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Hierarchy, Race & Gender in Legal Scholarly Networks

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HIERARCHY, RACE & GENDER IN LEGAL SCHOLARLY NETWORKS

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

A potent myth of legal academic scholarship is that it is mostly meritocratic and that it is 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. Acknowledgements 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 impacts 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 is that legal scholarship is largely meritocratic and largely solitary.¹ Under such a view, what gets you ahead is simply a good idea:

¹ See, e.g., Meera E. Deo, *The Ugly Truth About Legal Academia*, 80 BROOK. L. REV. 943, 953 (2015) [hereinafter Deo, *Ugly Truth*]; 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”); Jonathan I. Tietz & W. Nicholson Price II, *Acknowledgments As a Window into Legal Academia*, 98 WASH. U. L. REV. 307, 312–14, 315–16 (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”).

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a head-turning paper that generates a whirlwind of citations and chatter with 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.² 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 acknowledgements 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. They 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 impact of hierarchy, race, and gender to see whether they show up in a quantitatively observable fashion. (Spoiler alert: they do.)

Here, we examine the star footnotes for nearly 30,000 law review articles published in generalist law journals over about a decade. We probe who acknowledges whom; how school rank matters; and what racial and gender-based disparities exist in who gets asked, or who gets credit (it's hard to tell) for feedback in scholarly papers. Not to hide the ball: we find that authors tend to acknowledge scholars from peer schools, most of all their own school, but also to typically acknowledge folks from somewhat fancier schools. We find that men are acknowledged more than women and nonbinary scholars,³ and white scholars more than scholars of color. We examine intersectional effects, which are complex; read on to find out more. One bright spot here: networks of scholars of color appear to be particularly robust.⁴

We also look to one sub-community to see whether patterns change. We examine the network of scholars working in the space of technology and intellectual property law ("tech/IP"), an unwieldy but meaningful classification,

² See generally, e.g., POWER, LEGAL EDUCATION, AND LAW SCHOOL CULTURES (Meera E. Deo, Mindie Lazarus-Black & Elizabeth Mertz, eds., 2020); DEO, UNEQUAL PROFESSION, *infra* note 22; 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, *Ugly Truth*, *infra* note 22, at 953.

³ 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 rather than excluding them.

⁴ See *infra* Fig. 12.

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as a specialist group that we might expect to interact meaningfully within itself (and with which we are most familiar). Surprisingly, nearly half of acknowledgements by tech/IP scholars are to scholars outside the field.⁵ 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.

These results cast more light on 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. Part I provides some scholarly background in the field. Part II presents our methods, drawing heavily on prior work by two of us (NP & JT).⁶ Part III gives our results; Part IV discusses them and gives 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 impacts 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.⁷ Everything is ranked to death. Privilege begets privilege—it's certainly not controversial to surmise that a connection to a fancy name brokers influence.⁸ Daniel Katz and colleagues took a network-oriented look (more on that later) at the legal academy—looking in particular at the influence of particular institutions.⁹ The result? An “extremely skewed distribution of social authority.”¹⁰ Certain schools

⁵ Whether boundary-crossing acknowledgements are testament to interdisciplinary boundary-crossing feedback or to widespread interests of tech/IP scholars must await future, more fine-grained work.

⁶ Tietz & Price 2020.

⁷ 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.*

⁸ Deo, *Ugly Truth*, *infra* note 22, 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”).

⁹ Katz et al., *infra* note 101.

¹⁰ Katz et al., *infra* note 101, at 78. And one “even more than is present in other intellectual disciplines.” *Id.*

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place graduates in law teaching positions at more prestigious schools (that is, in schools themselves more likely to have influence), and those graduates influence further graduates.¹¹ Katz et al., applying a computational model for information diffusion, showed further how the “structural position” of “historically elite institutions” “allows such schools to become intellectual super-spreaders.”¹² That skew, they argue, matters: to individuals, to institutions, and to the development of the law.¹³ In our view, Katz’s model suggests also 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.¹⁴ Some authors, too, craft their acknowledgment footnotes with prestige in mind.¹⁵ We also found that articles with more people thanked (perhaps signaling a larger academic circle) placed better.¹⁶ On hierarchy, it also turns out that higher-ranking law reviews tend to publish their own faculty more, regardless of article quality.¹⁷ Indeed, Minna Kotkin has observed that top journals “publish virtually no authors who do not teach at top 25 schools.”¹⁸ 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.”¹⁹ And if hierarchy affects other measures of success, it’s not a stretch that it would affect acceptance of legal scholarship too. What’s more, hierarchy stretches beyond institutional prestige: 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;²⁰ large white-shoe law firms are viewed as more prestigious than smaller firms; federal positions are often viewed with more

¹¹ Katz et al., *infra* note 101; see also Sarah Lawsky, *Lawsky Entry Level Hiring Report 2021*, PRAWFSBLAWG (May 18, 2021), <https://prawnsblawg.blogs.com/prawnsblawg/entry-level-hiring-report/> (showing data that over half of all reported entry-level law professor hires received their JD from seven schools, all in the top ten; one in six hires received their JD from Yale.).

¹² Katz et al., *infra* note 101, at 78–79, 96.

¹³ Katz et al., *infra* note 101, at 77–78, 81, 96.

¹⁴ Tietz & Price, *supra* note 76, at 333–34.

¹⁵ *Id.*

¹⁶ *Id.* at 324.

¹⁷ 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.

¹⁸ Kotkin, *infra* note 30, at 389.

¹⁹ Jewel, *supra* note 1, at 1175.

²⁰ See Jewel, *supra* note 1, 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 UL REV. 923 (HeinOnline 2020).

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acclaim than state ones; etc.

Next, race. As Meera Deo has noted, only 7 percent of law teachers are women of color, and 8 percent are men of color.²¹ In addition to being a small population, 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.²² 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.”²³ As Deo remarks, “volumes of research and personal narratives have also documented how the presumption of incompetence works against women of color faculty.”²⁴ To the extent that the professorial social structure differs for faculty of color in a way that affects scholarship, that matters: perceptions of scholarly success affect tenure, a key career inflection point.²⁵ Indeed, many have pointed to “the effect of racial difference on the distribution of scholarly influence and prestige in legal academia.”²⁶

Third, gender. Deo has documented particular gender-based challenges in

²¹ Deo, *Pandemic Effects*, *supra* note 22, at 2471; *see also* Meera E. Deo, *A Better Tenure Battle: Fighting Bias in Teaching Evaluations*, 31 COLUM. J. GENDER & L. 7, 12 tbl. 1 (2015) (presenting statistics by gender and race).

²² *See* Meera E. Deo, *Investigating Pandemic Effects on Legal Academia*, 89 Fordham L. Rev. 2467, 2468 & n.2 (2021) [hereinafter Deo, *Pandemic Effects*] (citing MEERA E. DEO, *UNEQUAL PROFESSION: RACE AND GENDER IN LEGAL ACADEMIA* 6 (2019) [hereinafter DEO, *UNEQUAL PROFESSION*]); *id.* at 2474 (citing Meera E. Deo, *The Ugly Truth About Legal Academia*, 80 BROOK. L. REV. 943, 980–84, 990–94 (2015) [hereinafter Deo, *Ugly Truth*]); *id.* at 2476 (“Many women of color are placed on committees because of their identities, regardless of their preferences or the repercussions.”).

²³ Deo, *Pandemic Effects*, *supra* note 22, at 2472 (quoting Meera E. Deo, *Looking Forward to Diversity in Legal Academia*, 29 BERKELEY J. GENDER L. & JUST. 352, 369 (2014)); *see also* Deo, *Ugly Truth*, *infra* note 22, at 964 (describing survey data on collegiality between colleagues, noting that white faculty view their relationships with colleagues in a more favorable light than faculty of color do).

²⁴ Deo, *Pandemic Effects*, *supra* note 22, at 2472–73 (citing PRESUMED INCOMPETENT (Gabriella Gutiérrez y Muhs et al. eds., 2012); PRESUMED INCOMPETENT II (Yolanda Flores Niemann et al. eds., 2020)).

²⁵ *See* Deo, *Pandemic Effects*, *supra* note 22, 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).

²⁶ 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).

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legal academia that shape the legal environment in which nonmale scholars work—including the prevalence of “silencing, mansplaining, and hepeating²⁷ 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.”²⁸ 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.²⁹ Kotkin has suggested that law-review editorial boards seem to exhibit at least some “unconscious bias with regard to gender and conscious bias with regard to privilege” in article selection.³⁰ 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.³¹ Kotkin’s work, examining statistics in publication in prestigious law reviews, probes several hypotheses about why gender disparities seem to exist.³² Women are also comparatively “over-represented in non-tenure eligible legal writing and clinical positions.”³³ Like scholars of color, women also face a higher burden of non-credited work.³⁴ 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.³⁵ To that end, she describes the nascent “Pandemic Effects on Legal Academia” project, or PELA, which investigates “scholarly productivity rates by race,

²⁷ “Hepeating” occurs “when a woman suggests an idea and it’s ignored, but then a guy says same thing and everyone loves it.” Nicole Gugliucci (@NoisyAstronomer), TWITTER (Sept. 22, 2017, 9:01 AM), <https://twitter.com/NoisyAstronomer/status/911213826527436800>.

²⁸ Deo, *Pandemic Effects*, *supra* note 22, at 2475 (discussing DEO, UNEQUAL PROFESSION, *supra* note 22); Deo, *Ugly Truth*, *infra* note 22, at 974–80 (cataloguing mansplaining).

²⁹ Tietz & Price, *supra* note 76, at 332–33.

³⁰ 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. REV. 385 (2010). Professor Kotkin caveats that her data set was unable to examine the gender breakdown of the potential author pool. *Id.* at 387.

³¹ Kotkin, *supra* note 30, at 392.

³² Kotkin, *supra* note 30.

³³ Kotkin, *supra* note 30, at 413; *see also* Jo Anne Durako, *Second-Class Citizens in the Pink Ghetto: Gender Bias in Legal Writing*, 50 JOURNAL OF LEGAL EDUCATION 562 (JSTOR 2000); Renee Nicole Allen et al., *The Pink Ghetto Pipeline: Challenges and Opportunities for Women in Legal Education*, 96 U. DET. MERCY L. REV. 525 (HeinOnline 2018).

³⁴ *E.g.*, Deo, *Pandemic Effects*, *supra* note 22, at 2477 (“Often, faculty who are men place these expectations squarely on the shoulders of their women colleagues.”); Deo, *Ugly Truth*, *infra* note 22, 990–93 (cataloguing how women, and especially women of color, tend to be overburdened by service).

³⁵ Deo, *Pandemic Effects*, *supra* note 22, at 2469, 2485–86 (discussing drops in publication submissions by women during the first year of the Covid-19 pandemic).

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gender, and raceXgender from 2019 to 2022.”³⁶ 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.³⁷

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.³⁸ There are of course those who insist there is no problem at all—that nonmale, nonwhite legal scholars have it just fine.³⁹ Especially so amid moral panics against such things as critical race theory—or even against the very idea of acknowledging systemic biases.⁴⁰ Critics have pointed, for example, to statistics showing that on a crude percentage basis, representation among legal academia has increased for historically underrepresented groups.⁴¹ Others suggest that it is meritocracy that results in

³⁶ Deo, *Pandemic Effects*, *supra* note 22, at 2468, 2470.

³⁷ 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 (1991–1992); Cheryl I. Harris, *Law Professors of Color and the Academy: Of Poets and Kings*, 68 CHI.-KENT L. REV. 331 (1992–1993); Katherine L. Vaughns, *Women of Color in Law Teaching: Shared Identities, Different Experiences*, 53 J. LEGAL EDUC. 496 (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 Symposium Essays*, 73 RUTGERS U.L. REV. 933 (2020–2021); Renee Nicole Allen, *Our Collective Work, Our Collective Strength Symposium Essays*, 73 RUTGERS U.L. REV. 881 (2020–2021); Priya Baskaran, *Service, Scholarship, and Radical Citation Practice Symposium Essays*, 73 RUTGERS U.L. REV. 891 (2020–2021); Kimberly Mutcherson, *Taking Our Space: Women of Color and Antiracism in Legal Academia Symposium Essays*, 73 RUTGERS U.L. REV. 869 (2020–2021); López, *supra* note 23; Meera E. Deo, *Unequal Profession, Unleashed Symposium Essays*, 73 RUTGERS U.L. REV. 857 (2020–2021).

³⁸ See Deo, *Ugly Truth*, *infra* note 22 (presenting survey results of faculty perceptions differing by demographics).

³⁹ 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 (2015) (fretting over “the innocent man searching for his own toe hold” among measures designed to improve equity); see also Darren Lenard Hutchinson, *Who Locked Us Up? Examining the Social Meaning of Black Punitiveness*, 127 YALE L.J. 2388, 2414 & n.155 (2018) (collecting various works by previous author along the same theme and observing Subotnik’s skepticism of “the ongoing relevance of race and sex discrimination”).

⁴⁰ Cf. Deo, *Pandemic Effects*, *supra* note 22, at 2489–90 (discussing “climate of fear” surrounding racial violence and hate crimes in recent years).

⁴¹ E.g., Subotnik, *supra* note 39.

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observed gender disparities.⁴²

Such criticisms are often half-hearted and typically half-baked. Others before us have cast doubt on them. 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.⁴³ We here 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

⁴² Minna Kotkin, *supra* note 30, describes 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. *Id.* 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.

⁴³ 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 W. 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); Taled 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*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3930158 (2021); Roy L. Brooks, *Life After Tenure: Can Minority Law Professors Avoid the Clyde Ferguson Syndrome?*, 20 U.S.F. L. REV. 419 (1985); Pamela J. Smith, *The Tyrannies of Silence of the Untenured Professors of Color*, 33 U.C. DAVIS L. REV. 1105 (1999).

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 et al., *supra* note 37; Durako, *supra* note 37; Christopher A. Cotropia & Lee Petherbridge, *Gender Disparity in Law Review Citation Rates*, 59 WM. & MARY L. REV. 771 (2017); Christopher J. Ryan & 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 Blaugosphere*, 41 HARV. WOMEN’S L.J. 239 (2018); Jennifer C. Mullins & Nancy Leong, *The Persistent Gender Disparity in Student Note Publication*, 23 YALE J.L. & FEMINISM 385 (2011); Lorenzo Ductor, Sanjeev Goyal & Anja Prummer, *Gender and Collaboration*, REV. OF ECON. & STATISTICS (2021).

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 Revisiting Langdell: Legal Education Reform and the Lawyer’s Craft*, 51 WAKE FOREST L. REV. 339 (2016); Katz et al., *infra* note 101.

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meritocracies (or other like delusions). But this background led us to be 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.”⁴⁴ It’s weird for a number of structural reasons: no 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.⁴⁵ Another relatively unique feature of the canonical law-review article is the biographical footnote.⁴⁶

It’s not that other fields don’t include biographical details of their authors generally, or that they don’t include acknowledgments. Many do. But few disciplines give the biographical footnote its own little front-and-center role—a sort of opener to the paper’s main act. There are exceptions, of course. And sometimes the biographical footnote is omitted entirely. 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. It can be long—a full paragraph. It can include a bevy of names: of people, of institutions.⁴⁷ It can explain the role of various non-authors in the

⁴⁴ Tietz & Price, *infra* note 76, at 309 n.1 & accompanying text.

⁴⁵ See Tietz & Price, *infra* note 76, at 309; Lori McPherson, *Law Review Articles Have Too Many Footnotes*, 68 J. Legal Educ. 457, 457–58 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)). For consternation, see, for instance, Will Wilkinson (@willwilkinson), TWITTER (June 9, 2021, 10:47 AM), <https://twitter.com/willwilkinson/status/1402638379846717447> (“Half of them are mostly footnotes, which are usually more interesting than the text, which repeats the same thing over and over in slightly different terms for 90 pages.”).

⁴⁶ 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 (2005).

⁴⁷ 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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article production process. It can include jokes or asides. The biographical footnote, indeed, can occupy most of a page in its own right⁴⁸ and might include some discursive text of its own.⁴⁹

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⁴⁸ The longest we identified listed scores of names—but interestingly, all of them were personal thanks, not those of scholars. See Tietz & Price, *infra* note 76, 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)).

⁴⁹ For a biographical footnote occupying more than a page, and including a handful of distinct discursive paragraphs and a blockquote, see Jonathan K. Van Patten, *The Trial and Incarceration of Andy Dufresne*, 62 S.D. L. REV. 49, 49–50 n.† (2017) (designating article to memory of friend).

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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. Granted, looking at footnotes still has limitations: network pictures might be incomplete due to frequent failures to credit members of certain groups for their contributions, for instance.⁵⁰ But it certainly paints a richer and fuller picture than citations alone. Two of us (NP & JT—for the rest of Part II.C, “we”) found this all intriguing and previously looked both at the content of biographical footnotes as well as what authors and editors tended to do with them. 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.⁵¹ 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.⁵² We then extracted the text of the biographical footnote from each.⁵³

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

⁵⁰ See, e.g., Jana Bacevic, *Epistemic Injustice and Epistemic Positioning: Towards an Intersectional Political Economy*, SOCARXIV (July 20, 2021) at 9–10, <https://osf.io/preprints/socarxiv/pzsf8> (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 10. And as Professor Bacevic observes, attribution “has direct consequences for employment and promotion”—that is, “who gets cited and credited has consequences.” *Id.* at 9–10.

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: *misappropriation*. See *id.* at 10–13 (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).

⁵¹ Tietz & Price, *infra* note 76, at 310–11, 321. Specifically, 183 law reviews from 2008 to 2017. See *id.* at 321.

⁵² *Id.* at 321.

⁵³ *Id.* at 321.

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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.⁵⁴ We found that acknowledgment footnotes tend to be longer for higher-ranked journals—about twice as long for the top-10-ranked than for the median.⁵⁵ This neatly paralleled an increase in the number of people thanked in each. The top handful of journals averaged about 15 people in the biographical footnote—the median journal about 3 or 4.⁵⁶ The higher-placed articles also tended to more often feature certain words reflecting the scholarly communities and opportunities of those authors: e.g., “workshop,” “conference,” and “roundtable.”⁵⁷ The disparities were sharper for some terms than others—“workshop” increased dramatically in the top journals, “research” and “feedback” increased gradually, and things like “support” or “students” or “editors” were relatively flat.⁵⁸ On top of that, thanks generally went heavily to men.⁵⁹ There’s more, but suffice it to say that our results suggested something different about top-placed papers (and their authors) than others.

We wanted a broader picture too. So we sent a survey out by email and social media—asking authors and editors about their experiences.⁶⁰ 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 used with editors in mind.⁶¹ We asked editors about their article selection process, perceived usefulness of footnotes, and information about their journal.⁶² It was an informal look, and one of convenience.⁶³ 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, and usually for having some productive role in the article-

⁵⁴ *See id.* at 321.

⁵⁵ *Id.* at 323.

⁵⁶ *Id.* at 324.

⁵⁷ *Id.* at 324–25.

⁵⁸ *Id.* at 324–28; *see also id.* at 329–30.

⁵⁹ *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 generally* Bacevic, *supra* note 50, 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).

⁶⁰ *Id.* at 323.

⁶¹ *See id.* at 350–51.

⁶² *See id.* at 350–51.

⁶³ *Id.* at 323.

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creation process (even if at some level of attenuation).⁶⁴ Editors understood this function of footnotes—signaling coproduction—as they tended to understand that inclusion of a name meant that that person was somehow connected to the piece.⁶⁵ Some authors reported using their biographical footnotes to signal their scholarly network (and even considering this when deciding who to ask for feedback on papers).⁶⁶ Or to signal credibility—both as to fanciness and to authority for interdisciplinary articles.⁶⁷ Other indicia of co-production were common too: noting the help of research assistants, participation in conferences, and the like.⁶⁸

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 be employed in the effort to filter out the flood of articles that come in during submission season.⁶⁹ A lack of acknowledged commenters could be a red flag, for instance.⁷⁰ Noting a conference or workshop might signify that a paper had been at least somewhat refined by peers.⁷¹ Some editors and authors were conscious of the potential gamesmanship involved.⁷² It hadn’t occurred to others.⁷³

In all, this first look supported some hunches we had—that knowledge coproduction is more common in legal scholarship than the lone-author tradition would suggest, and that there are functional substitutes for peer review in operation.⁷⁴ 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 of numerous scholars with an article to symbolize vetting and estimate that the article is better than it would be otherwise.⁷⁵ Under either mechanism, an author’s social network matters.

C. Social network analysis and academia

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

⁶⁴ *Id.* at 330.

⁶⁵ *E.g., id.* at 330–31.

⁶⁶ *E.g., id.* at 333.

⁶⁷ *Id.* at 334.

⁶⁸ *Id.* at 331.

⁶⁹ *E.g., id.* at 335–36, 343.

⁷⁰ *Id.* at 336.

⁷¹ *Id.* at 337.

⁷² *E.g., id.* at 335, 339.

⁷³ *Id.* at 335, 338 & n.113.

⁷⁴ *See id.* at 330–40.

⁷⁵ *See id.* at 340–41.

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previously plumbed acknowledgment footnotes in legal academia.⁷⁶ That work was statistical, peering into the prevalence of certain properties or phrases among highly ranked law review articles.⁷⁷ Some familiarity among the three of us with network analysis⁷⁸ led to an interest in expanding the data set to inquire into the network properties of acknowledgments: what's 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 a certain way.⁷⁹ A particular “node” (e.g., a legal scholar) might have a connection with any number of other nodes in the network—connections referred to as “edges.”⁸⁰ In any given network, the presence of an edge (again, that's just a link) between any two nodes means that the two share some specific kind of tie, such as co-authoring a paper, being on the same faculty, being friends, citing to each other, or the like.⁸¹ 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?⁸² Are some people more connected than others? Do certain placements within a network correlate to greater acclaim?⁸³ What's more, 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 difference affect the nodes in those communities. And comparison of networks over time allows longitudinal insight into how a

⁷⁶ Jonathan I. Tietz & W. Nicholson Price II, *Acknowledgments As a Window into Legal Academia*, 98 WASH. U. L. REV. 307 (2020); see also Bryan L. Frye, *Nicholson Price and Jonathan Tietz on Vanity Footnotes*, in IPSE DIXIT (Apr. 15, 2020), <https://shows.acast.com/ipse-dixit/episodes/nicholson-price-and-jonathan-tietz-on-vanity-footnotes>.

⁷⁷ Tietz & Price, *supra* note 76, at 323–35.

⁷⁸ 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 NAT. CHEM. BIO. 470 (2017).

⁷⁹ E.g., Newman, *Collaboration Networks*, *infra* note 89, at 404; Uddin et al., *Trend and Efficiency*, *infra* note 84, at 688; Edelman & George, *infra* note 117, at 22–24; Ryan Whalen, *Legal Networks: The Promises and Challenge of Legal Network Analysis*, 2016 MICH. ST. L. REV. 539, 540–54.

⁸⁰ See, e.g., Katz et al., *infra* note 101, at 81.

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

⁸² See, e.g., Hayashi, *infra* note 118, at 6–7.

⁸³ 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 (2012) [hereinafter Abbasi et al., *Egocentric Analysis*].

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social structure evolves.⁸⁴

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.⁸⁵ For instance: Are more connected people also more frequently cited?⁸⁶ Do certain people control entry into or success within a community?

Just as the invention of hammers doubtless heralded quick innovation in nails, the advent of easily computerized network-analysis methods saw quick deployment in any number of fields.⁸⁷ This predictably (if navel-gazingly⁸⁸) included the study of, well, studies. And so a recent interdisciplinary body of literature addresses social network analysis in the context of academia.⁸⁹

⁸⁴ See, e.g., Hayashi, *infra* note 118, at 13 (comparing legal-scholar co-authorship subnetworks by decade); Abbasi et al., *Betweenness Centrality*, *supra* note 89, at 407–09 (examining network structure with respect to new entrants into a collaboration network compared with a previous year); Shahadat Uddin, Liaquat Hossain, Alireza Abbasi & Kim Rasmussen, *Trend and Efficiency Analysis of Co-authorship Network*, 90 SCIENTOMETRICS 687 (2012) [hereinafter Uddin et al., *Trend and Efficiency*] (conducting 20-year longitudinal network study of co-authorship network).

⁸⁵ See, e.g., Hayashi, *infra* note 118, at 7 (annotating author nodes with race, gender, and sexual-orientation demographic data).

⁸⁶ Abbasi et al., *Egocentric Analysis*, *supra* note 83.

⁸⁷ See Edelman & George, *infra* note 117, at 23; Whalen, *supra* note 79, at 546.

⁸⁸ See Edelman & George, *infra* note 117, at 23 (acknowledging “the inherent interest of academics in studies of their own behavior”).

⁸⁹ E.g., Abbasi et al., *Egocentric Analysis*, *supra* note 83; 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, 403–04 (2012) [hereinafter Abbasi et al., *Betweenness Centrality*] (reviewing literature); Uddin et al., *Trend and Efficiency*, *supra* note 84; M.E.J. Newman, *Coauthorship Networks and Patterns of Scientific Collaboration*, 101 PROC. NAT’L ACAD. SCI. (SUPPL. 1) 5200 (2004) [hereinafter Newman, *Coauthorship Networks*]; M.E.J. Newman, *The Structure of Scientific Collaboration Networks*, 98 PROC. NAT’L ACAD. SCI. 404 (2001) [hereinafter Newman, *Collaboration Networks*]; 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 (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. STUDIES 957 (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 (2002); James Moody, *The*

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A few key insights from this literature bear mentioning. First, it seems that research productivity/citations and network placement are connected.⁹⁰ Scholars with more co-authors and more network centrality tend to be cited more.⁹¹ Network location also affects the access of a scholar to new entrants and new collaborators; in the physical sciences, for instance, new entrants tend to connect with the already well connected.⁹² 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.⁹³ It also seems that certain scholars effectively can serve as gatekeepers (or “brokers”), facilitating access to other scholars in a way.⁹⁴ And the effects of network position can be different for newer scholars than for those who are more established.⁹⁵ 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.⁹⁶

To the extent network analysis has been used in law, it's mostly been in the context of legal documents or provisions—for instance, citation networks of

Structure of a Social Science Collaboration Network: Disciplinary Cohesion from 1963 to 1999, 69 AM. SOCIOLOGICAL REV. 213 (2004).

⁹⁰ E.g., Abbasi et al., *Betweenness Centrality*, *supra* note 89, at 406.

⁹¹ Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 671, 677; *see also* Alireza Abbasi, Jörn Altmann, Liaquat Hossain, *Identifying the Effects of Co-authorship Networks on the Performance of Scholars: A Correlation and Regression Analysis of Performance Measures and Social Network Analysis Measures*, 5 J. INFORMETRICS 594, 594 (2011) [hereinafter Abbasi et al., *Effects of Co-authorship*].

⁹² *See* Abbasi et al., *Betweenness Centrality*, *supra* note 89, at 403 (examining “betweenness centrality” as a “predictor of preferential attachment by new entrants”). As Abbasi and coworkers explain, “the rich get richer.” *Id.* at 405.

⁹³ Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 677. Abbasi and coworkers 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.*

⁹⁴ E.g., Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 673–74 (reviewing “structural holes theory”); Abbasi et al., *Betweenness Centrality*, *supra* note 89, at 407.

⁹⁵ *See, e.g.*, Vanash M. Patel, Peitro 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. MED. 245 (2019) (“While junior researchers amplified success when brokering among otherwise disconnected collaborators, senior researchers prospered from socially cohesive networks, rich in third-party relationships.”).

⁹⁶ Tietz & Price, *supra* note 76, at 315–16.

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patents,⁹⁷ case law,⁹⁸ and codes, statutes, and regulations.⁹⁹ A few have looked at scholarship, but those looks have been work-centric rather than author-centric—as with Oren Perez, Judit Bar-Ilan, Rueven Cohen, and Nir Schreiber’s look into the network of citations between papers themselves.¹⁰⁰ On the social front, Daniel Katz, Joshua Gubler, Jon Zelner, Michael Bommarito, 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.¹⁰¹ So has Andrew Hayashi, using co-authorship between individual authors as connections (more on that later).¹⁰² Heinz and Laumann examined the social structure of the Chicago-area bar.¹⁰³ And Daniel Katz and Derek Stafford have looked at a social network of the American federal judiciary on the basis of shared clerks.¹⁰⁴

Most social network analysis of scholarship focuses on co-authorship. Why? A superficial explanation: it’s the easiest connection to measure.¹⁰⁵ Another

⁹⁷ Jure Leskovec, *SNAP Patent Citation Network*, STANFORD, <https://snap.stanford.edu/data/cit-Patents.html>; Whalen, *supra* note 79, at 550 (reviewing examples).

⁹⁸ *E.g.*, Thomas A. Smith, *The Web of Law*, 44 SAN DIEGO L. REV. 309 (2007) (conducting 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 (2019) (analyzing network of Supreme Court cases); Whalen, *supra* note 79, at 548–50 (reviewing examples).

⁹⁹ *E.g.*, Michael J. Bommarito & Daniel M. Katz, *A Mathematical Approach to the Study of the United States Code*, 389 *Physica A* 4195 (2010); Whalen, *supra* note 79, at 551–52.

¹⁰⁰ Oren Perez, Judit Bar-Ilan, Reuvan Cohen & Nir Schreiber, *The Network of Law Reviews: Citation Cartels, Scientific Communities, and Journal Rankings*, 82 MODERN L. REV. 240 (2019).

¹⁰¹ 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 (2011).

¹⁰² Hayashi, *infra* note 118.

¹⁰³ JOHN P. HEINZ & EDWARD O. LAUMANN, *CHICAGO LAWYERS: THE SOCIAL STRUCTURE OF THE BAR* (1982).

¹⁰⁴ Daniel M. Katz & Derek K. Stafford, *Hustle and Flow: A Social Network Analysis of the American Federal Judiciary*, 71 OHIO ST. L.J. 457 (2010).

¹⁰⁵ Abbasi et al., *Betweenness Centrality*, *supra* note 89, 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.” (cleaned up)); Acedo et al., *supra* note 89, 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*:

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explanation is that outside of law, co-authorship is exceptionally common and reflects patterns of knowledge co-production (at least, reflects it *enough*).¹⁰⁶ Authorship credit in the sciences, for instance, tends to be inclusive¹⁰⁷: it's not uncommon for a paper to include professors, postdocs, graduate students, laboratory technicians, and undergraduates.¹⁰⁸ 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,¹⁰⁹ and citations provide an incomplete picture too.¹¹⁰ 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 co-authorship in legal scholarship, if relatively little *network* work. James Farrell and Russell Smyth, for instance, examined Australian law reviews.¹¹¹ Although this wasn't a network analysis, they did note disproportionate representation of men among co-authored

Coauthorship and Subauthorship Collaboration in the 20th Century as Manifested in the Scholarly Journal Literature of Psychology and Philosophy, 54 J. AM. SOC. FOR INFO. SCI. & TECH. 855 (2003) [hereinafter Cronin et al., *A Cast of Thousands*]).

¹⁰⁶ See, e.g., Mark E. J. Newman, *Coauthorship Networks and Patterns of Scientific Collaboration*, 101 PROC. NAT. ACAD. SCI. suppl. 1 5200, 5200 (2004) (“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., *Cast of Thousands*, *supra* note 105.

¹⁰⁷ “Inclusive” in the sense of what tasks merit authorship. Whether scientific authorship is inclusive in terms of hierarchy, race, and gender is another question.

¹⁰⁸ 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).

¹⁰⁹ Newman, *Coauthorship Networks*, *supra* note 106, at 5204 (citing Derek J. de Solla Price, *Networks of Scientific Papers*, 149 SCIENCE 510 (1965)).

¹¹⁰ E.g., Giles & Council, *infra* note 140, at 17599 (“[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.”).

¹¹¹ James Farrell & Russell Smyth, *Trends in Co-authorship in the Australian Group of Eight Law Reviews*, 39 MONASH U. L. REV. 813 (2013).

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articles, as well as a disproportionate share of high-ranked institutions.¹¹² Tom Ginsburg and Thomas Miles have also noted an increase in legal-scholarship co-authorship, attributing this largely to a rise in empirical legal studies.¹¹³ Tracey George and Chris Guthrie looked generally at the role of collaboration in the development of legal thought, examining co-authorship trends in law reviews.¹¹⁴ They observe that “lengthy 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.”¹¹⁵ Two of us (JT & NP) previously looked at co-authorship in law reviews, finding that highly regarded articles tended to be co-authored more frequently than the baseline rate.¹¹⁶ Paul Edelman and Tracey George performed a network analysis of legal scholars by co-authorship to probe connectivity—concluding that Cass Sunstein is the Paul Erdős of law (and explaining that Paul Erdős is the Kevin Bacon of math).¹¹⁷ But probably the most pertinent look has been by Andrew Hayashi, who *did* conduct a network analysis.¹¹⁸ 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 seventy thousand articles and nearly ten thousand repeat-player authors.¹¹⁹ He matched this data with self-reported demographic information from AALS—namely, gender, minority status, institutional affiliation, and age.¹²⁰ From that set he constructed a social network, with professors as the nodes and edges signifying article co-authorship.¹²¹

¹¹² Farrell & Smyth, *supra* note 111, at 824–27.

¹¹³ Ginsburg & Miles, *infra* note 123; *see also* Tracey E. George, *An Empirical Study of Empirical Legal Scholarship: The Top Law Schools*, 81 IND. L.J. 141, 150 (2006) (noting a growth in empirical legal scholarship and concomitant “trend toward increased collaboration”).

¹¹⁴ 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).

¹¹⁵ George & Guthrie, *supra* note 114, at 560.

¹¹⁶ Tietz & Price, *supra* note 76, at 334–35.

¹¹⁷ Paul H. Edelman & Tracey E. George, *Six Degrees of Cass Sunstein: Collaboration Networks in Legal Scholarship*, 11 GREEN BAG 2D 19 (2007).

¹¹⁸ Andrew Hayashi, *The Evolving Network of Legal Scholars*, SSRN (Virginia Public Law and Legal Theory Research Paper No. 2021-25, Apr. 26, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3833993.

¹¹⁹ Hayashi, *supra* note 118, at 7. To be specific, Hayashi took the top 100 general and specialty student-edited law journals as ranked by Washington and Lee. *Id.* Of these, he filtered out certain works—namely, works without a professor author.

¹²⁰ Hayashi, *supra* note 118, at 7. Like us, *see* Tietz & Price, *supra* note 1, at 322, Hayashi inferred gender from Social Security statistical data if an author’s gender wasn’t reported in the AALS directory.

¹²¹ Hayashi, *supra* note 118, at 7–8.

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Hayashi’s data set spans decades, allowing not only broad-scale network analysis but also a longitudinal view.¹²² This is to our knowledge the most thorough empirical glimpse into the legal scholarship network yet—and a fascinating one. First, co-authorship is increasing substantially: five percent of articles in the early 1980s to more than fifteen percent by 2019.¹²³ This upward trend includes increased co-authorship across institutions.¹²⁴ Second, co-authorship trends are not consistent with co-authorship relationship arising randomly.¹²⁵ And third, the legal-scholar network has so-called small-world properties.¹²⁶ Intriguingly, it is not only the percent of co-authorship that has increased—so has connectedness. Yet, found Hayashi, co-authoring remains cliquish.¹²⁷ The largest connected subnetwork of the dataset in 1980 (that is, the biggest “island”) entailed about three percent of the network; in the 2010s, it was more than half.¹²⁸ But this overall connectivity boost doesn’t seem to be from increasing collaboration writ large; as we understand Hayashi’s findings, it’s the result of cross-over between cliques spurred by certain frequently co-authoring scholars, not broad connectedness among scholars in general.¹²⁹ Some scholars co-author a lot, and some never.¹³⁰ And the distribution of each doesn’t reflect random chance.¹³¹ What’s more, the overall amount of “clustering” in the network is several hundred times higher than would be expected by chance.¹³² And many scholars, Hayashi points out, are only loosely connected.¹³³

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. Co-authorship, of course, is a somewhat

¹²² *E.g.*, Hayashi, *supra* note 118, at 13.

¹²³ Hayashi, *supra* note 118, at 8–9. This is consistent with what Miles and Ginsburg found among the top fifteen law reviews from 2000 and 2010. Tom Ginsburg & Thomas J. Miles, *Empiricism and the Rising Incidence of Coauthorship in Law*, 2011 U. ILL. L. REV. 1785.

¹²⁴ Hayashi, *supra* note 118, at 17–18.

¹²⁵ Hayashi, *supra* note 118, at 8.

¹²⁶ Hayashi, *supra* note 118, at 8, 16–18. As Hayashi explains, a “small world” network is one in which (1) the number of scholars is much larger than the number of co-authors, (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 16.

¹²⁷ Hayashi, *supra* note 118, at 13.

¹²⁸ Hayashi, *supra* note 118, at 10.

¹²⁹ *See* Hayashi, *supra* note 118, at 13.

¹³⁰ Hayashi, *supra* note 118, at 14–16, 23.

¹³¹ Hayashi, *supra* note 118, at 14–16, 23.

¹³² Hayashi, *supra* note 118, at 17.

¹³³ Hayashi, *supra* note 118, at 14.

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stringent measure of social connectedness.¹³⁴ It's a strong measure,¹³⁵ but it leaves a lot out, especially in disciplines without a generous co-authorship tradition.¹³⁶ There are many forms of what might be called “knowledge co-production,”¹³⁷ “subauthorship collaboration,”¹³⁸ “intellectual collaboration,”¹³⁹ or the like. Many authors who heavily influence each others' works will never share an article. And so it might be that the legal professoriate is far less cliquy than the co-authorship 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,¹⁴⁰ and we've made the case previously.¹⁴¹ Some network-based work has been done on acknowledgments—but to our knowledge, not in legal academia, and not nearly to the extent that co-authorship has been

¹³⁴ Newman, *Collaboration Networks*, *supra* note 89, at 405 (acknowledging stringency); *id.* at 404–05 (“[M]ost people who have written a paper together will know one another quite well.”).

¹³⁵ See Uddin et al., *Trend and Efficiency*, *supra* note 84, at 688 (“[C]o-authorship implies a much stronger bond among authors than citation.”).

¹³⁶ Cf. David N. Laband & Robert D. Tollison, *Intellectual Collaboration*, 108 J. POLITICAL ECON. 632, 32 (2000) (noting that collaboration includes not just co-authorship but many other informal mechanisms, and further arguing that “[w]hile the incidence and extent of formal coauthorship are greater in biology than in economics, the extent of intellectual collaboration is greater in economics than in biology”).

¹³⁷ Tietz & Price, *supra* note 76.

¹³⁸ Cronin et al., *supra* note 105.

¹³⁹ Laband & Tollison, *supra* note 136.

¹⁴⁰ *E.g.*, Cronin et al., *supra* note 105 (comparing acknowledgment practices by discipline and noting that “the acknowledgment . . . provides a revealing insight into the nature and extent of subauthorship collaboration”); Blaise Cronin, Debora Shaw & Kathryn La Barre, *Visible, Less Visible, and Invisible Work: Patterns of Collaboration in 20th Century Chemistry*, 55 J. AM. SOC. FOR INFO. SCI. & TECH. 160 (2004) (similar); BLAISE CRONIN, *THE SCHOLAR'S COURTESY: THE ROLE OF ACKNOWLEDGEMENT 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.”); C. Lee Giles & Isaac G. Council, *Who Gets Acknowledged: Measuring Scientific Contributions Through Automatic Acknowledgment Indexing*, 101 PROC. NAT'L ACAD. SCI. 17599 (2004) (“[W]e argue that acknowledgments can be considered as a metric parallel to citations in the academic audit process.”).

¹⁴¹ Tietz & Price, *supra* note 76.

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scrutinized.¹⁴²

* * *

The scholarship in this area tends to be both utilitarian and institutional in its interest. The questions tend to be practical: How do we get the most research bang for our taxpayer buck?¹⁴³ How do we maximize productivity?¹⁴⁴ How do we foster collaboration?¹⁴⁵ Does collaboration affect impact?¹⁴⁶ How do ideas flow?¹⁴⁷ Which institutions are most influential?¹⁴⁸ Can we predict future performance?¹⁴⁹ Are our researchers being efficient?¹⁵⁰

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

Not entirely neglected, though. Andrew Hayashi recently took a look at the co-authorship network of the law professoriate with a particular eye toward the status of female, minority, and LGB scholars.¹⁵¹ (This was the study we discussed already above along other lines.) The share of known LGB scholars has increased since the 1980s.¹⁵² But the rate of increase is slowing for minority scholars and is quite modest for those who are LGB.¹⁵³ Hayashi was interested into where these scholars were situated within the broader network. So-called mixed co-authorship (one author within these groups and one not) has indeed increased.¹⁵⁴ But, clarifies Hayashi, that number alone doesn't mean that race,

¹⁴² *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 (2012). [N.B. this is a very strange citation format—not sure if book or journal article.]

¹⁴³ *E.g.*, Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 672 (framing analysis in terms of governmental interest in “creation of new scientific knowledge” and “increasing the visibility and authorship of . . . highly productive researchers”).

¹⁴⁴ *E.g.*, Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 672.

¹⁴⁵ *E.g.*, Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 672.

¹⁴⁶ *E.g.*, Acedo et al., *supra* note 89, at 958.

¹⁴⁷ *See, e.g.*, Katz et al., *infra* note 101, at 81.

¹⁴⁸ *See, e.g.*, Katz et al., *infra* note 101, at 81.

¹⁴⁹ *E.g.*, Abbasi et al., *Effects of Co-authorship*, *supra* note 91.

¹⁵⁰ *See* Giles & Council, *supra* note 140.

¹⁵¹ Hayashi, *supra* note 118.

¹⁵² Hayashi, *supra* note 118, at 18. Minority scholars went from 4.7% in the 1980s to 11.7% in the 2010s; for women, 17.0% to 34.5%; for LGB scholars, 1.8% to 3.9%. *Id.*

¹⁵³ Hayashi, *supra* note 118, at 18.

¹⁵⁴ Hayashi, *supra* note 118, at 19–20.

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gender, and sexual orientation don't affect co-authorship relationships.¹⁵⁵ To determine if these statuses were assortative, he probed homophily—that is, the “differential probability for links to form between nodes with the same attributes.”¹⁵⁶ The result: for every decade and demographic category, a positive homophily coefficient, reflecting assortative co-authorship, though decreasing over time.¹⁵⁷ 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 that network structure matters.¹⁵⁸ It matters in terms of individual influence and opportunity—both in terms of the population a professor teaches (students who may become practitioner, judges, and academics) as well as the ability of her ideas to spread.¹⁵⁹ It's not immediately clear that there's an ideal network structure: is a cliquy hub-and-spoke topology better, or is a widely dispersed network?¹⁶⁰ 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.

* * *

We build here most closely in part on our previous work and in part on Hayashi's (and of course: on the work of scores of nonmale, nonwhite scholars who've been given the burden of starting and sustaining the conversation in the legal academy on hierarchy, race, and gender¹⁶¹—many of whom have never received any credit for the work they do¹⁶²). To that end, a few background observations established in the literature are important: productivity, citation

¹⁵⁵ Hayashi, *supra* note 118, at 20.

¹⁵⁶ Hayashi, *supra* note 118, at 20.

¹⁵⁷ Hayashi, *supra* note 118, at 21.

¹⁵⁸ Katz et al., *infra* note 101.

¹⁵⁹ See, e.g., Katz et al., *infra* note 101, at 96 (applying computational information-flow model to institutional network); *id.* at 100–01; Newman, *Collaboration Networks*, *supra* note 89, at 404 (explaining that the “structure [of social networks] has important implications for the spread of information”).

¹⁶⁰ See Abbasi et al., *Egocentric Analysis*, *supra* note 83, at 673 (noting differences in networks in terms of extent of decentralization); Abbasi et al., *Effects of Co-authorship*, *supra* note 91, at 596–97 (exploring theoretical implications of differences in network structures for scholarly performance).

¹⁶¹ See *supra* notes 7–43 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 76, at 344 n.128 (collecting sources).

¹⁶² 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 76, at 333–34.

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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: acknowledgements are an imperfect way to examine knowledge co-production. When we see an acknowledgement 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.¹⁶³ The inverse is not 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.¹⁶⁴ We can thus limn some likely outlines of relationships and knowledge production in the legal academy through acknowledgements, but have less clarity about what lives in the unacknowledged spaces.

III. BASIC METHODOLOGY

We will just briefly review our methods here. Because we built directly on the data used in JT and NP's prior footnote piece 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 that we did in our prior footnote piece. Accordingly:¹⁶⁵

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

¹⁶³ 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.

¹⁶⁴ See *supra* notes 50, 59 and accompanying text.

¹⁶⁵ 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.

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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.¹⁶⁶

We note that 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, which limited our ability to look at scholarly relationships involving legal writing professors.¹⁶⁷ Nor did we examine journals that specialize, which limited our ability to look at the same in interdisciplinary contexts. A broader scope would be useful in future use, 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 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).¹⁶⁸

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 Association of American

¹⁶⁶ Tietz & Price, *supra* note 1, at 321 (footnote omitted). For more detail, see that article.

¹⁶⁷ See, e.g., Rachel Lopez, *Unentitled: The Power of Designation in the Legal Academy*, 73 RUTGERS L. REV. 923 (2021); Jo Anne Durako, *Dismantling Hierarchies: Occupational Segregation of Legal Writing Faculty in Law Schools: Separate and Unequal*, 73 UMKC L. REV. 253 (2004). In a notable exception to the general trend among law reviews, legal writing journals are typically peer reviewed.

¹⁶⁸ Tietz & Price, *supra* note 1, at 322 (footnote omitted).

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Law Schools (AALS) list of law professors to identify only law professor authors of the articles in our dataset.¹⁶⁹ 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).¹⁷⁰

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 because researchers are often more concerned with getting a large data set than with accuracy.¹⁷¹ Given the large size of our database, we prioritized accuracy over quantity. Therefore, we matched 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 to match nicknames.¹⁷² 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 the US News and World reports for 2012–2016 and used the average for the five years.¹⁷³ We assigned a rank of 151 to schools listed as “Tier 2” and 200 for schools listed as “unranked.” The University of Irvine Law School was only ranked starting in 2015, so we averaged the two available years.

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

¹⁶⁹ E.g., ASS’N AM. L. SCH., THE AALS DIRECTORY OF LAW TEACHERS (2015–2016 ED. 2015).

¹⁷⁰ Tietz & Price, *supra* note 1, at 322.

¹⁷¹ Martha Bailey, Connor Cole, Morgan Henderson & Catherine Massey, *How Well Do Automated Linking Methods Perform? Lessons from U.S. Historical Data*, NBER (Working Paper No. 24019, rev. May 2019) <https://www.nber.org/papers/w24019>.

¹⁷² @carltonnorthern, *nickname-and-diminutive-names-lookup*, GITHUB, <https://github.com/carltonnorthern/nickname-and-diminutive-names-lookup>.

¹⁷³ USNWR rankings are concededly problematic and flawed; nevertheless, they are widely used and highly influential. See, e.g., Stephanie C. Emens, *The Methodology & Manipulation of the U.S. News Law School Rankings*, 34 J. LEGAL PROF. 197 (2009)

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all scholars of color have similar experiences.¹⁷⁴ 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 impacts in academia generally and legal academia specifically,¹⁷⁵ we attempted to categorize professors into binary groups: white versus non-white/scholars of color, and men versus women and nonbinary scholars.

First, race. All scholars in our dataset that Hayashi¹⁷⁶ identified as scholars of color—based on appearing at any point in time in the AALS 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), based on law-school biographical webpages. We also manually reviewed the biographical webpages of all professors teaching at the six HBCU 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.¹⁷⁷ Of course, “this corresponds to sex assigned at birth, which represents another limitation of our data set.”¹⁷⁸ 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 professors¹⁷⁹ and manually matching names to our sample.

¹⁷⁴ Cf. Meera Deo, *Why BIPOC Fails*, 107 VA. L. REV. ONLINE 115, 124–27 (2021) (describing strengths and challenges of such grouping).

¹⁷⁵ See *supra* Section I.A (referencing scholarship which frequently groups together scholars of color).

¹⁷⁶ Hayashi, *supra* note 118.

¹⁷⁷ 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.

¹⁷⁸ Tietz & Price, *supra* note 1, at 322 n.61.

¹⁷⁹ Michael Madison, *Law, Technology & Society Researchers*, <http://madisonian.net/home/law-and-tech-faculty/>.

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.¹⁸⁰ 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 acknowledgement, noting the acknowledging professor and the acknowledged professor. Networks were generated using the OpenORD algorithm. 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 acknowledgements).

We also conducted a regression analysis to see how the race/gender disparity 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*, and *Papers Published*, *Race*, and *Gender*.¹⁸¹ We also did a distribution analysis to see how race/gender is distributed across law school rankings.

IV. RESULTS

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

¹⁸⁰ GEPHI, <https://gephi.org/>.

¹⁸¹ WNS = Women and Non-Binary Scholars. In most regressions, *White Men* was omitted due to collinearity.

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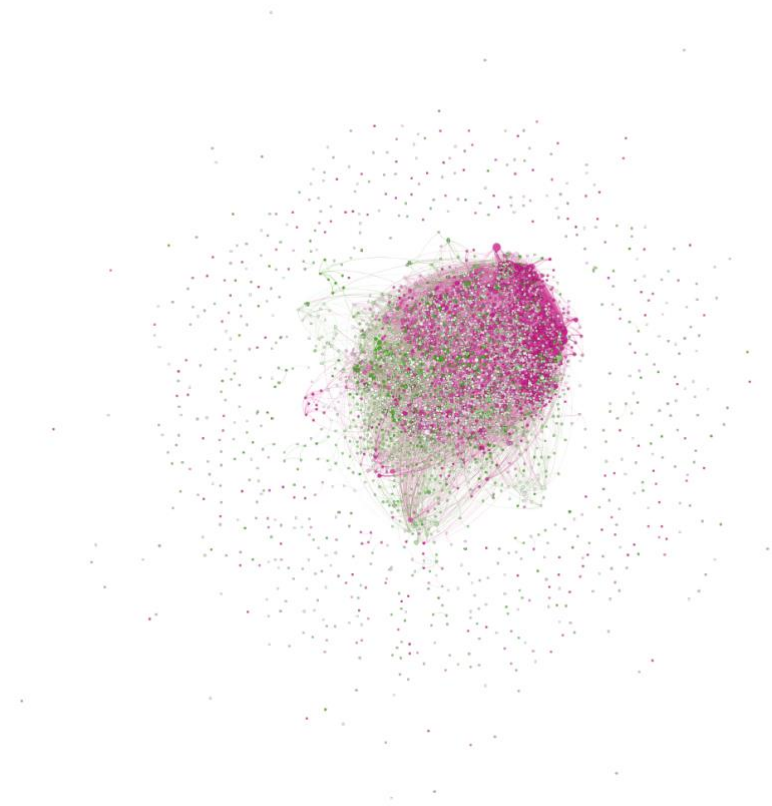


Figure 1

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 acknowledgements (nearly twice the next-most-acknowledged professor).

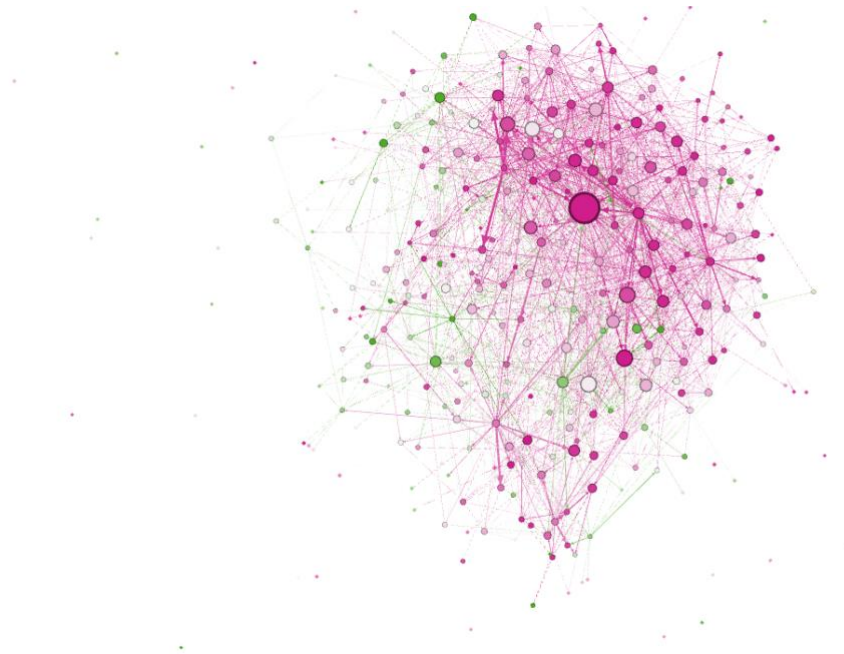


Figure 2

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).¹⁸² Professors were acknowledged a median of three 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 (Table 1).

Table 1

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

¹⁸² 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).

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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.

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

Table 2

Name	School¹⁸³	Acknowledgements
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

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., its positioning in the web) also matters in terms of framing their influence or engagement in the scholarly community. We observed informally that there were often differences between a

¹⁸³ School are listed as they appear in our dataset; some scholars have since moved.

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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).

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 acknowledge scholars.

Scholars from higher ranked schools are acknowledged more often than scholars from lower ranked schools (Figure 3A).

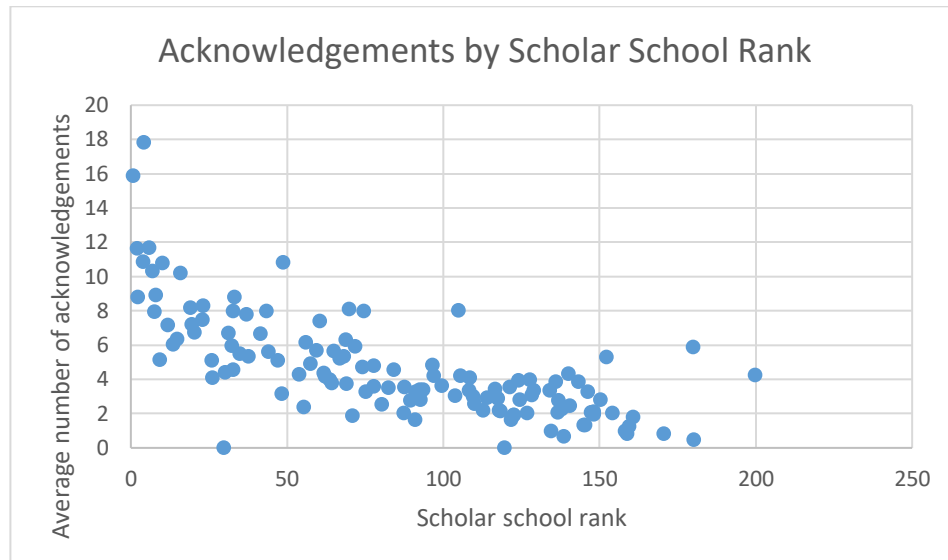


Figure 3A

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 (Figure 3B):¹⁸⁴

¹⁸⁴ Betweenness centrality was calculated here using undirected edges.

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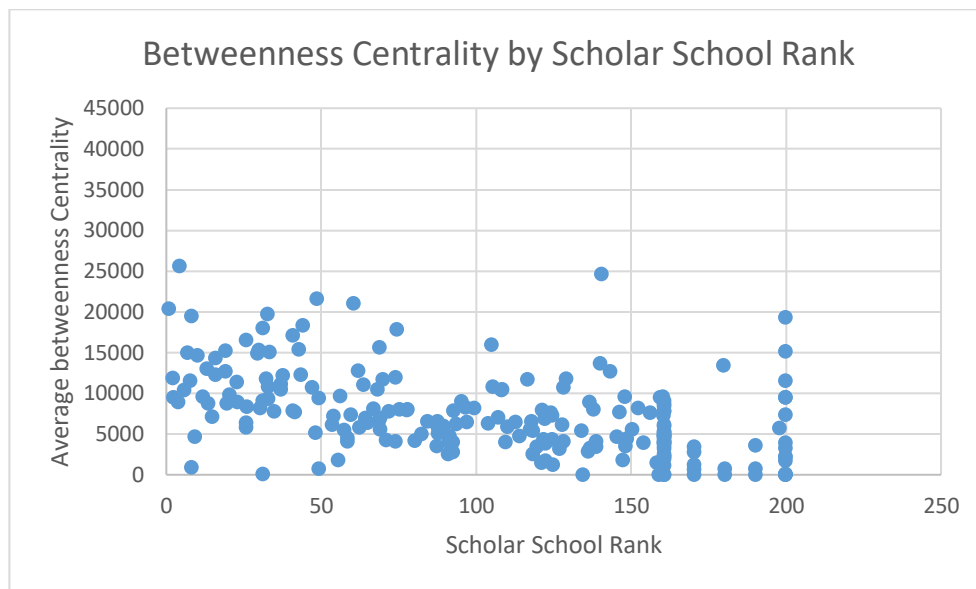


Figure 4B

Authors also tend to acknowledge scholars from schools that are similarly ranked to their own (Figure 4).

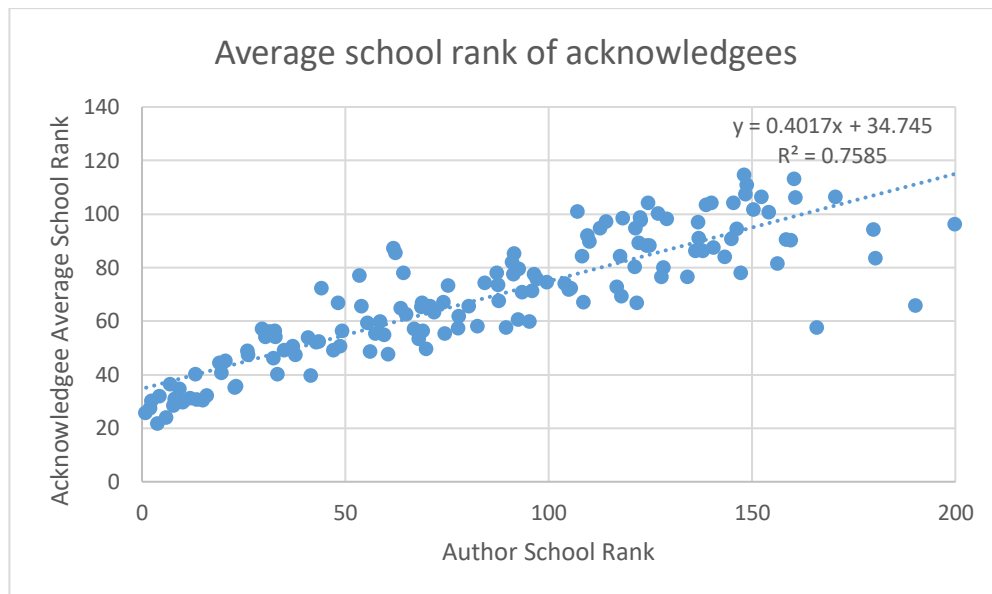


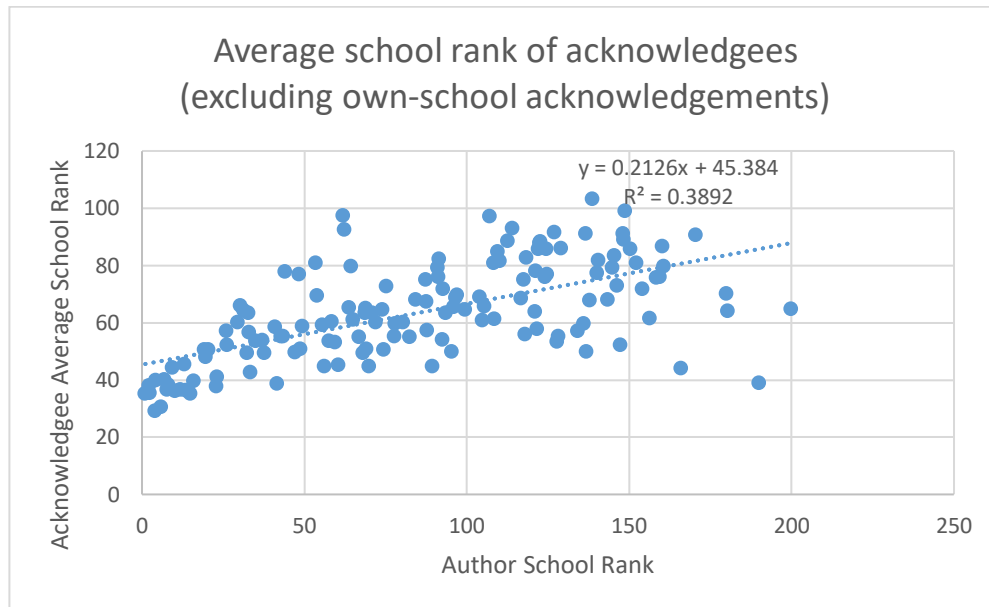
Figure 5

A substantial fraction of this effect is due to own-school acknowledgements;

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25% of all acknowledgements in our dataset are to scholars at the author's own school. The fraction of own-school acknowledgements 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 acknowledgements to evaluate¹⁸⁵). 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 acknowledgements. New Hampshire, Kansas, North Dakota, and William & Mary all had particularly strong cross-boundary scholarly networks, with more than 90% other-school acknowledgements. Among the T14 law schools, Yale has the most in-school acknowledgements (28%) and Penn the fewest (11%). There is no significant correlation between school rank and the fraction of own-school acknowledgements.

When own-school acknowledgements 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 (Figure 5). Half of all acknowledgements are to scholars at schools within 20 of the author's own school in the US News ranking.



¹⁸⁵ Of the 201 schools in our dataset, 121 had at least 100 acknowledgements made by authors associated with that school; we included those 121 in this analysis.

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In addition to a peer-school bias, authors tend to more frequently acknowledge those at higher-ranked institutions than their own. Acknowledged scholars were on average at schools ranking seven spots higher than the authors acknowledging them.¹⁸⁶

C. Race

White scholars are acknowledged about 14% more on average than scholars of color ($p < .01$) (Figure 6).

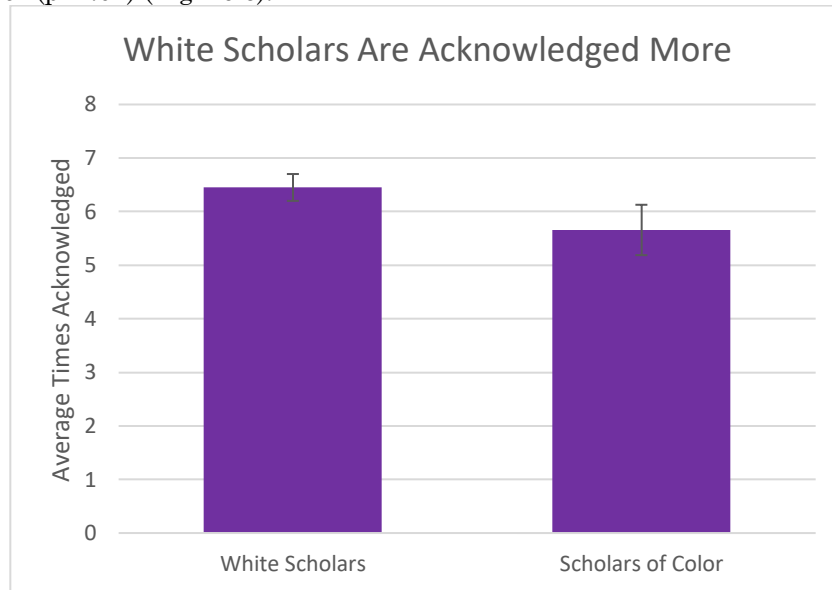


Figure 7

D. Gender

Men are acknowledged about 35% more on average than women and

¹⁸⁶ 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.

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nonbinary scholars ($p < 0.00001$) (Figure 7).

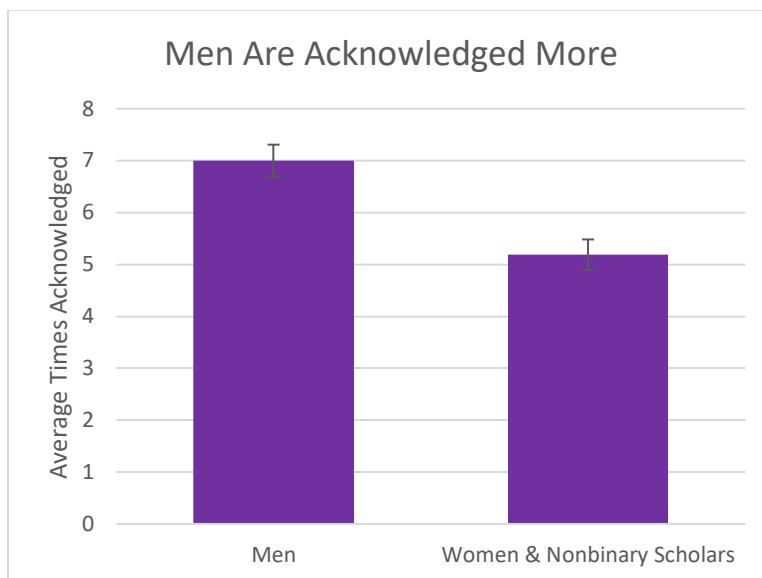


Figure 8

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 acknowledgement by both characteristics together (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 ($p = 0.035$).

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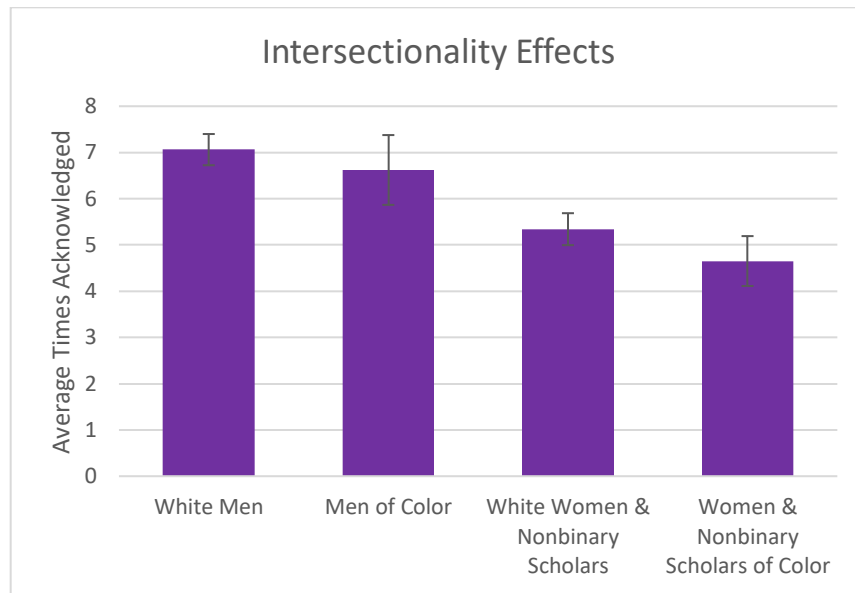


Figure 9

In the aggregate, white men receive 60% of acknowledgements, white women and nonbinary scholars 25%, men of color 9%, and women and nonbinary scholars of color 6% (Figure. 9).

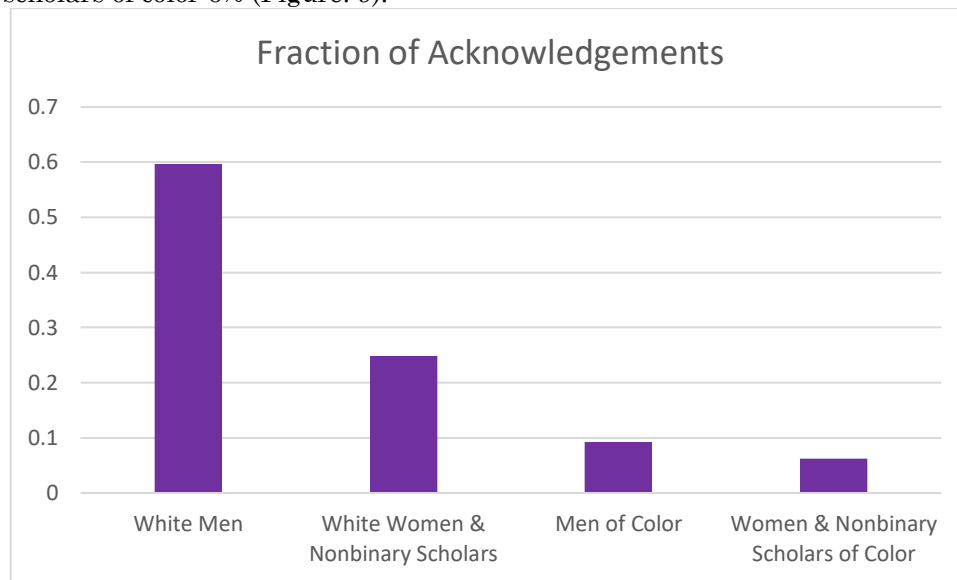


Figure 10

Of course, since white men are the majority of our sample, at 53.3%, and the most populous group in the legal academy overall, it is unsurprising that they are acknowledged most. Figure 10 shows the differences that emerge when we look for over- or under-acknowledgement relative to population prevalence—

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that is, by dividing the fraction acknowledged by the fraction of that group in our overall sample population. If white men make up 53% of the sample population, all things being equal we'd expect them to make up 53% of acknowledgements. All things aren't equal, of course, and they make up 60% of acknowledgements; they are over-acknowledged. Men are over-acknowledged; women and nonbinary scholars, especially of color, are underacknowledged.

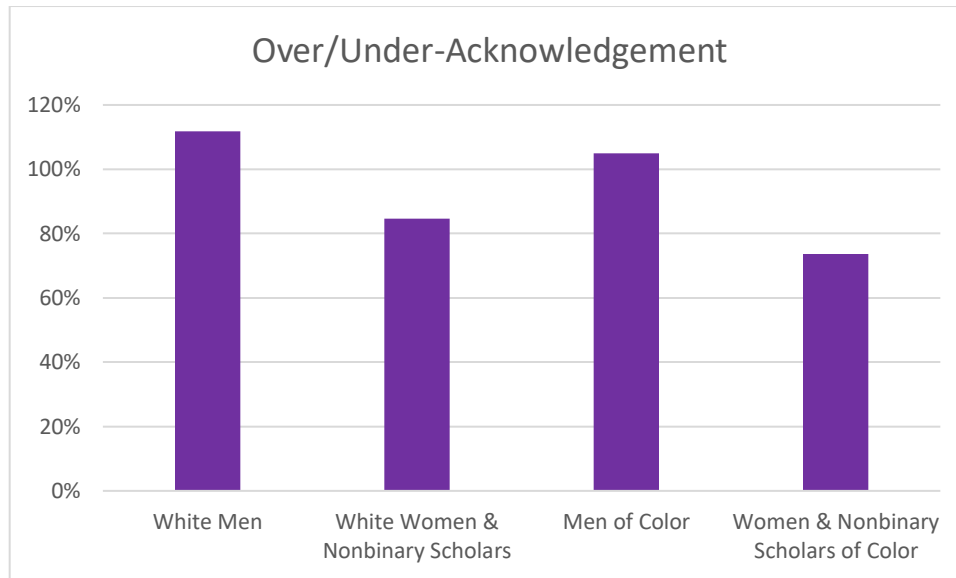


Figure 11

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

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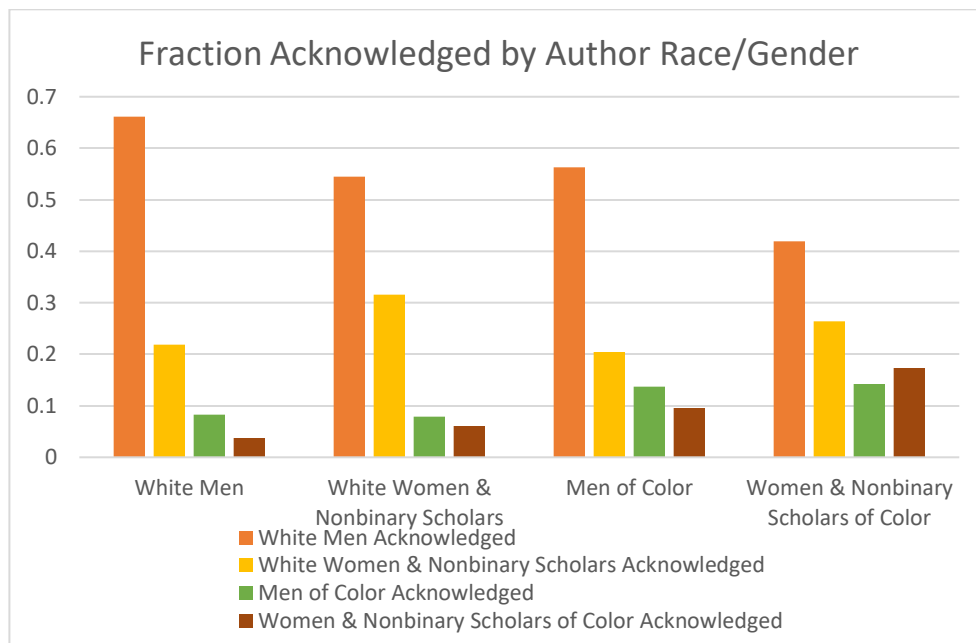


Figure 12

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Over/under-acknowledgement accordingly also breaks down differently by author group (Figure 12).

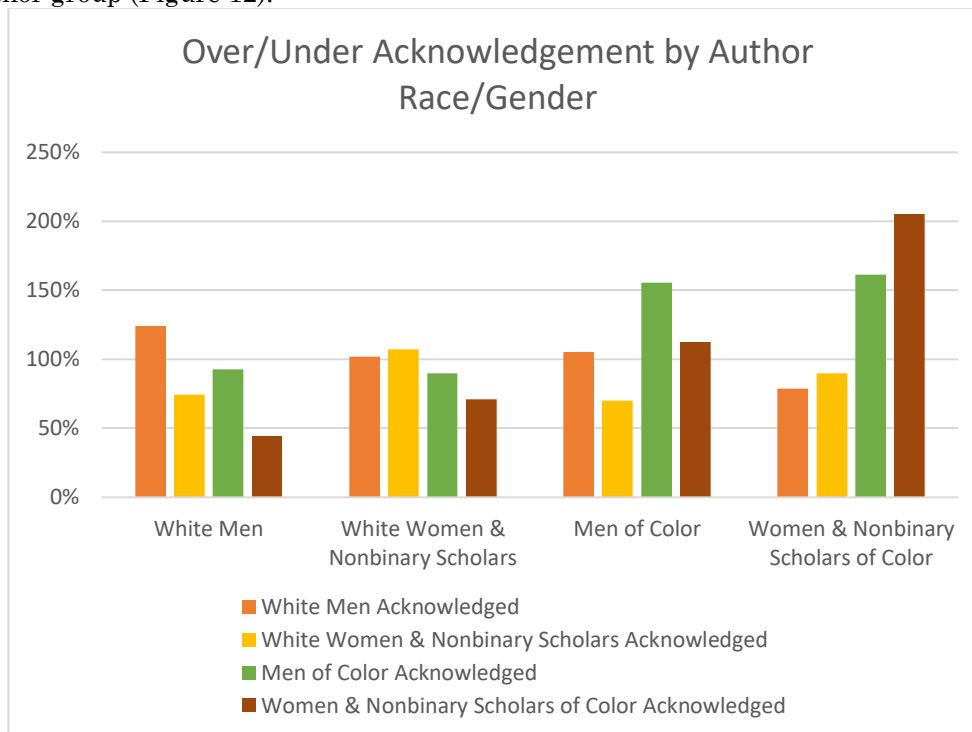


Figure 13

Every group over-acknowledges its own group¹⁸⁷—indeed, 47% of all acknowledgements 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.

F. School rank and race/gender

Seeing that professors have a tendency to “acknowledge up,”¹⁸⁸ and that top-ranked law schools are thought to have less diverse faculty, we further analyzed

¹⁸⁷ Again, we recognize the artificiality of our “groups,” but use them nonetheless as the best we can do. *See supra* notes 174–175 and accompanying text.

¹⁸⁸ *See supra* 186.

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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 disparity we see.

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*¹⁸⁹, with the latter two including nonbinary scholars) across school rankings. Since law schools have varying faculty sizes, we couldn't simply consider gross number of professors. While we don't have faculty size in our dataset, we do have a large data set of professors and their demographics/affiliations. So we broke the rankings up into 10 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 data set 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.¹⁹⁰ (Table A3). 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.¹⁹¹ (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 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 *Weighted Indegree*—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

¹⁸⁹ Because these terms are numeric variables in our analysis, we've capitalized them in this discussion.

¹⁹⁰ 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.

¹⁹¹ See Figure 1 in Appendix. *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.

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School Rank,; all except *Men of Color* are statistically significant.¹⁹²

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.¹⁹³

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 sub-community we should expect to see some insularity within the community and (perhaps) less own-school acknowledgement. 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% 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 acknowledgements by tech/IP professors were to other members of that sub-community (51.6%). Own-school citations were lower, however, as

¹⁹² 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 did not substantially change the results.

¹⁹³ 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*.

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might be expected for a community with relatively few professors per school; 17.2% of tech/IP author acknowledgements 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 ($p = 0.005$) (Figure 13).

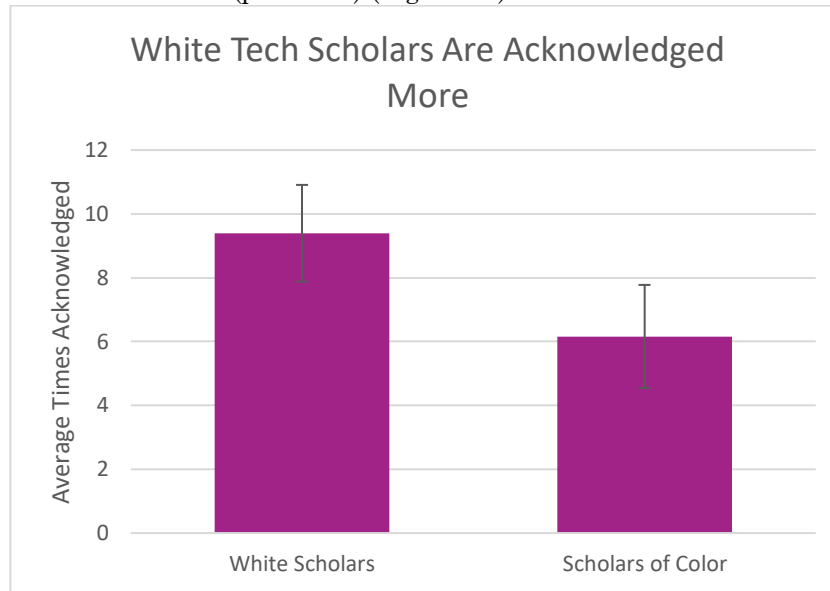


Figure 14

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

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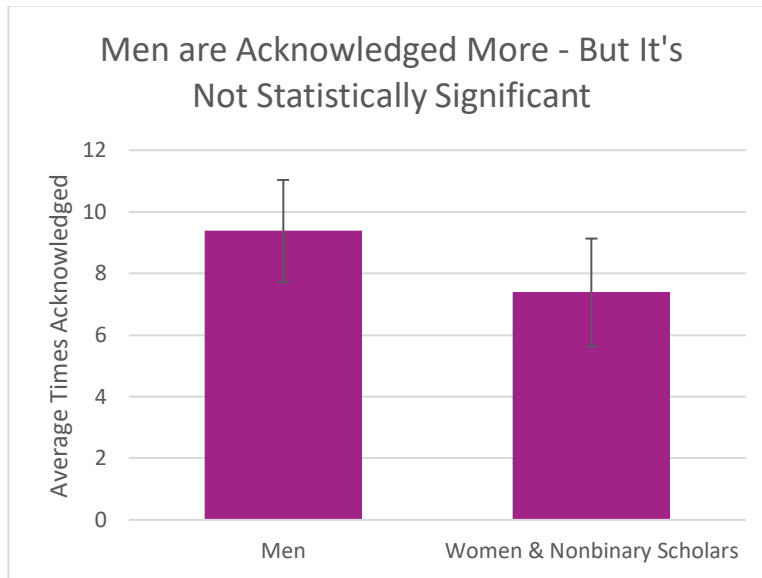


Figure 15

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

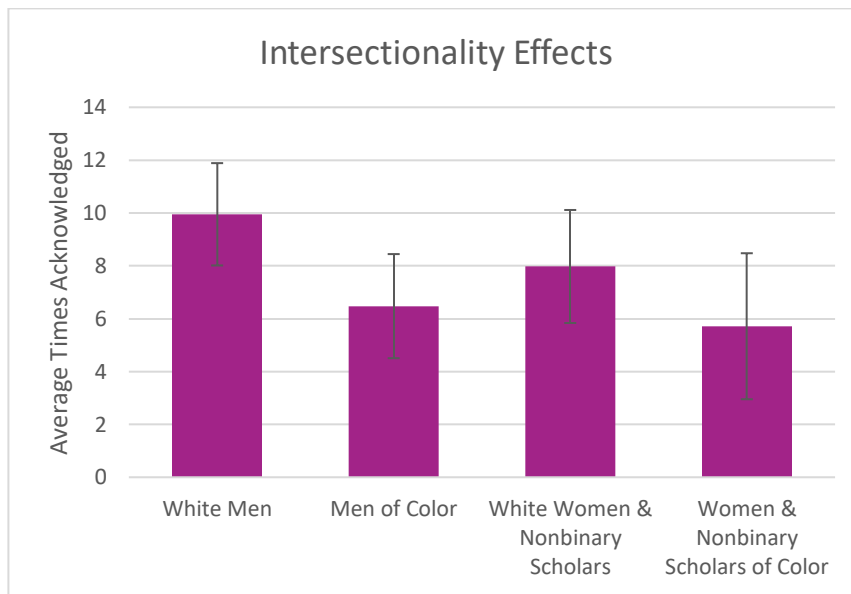


Figure 16

(You might wonder whether the presence of Mark Lemley, the most-

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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 of knowledge co-production in legal scholarship. That is, it's not just citation counts or article placement that are different for these groups: it's the legal academia social network.

As we noted at the outset, acknowledgements are an imperfect proxy for scholarly community. For instance, over-acknowledgement 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 expectations¹⁹⁴ and thus *possibly* less time to offer comments; the race/gender imbalance of questions/comments at conferences,¹⁹⁵ which may lead to acknowledgements; the tendency of some authors to try to cultivate particularly fancy or senior authors in their acknowledgments, who are disproportionately white and male; varied demographics of subfields, each of which might have its own acknowledgement norms; or any number of other possibilities.¹⁹⁶ There are many possibilities, even if none 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. 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 network landscape based on co-authorship and citation. Acknowledgments probably present a fuller view of academic communities.

Even if acknowledgements *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 acknowledgements 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

¹⁹⁴ See *supra* notes 22, 34 & accompanying text.

¹⁹⁵ See, e.g., Nicholson Price (@WNicholsonPrice), TWITTER (Mar. 30, 2019, 8:24 PM), <https://twitter.com/WNicholsonPrice/status/1112148595371724800>.

¹⁹⁶ For instance, could the acknowledgment practices of constitutional law—notoriously white-male-driven—be different from intellectual property?

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in placing a work, if acknowledgements are a kind of academic currency,¹⁹⁷ then 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 acknowledgements *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 acknowledgements 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 raced, 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 acknowledgement 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 acknowledgements and not, for instance,

¹⁹⁷ Cite the other acknowledgements piece

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default to acknowledgements 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,¹⁹⁸ 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 seem likely to help build more diverse scholarly networks. Reaching out to more diverse scholars for comments is, of course, something of a two-edged sword; on the one hand, strengthening diverse networks seems 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.¹⁹⁹ 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—is to work hard to diversify the legal academy itself. Build a diverse legal academy and the network effects will help with the rest.

¹⁹⁸ 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 ANCESTRY L.J. 65 (2004); Priya Baskaran, *Service, Scholarship, and Radical Citation Practice Symposium Essays*, 73 RUTGERS U.L. REV. 891, 908–09 (2021).

¹⁹⁹ Andrew W. 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); Baskaran, *supra* note 198.

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 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 $G > .90$ then they were assigned a 0 for gender, and if $G < -.90$ 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.

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B. Summary statistics & regressions

For all tables and regressions:

*** $p < 0.001$

** $p < 0.01$

* $p < 0.05$

WNS means Women and Nonbinary Scholars

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.

Variable	Std. Dev.
<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

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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

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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***

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Regression 1:

```
lm(formula = WeightedIndegree ~ MenofColor + WhiteWNS + WNSofColor
+ SchoolRank, data = nodes)
```

Coefficients:

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

Regression 2:

```
lm(formula = WeightedIndegree ~ MenofColor+ WhiteWNS + WNSofColor +
PapersPublished + SchoolRank, data = nodes)
```

Coefficients:

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

Regression 3:

```
lm(formula = WeightedIndegree ~ MenofColor + WhiteWNS + WNSofColor
+ PapersPublished, data = nodes)
```

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

Regression 4:

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lm(formula = WeightedIndegree ~ MenofColor + WhiteWNS + WNSofColor,
data = nodes)

Coefficients:

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

Regression 5:

lm(formula = WeightedIndegree ~ race + gender + PapersPublished + SchoolRank,
data = nodes)

Coefficients:

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

Regression 6:

lm(formula = WeightedIndegree ~ WhiteMen + WhiteWNS + WNSofColor +
SchoolRank, data = nodes)

Coefficients:

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

Residual standard error: 9.127 on 7058 degrees of freedom
Multiple R-squared: 0.08777, Adjusted R-squared: 0.08726
F-statistic: 169.8 on 4 and 7058 DF, p-value: < 2.2e-16

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Regression 7:

lm(formula = WeightedIndegree ~ WhiteMen + WhiteWomen + POCWomen, data = nodes)

Coefficients:

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

Residual standard error: 9.512 on 7059 degrees of freedom
Multiple R-squared: 0.009, Adjusted R-squared: 0.008579
F-statistic: 21.37 on 3 and 7059 DF, p-value: 8.941e-14