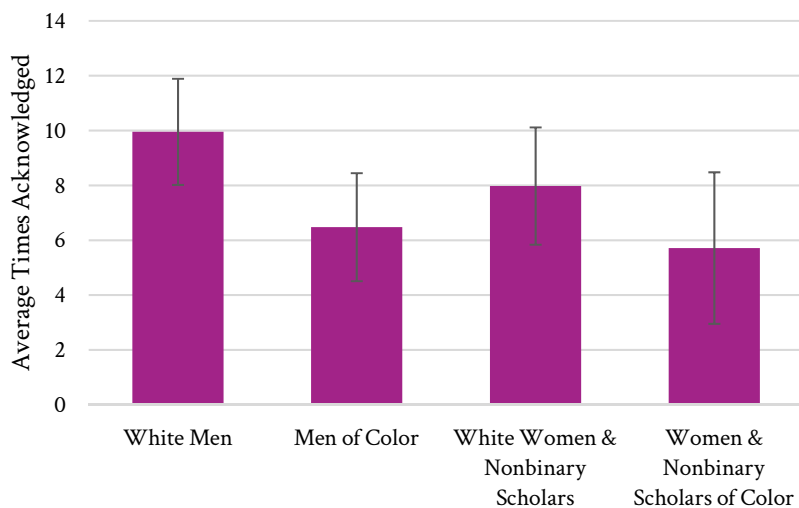
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Looking at intersectionality, the only significant inter-group differences are between white men and men of color ( $p = 0.01$ ) and white men and women and nonbinary scholars of color ( $p = 0.02$ ), as shown in Figure 15. All other pairwise differences were statistically insignificant.

**Figure 15**  
Intersectionality Effects in Tech/IP



You might wonder whether the presence of Mark Lemley, the most-acknowledged individual in the full dataset and a white man, might dominate these effects in the smaller tech/IP dataset. It doesn't. Removing Lemley from the sample doesn't change any patterns or move any results from statistical significance to insignificance (or vice versa).

#### IV. Discussion and Concluding Thoughts

Our data show disturbing evidence that hierarchy, race, and gender are implicated in the structure of scholarly networks, including in knowledge co-production in legal scholarship. That is, it is not just citation counts or article placement that are different for these groups: It is the social network of legal academia.

As we noted at the outset, acknowledgments are an imperfect proxy for the scholarly community. For instance, over-acknowledgment of white men

could reflect active or implicit racial bias on the part of authors; the structural inequalities that cause women and especially women of color to have increased informal service expectations<sup>246</sup> and thus *possibly* less time to offer comments; or differential attendance at conferences, where bigwigs may both have the resources to attend more conferences and may also be disproportionately white and male. Relatedly, it could reflect the potential race and gender imbalance of questions and comments at conferences independent of who attends.<sup>247</sup> Or it could reflect the tendency of some authors to try to cultivate particularly fancy or senior authors in their acknowledgments, who are disproportionately white and male. It may reflect the varied demographics of subfields, each of which might have its own acknowledgment norms. Finally, it could also reflect the desire by some senior faculty members, likely disproportionately white men, to give back to the community; or any number of other possibilities.<sup>248</sup> There are many possibilities, even if few of them are really *untroubling*. We can present patterns and suggest possible interpretations, but fully understanding scholarly networks and knowledge co-production should include robust qualitative work that is outside our scope here. Further quantitative work could also be fruitful.<sup>249</sup> Still, given the stringent authorship norms of legal academia, and the narrow topical dependence of citations, we at least think that acknowledgments, imperfect as they may be, represent a rich complement to the existing picture of the network landscape based on coauthorship and citations. Acknowledgments probably present a fuller view of academic communities.

Even if acknowledgments *aren't* a good reflection of underlying scholarly networks, relationships, and interactions, the imbalances observed above are problematic—especially absent any conceivable and demonstrable innocuous explanation. In prior work, two of us (NP & JT) have shown that acknowledgments matter in the law-review placement process, which in turn matters for scholars more generally (more than it should, certainly). While we focused in that work on the instrumental value of *acknowledging* other scholars in placing a work, if acknowledgments are a kind of academic currency, then

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246. See *supra* notes 28, 42 and accompanying text.

247. See, e.g., Nicholson Price (@WNicholsonPrice), TWITTER (Mar. 30, 2019, 5:24 PM), <https://perma.cc/XG2R-X637>.

248. For instance, could the acknowledgment practices of constitutional law—notoriously white-male-driven—be different from intellectual property?

249. Future work could quantify seniority-based impacts, account for movement between institutions, look more comprehensively at differences between subfields, include specialty journals, examine changes over time, or in other ways extend the introductory analysis presented here. We note for others' benefit that the cooperation of LexisNexis, Westlaw, and/or AALS, none of which we were able to secure, would substantially ease such endeavors.



inequality in the spending and receipt of that currency is itself troublesome, *even if* it doesn't say much about underlying relationships. After all, the point might be that some groups are valued less than others by authors, even if inadvertently. But we think that acknowledgments *do* say useful things about underlying relationships—or, at least, that they suggest problems that accord with the strong qualitative and semiquantitative work that already exists in this field, and thus lend supporting quantitative evidence to those points.

Scholarly networks reflect law school hierarchies; authors tend to acknowledge scholars at schools near theirs in rank. There are many possible explanations, and it's difficult to pin one (or more) down. It might be that folks at high-ranked schools have lots of free time to give sagacious comments, or that they have funds to travel to conferences and offer thoughts, that they just prefer to interact with and acknowledge others at other fancy places, or that they preferentially address feedback from those at those places and only acknowledge those whose feedback they address. But to the extent that hierarchical acknowledgments reflect scholarly networks, we should at least wonder whether that's healthy. Initial placement into academic positions is heavily pedigree-based, after all. And so if one's scholarly network largely hovers around where one first lands, that's a problem both for dispersion of ideas as well as for upward academic social mobility. And recall: This prestige-proximity postulate isn't simply explainable by same-school citing, nor by other properties of highly placed articles (for example, that higher-ranked journals tend to have articles with more acknowledgments). If publication, research, and mentorship can increasingly be done across institutions (and even over Twitter), shouldn't scholarly networks increasingly bridge the prestige gap? (That said, it's beyond our current data to look longitudinally. Perhaps professors' prior prestige-proximity proclivity will pass.)

Scholarly networks have racialized, gendered, and intersectional disparities. These disparities are *prima facie* problematic, though some subset seem justifiable (for instance, we see little to criticize about members of underrepresented minorities building strong scholarly networks within those groups). The contours of these disparities are complex, and the overlap of differing effects is nonobvious (for instance, racial demographics vary somewhat by school rank). But patterns of acknowledgment provide suggestive quantitative evidence to support existing claims that scholars of color, women and nonbinary scholars, and especially women and nonbinary scholars of color are systematically excluded, at least partially, from aspects of legal scholarly networks and interactions. This is, to put it mildly, deeply problematic.

What to do? The most trivial intervention, and the most straightforward, is to ensure that if scholars from underrepresented groups *do* contribute to a paper, they are most certainly acknowledged. We would encourage authors to make a special effort to pay attention to their acknowledgments and not, for

instance, default to acknowledgments of casual comments by fancy usual suspects at the expense of contributions by those outside the spotlight.

At a deeper level, many interventions to better integrate scholars outside the white-male default have been suggested,<sup>250</sup> and we hope that such suggestions would help increase integration into scholarly networks. Efforts to increase diversity and representation at conferences, especially small conferences where most participants are expected to contribute, would likely help build more diverse scholarly networks. Conferences that foster close connections are an especially attractive option; the Junior Scholars in IP conference at Michigan State University, for instance, connects senior IP scholars with juniors in the field, and uses a double-blind selection process.<sup>251</sup> Reaching out to more diverse scholars for comments is, of course, something of a double-edged sword: On the one hand, strengthening diverse networks seems to be an unarguable good, but on the other hand, burdening scholars from underrepresented groups with additional informal obligations adds to the already heightened loads carried by such scholars.<sup>252</sup> Decreasing those other burdens is itself an important goal, which may free up space and time for additional scholarly engagement. Best suited to advancing all these efforts, of course, and to increasing the diversity of scholarly networks—with the concomitant benefits to collegiality and the quality of scholarship—are efforts to diversify the legal academy itself. Build a diverse legal academy and the network effects will help with the rest.

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250. See, e.g., Veryl Victoria Miles, *Recruiting and Retaining Faculty of Color in the Legal Academy: A Longstanding Commitment of the Association of American Law Schools*, 10 WASH. & LEE RACE & ETHNIC ANC. L.J. 65, 67 (2004); Priya Baskaran, *Service, Scholarship, and Radical Citation Practice*, 73 RUTGERS U.L. REV. 891, 908-09 (2021).

251. *The Twelfth Annual Junior Scholars in Intellectual Property (JSIP) Workshop*, MICH. ST. U. COLL. OF L., <https://perma.cc/4Q6V-CGMV> (archived Oct. 21, 2020).

252. Haines, *supra* note 52, at 309; Baskaran, *supra* note 250 at 895.

## Appendix

### A. Statistical Gender Scoring: Detailed Methods

In a perfect world, we would have the self-identified gender of each person in our study. Since we did not have that data we instead used a statistical-likelihood approach. The Social Security Administration provides tables of baby names with more than five occurrences on birth certificates for each year, along with the sex specified on the birth certificate. 143 tables were downloaded spanning from 1950 to 2000, inclusive. From the aggregated tables, a list was compiled comprising all 64,023 unique names. Then, for each name, the number of female or male occurrences were found. A gender excess ( $G$ ) was calculated for each name:

$$G = \frac{M - F}{M + F}$$

In which  $M$  is the number of male occurrences and  $F$  is the number of female occurrences. Accordingly, a male-only name would be  $G = 1.0$ , a female-only name would be  $G = -1.0$ , and an evenly split name would be  $G = 0.0$ . Likewise, a 3:1 male/female ratio would yield a  $G = 0.5$ . The idea behind  $G$  is to estimate the gender skew of a population. A 1:1 population has no skew ( $G = 0.0$ ). In a 3:1 population, 50% of the population is skewed ( $G = 0.5$ ).  $G$  was then calculated for each person in our database. If  $G > 0.90$  then they were assigned a 0 for gender, and if  $G < -0.90$  then they were assigned a 1 for gender. We then manually filled in everyone whose  $G$  was not in that range and whose name was not captured in the Social Security lists.

B. Summary Statistics & Regressions

For all tables and regressions:

\*\*\*  $p < 0.001$

\*\*  $p < 0.01$

\*  $p < 0.05$

WNS means Women and Nonbinary Scholars

**Description of Variables**

<b>race</b>	Binary	1 = scholar of color
<b>gender</b>	Binary	1 = woman or nonbinary scholar
<b>Papers Published</b>	Non-continuous	# of papers published
<b>White Men</b>	Binary	1 = white man
<b>Men of Color</b>	Binary	1 = man of color
<b>White WNS</b>	Binary	1 = white woman or nonbinary scholar
<b>WNS of Color</b>	Binary	1 = woman or nonbinary scholar of color
<b>School Rank</b>	Continuous	Average of school rank from 2012 to 2015.
<b>Weighted Indegree</b>	Continuous	# of times each professor is acknowledged by other professor authors in our sample.

**Table A1**  
Correlation Matrix

	<i>race</i>	<i>gender</i>	<i>Papers Published</i>	<i>White Men</i>	<i>Men of Color</i>	<i>White WNS</i>	<i>WNS of Color</i>	<i>School Rank</i>
<i>race</i>	1.0000							
<i>gender</i>	0.1052	1.0000						
<i>Papers Published</i>	0.0122	-0.0120	1.0000					
<i>White Men</i>	-0.4894	-0.8339	-0.0044	1.0000				
<i>Men of Color</i>	0.6806	-0.2426	0.0283	-0.3331	1.0000			
<i>White WNS</i>	-0.2946	0.8264	-0.0052	-0.6892	-0.2005	1.0000		
<i>WNS of Color</i>	0.6649	0.3902	-0.0123	-0.3254	-0.0947	-0.1959	1.0000	
<i>School Rank</i>	0.0459	0.0610	-0.0734	-0.0640	0.0084	0.0321	0.0537	1.0000

**Table A2**  
Standard Deviation of Variables

<b>Variable</b>	<b>Std. Dev.</b>
<i>race</i>	0.37826
<i>gender</i>	0.484859
<i>PapersPublished</i>	1.791391
<i>Techlawprof</i>	0.217315
<i>TimesAcknowledged</i>	12.58001
<i>WhiteMen</i>	0.498858
<i>MenofColor</i>	0.2838
<i>WhiteWNS</i>	0.455238
<i>WNSofColor</i>	0.278385
<i>SchoolRank</i>	60.04687
<i>WeightedIndegree</i>	9.552699

**Table A3**  
Distribution of White Men Across School Rank

School Rank	White Men	White Men/Total	p-value
1-20	828	0.6044	2.87273e-37***
21-40	472	0.5419	2.39401e-02
41-60	345	0.5235	3.06122e-01
61-80	420	0.5371	1.17535e-01
81-100	345	0.5	6.77763e-06***
101-120	206	0.5323	3.00066e-01
121-140	280	0.5166	6.68445e-02
141-160	255	0.5324	2.96233e-01
161-180	394	0.4581	4.40094e-31***
181-200	225	0.5319	3.15006e-01

**Table A4**  
Distribution of Men of Color Across School Rank

School Rank	Men of Color	Men of Color/Total	p-value
1-20	111	0.081	7.27882e-02
21-40	79	0.0907	2.35229e-01
41-60	65	0.09863	1.33580e-03**
61-80	68	0.08696	3.97679e-01
81-100	62	0.08986	2.94507e-01
101-120	33	0.08527	3.37157e-01
121-140	38	0.07011	1.04804e-06***
141-160	35	0.07307	6.07248e-05***
161-180	98	0.11395	1.01041e-14***
181-200	35	0.08274	1.64887e-01

**Table A5**

Distribution of White Women & Nonbinary Scholars (WNS) Across School Rank

School Rank	White WNS	White WNS/Total	p-value
1-20	355	0.2591	8.08148e-13***
21-40	244	0.2801	9.98009e-04***
41-60	195	0.2959	3.43959e-01
61-80	236	0.3018	3.43959e-01
81-100	225	0.3261	1.27496e-06***
101-120	113	0.292	1.79331e-01
121-140	167	0.3081	9.28316e-02
141-160	154	0.3215	6.37137e-05***
161-180	249	0.2895	8.99354e-02
181-200	133	0.3144	6.47776e-03**

**Table A6**

Distribution of WNS of Color Across School Rank

School Rank	WNS of Color	WNS of Color/Total	p-value
1-20	76	0.0555	1.17509e-19***
21-40	76	0.0873	3.73604e-01
41-60	54	0.0819	1.78570e-01
61-80	58	0.0742	6.28647e-04***
81-100	58	0.0841	3.32467e-01
101-120	35	0.0904	1.71786e-01
121-140	57	0.1052	2.40554e-08***
141-160	35	0.0731	1.80447e-04***
161-180	119	0.1384	2.94252e-55***
181-200	30	0.0709	1.06797e-05***

**Regression 1**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{MenofColor}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \beta_4 \text{SchoolRank}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	10.672842	0.208509	51.187	<2e-16***
<b>MenofColor</b>	-0.207964	0.394569	-0.527	0.598
<b>WhiteWNS</b>	-1.430993	0.249925	-5.726	1.07e-08***
<b>WNSofColor</b>	-1.775026	0.402571	-4.409	1.05e-05***
<b>SchoolRank</b>	-0.044770	0.001813	-24.687	<2e-16***

**Regression 2**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{MenofColor}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \beta_4 \text{PapersPublished}_i \\ &+ \beta_5 \text{SchoolRank}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	7.484456	0.194363	38.508	<2e-16***
<b>MenofColor</b>	-0.660543	0.344692	-1.916	0.0554
<b>WhiteWNS</b>	-1.449120	0.218247	-6.640	3.37e-11***
<b>WNSofColor</b>	-1.690052	0.351549	-4.807	1.56e-06***
<b>PapersPublished</b>	2.490143	0.053107	46.889	<2e-16***
<b>SchoolRank</b>	-0.039313	0.001588	-24.758	<2e-16***



**Regression 3**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{MenofColor}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \beta_4 \text{PapersPublished}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	4.20837	0.14841	28.357	<2e-16***
<b>MenofColor</b>	-0.88188	0.35920	-2.455	0.0141*
<b>WhiteWNS</b>	-1.70714	0.22725	-7.512	6.54e-14***
<b>WNSofColor</b>	-2.24218	0.36573	-6.131	9.23e-10***
<b>PapersPublished</b>	2.58651	0.05521	46.847	<2e-16***

**Regression 4**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{MenofColor}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	7.0631	0.1549	45.591	<2e-16***
<b>MenofColor</b>	-0.4413	0.4111	-1.074	0.283
<b>WhiteWNS</b>	-1.7256	0.2602	-6.632	3.55e-11***
<b>WNSofColor</b>	-2.4110	0.4187	-5.758	8.86e-09***

**Regression 5**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{race}_i + \beta_2 \text{gender}_i + \beta_3 \text{PapersPublished}_i \\ &+ \beta_4 \text{SchoolRank}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	7.457328	0.191589	38.924	<2e-16***
<b>race</b>	-0.465702	0.252344	-1.846	0.065
<b>gender</b>	-1.371193	0.197005	-6.960	3.7e-12***
<b>PapersPublished</b>	2.489110	0.053091	46.884	<2e-16***
<b>SchoolRank</b>	-0.039305	0.001588	-24.754	<2e-16***

**Regression 6**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{WhiteMen}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \beta_4 \text{SchoolRank}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std._Error	t_value	Pr(> t )
<b>(Intercept)</b>	10.464879	0.397155	26.350	<2e-16 ***
<b>WhiteMen</b>	0.207964	0.394569	0.527	0.59816
<b>WhiteWNS</b>	-1.223029	0.416808	-2.934	0.00335 **
<b>WNSofColor</b>	-1.567062	0.522560	-2.999	0.00272 **
<b>SchoolRank</b>	-0.044770	0.001813	-24.687	<2e-16 ***

**Regression 7**

$$\begin{aligned} \text{WeightedIndegree}_i &= \beta_0 + \beta_1 \text{WhiteMen}_i + \beta_2 \text{WhiteWNS}_i \\ &+ \beta_3 \text{WNSofColor}_i + \epsilon_i \end{aligned}$$

Coefficients

	Estimate	Std.Error	t_value	Pr(> t )
<b>(Intercept)</b>	6.6218	0.3808	17.389	<2e-16***
<b>WhiteMen</b>	0.4413	0.4111	1.074	0.283069
<b>WhiteWNS</b>	-1.2843	0.4344	-2.956	0.003122**
<b>WNSofColor</b>	-1.9696	0.5444	-3.618	0.000299***