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Early Modern Social Networks: Antecedents, Opportunities and Challenges·

Abstract: This article reflects on the rising use of concepts, theories and methodologies taken from social network analysis in early modern history, along with the opportunities and challenges it presents. Scholars have been quick to attribute the growing interest in historical social networks to movements for interdisciplinary research, new possibilities presented by digital technologies, and the prominence of the term 'social network' in present-day culture. In contrast, this article reconnects recent trends to longstanding attention to the nature of early modern social relations, which has its roots in the foundations of modern social thought laid in the nineteenth and early twentieth centuries, and developed through the post-war decades in both history and sociology. In doing so, the article shows the extent to which social network analysis shares antecedents, interests and goals with more traditional historical methods. It argues that, when sensitively applied, network approaches present many opportunities for historians engaging with enduring questions about the nature of social relations in the past.

Since the turn of the twenty-first century, the rise of social network concepts and methodologies in history has been both marked and often remarked upon.[1] They can be deployed in almost any historical context, but the early modern period has proved particularly fertile ground. Even a brief survey of the literature published in this field bears out how recurrent the term 'social network'—or its metaphorical doppelganger, 'web'—has become. Scholars have described interactions of a political or religious nature in terms of networks, both within and across national borders,[2] and networks have been identified between many different exiled groups.[3] Various 'social and intellectual networks' that shaped early modern associational life have been conceived in terms of networks, not least the 'Republic of Letters': its ties of correspondence, patronage, publishing and intellectual

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[1] For accounts of the phenomenon, see Joanna Innes, "Networks' in British History", *East Asian Journal of British History*, 5, (March 2016), pp. 51-72; and Robert Michael Morrissey, "Archives of Connection: "Whole Network" Analysis and Social History", *Historical Methods*, 48, 2 (2015), pp. 67-79. For further discussion about the rise of network approaches in historical research, see Bonnie H Erickson, "Social Networks and History: A Review Essay", *Historical Methods*, 30, 3 (1997), pp. 149-58; Charles Wetherell, "Historical Social Network Analysis" in M. van der Linden and L J Griffin (eds), *New Methods for Social History* (Cambridge, 1999), 125-44.

[2] Jeremy Gregory and Hugh McLeod (ed.), *International Religious Networks* (Woodbridge, 2012).

[3] Gaby Mahlberg, "*Les Juges Jegez, se Justifiants* (1663) and Edmund Ludlow's Protestant Network in Seventeenth-Century Switzerland", *The Historical Journal*, 57, 2 (2014), pp. 369-96; John Bergin, "Irish Catholics and their Networks in Eighteenth-Century London", *Eighteenth-Century Life*, 39, 1 (Jan 2015), pp. 66-102.

exchange are well suited to 'network' conceptualisations.[4] Indeed through networks, the communication of knowledge has been taken beyond Europe in line with arguments about early modern 'globalization'.[5] Similarly suited to network approaches are trade and commercial activities. Debt and credit relations have loomed large: often underpinned by law, these transactions could generate detailed records from which chains of personal and financial interaction can be traced.[6] The study of merchants has been touched by the language of networks, and the myriad 'go-betweens'—the diplomats, writers, translators and castaways—who facilitated global connections have not escaped scrutiny either.[7]

While the metaphorical use of 'networks' is long-standing, a distinctive feature of recent work is a tendency to apply techniques developed in the field of network analysis. Underpinned by mathematical graph theory, network analysis is used across disciplines: genetics, eco-systems, communications infrastructure and financial markets are all studied through underlying structures of connected nodes.[8] Sociologists use the same methods to study relations between people and this—'social network analysis'—has been taken up by historians.[9] Digital methods are characteristic of these kinds of histories. Computer-generated network visualisations represent social connections as graphs of dots with

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[4] See for example, "AHR Forum: Mapping the Republic of Letters", *American Historical Review* 122, no. 2 (2017), pp. 399-462; Pat Carol, *Republic of Women: Rethinking the Republic of Letters in the Seventeenth Century* (Cambridge, 2012); Anthony Grafton, "The Republic of Letters in the America Colonies: Francis Daniel Pastorius Makes a Notebook", *The American Historical Review* 117, no. 1 (2012), pp. 1-29; David A. Kronick, "The Commerce of Letters: Networks and 'Invisible Colleges' in Seventeenth- and Eighteenth-Century Europe", *Library Quarterly*, 71, 1 (2001), pp. 28-43.

[5] Benjamin Breen, "No Man is an Island: Early Modern Globalization, Knowledge Networks, and George Psalmanazar's Formosa", *Journal of Early Modern History*, 17, 4 (2013), pp. 391-417.

[6] John F. Padgett and Paul D. McLean, "Economic Credit in Renaissance Florence", *Journal of Modern History*, 63, 1 (2011), pp. 1-47. See also, for example, Margot Finn, *The Character of Credit: Personal Debt in English Culture 1740-1914* (Cambridge, 2003); Laurence Fontaine, "Antonio and Shylock: Credit and Trust in France c.1680-1780", *The Economic History Review*, 54, 1 (2001), pp. 39-57; Andres Gestrich and Martin Stark (eds), *Debtors, Creditors and their Networks: Social Dimensions of Monetary Dependence from the Seventeenth to the Twentieth Century* (London, 2015).

[7] Alison Games, *The Web of Empire: English Cosmopolitans in an Age of Expansion, 1560-1660* (Oxford, 2008); essays in "Forum: Transatlantic Network", *International Journal of Maritime History*, 23, 2 (2011), pp. 263-326; Tijl Vanneste, *Global Trade and Commercial Networks: Eighteenth-Century Diamond Merchants* (London, 2011); Simon Schaffer, Lissa Roberts, Kapil Raj, and James Delbourgo eds, *The Brokered World: Go-Betweens and Global Intelligence, 1770-1820* (Sagamore Beach, MA, 2009). On apprenticeship practices in England, see Timothy Leunig, Chris Minns and Patrick Wallis, "Networks in the Pre-Modern Economy: the Market for London Apprenticeships, 1600-1749", *Journal of Economic History*, 71, 2 (2011), pp. 413-43. On the networks in the English book trade, see John Hinks, "The Book Trade in Early Modern Britain: Centres, Peripheries and Networks", in Benito Rial Costas (ed.), *Print Culture and Peripheries in Early Modern Europe: a Contribution to the History of Printing and the Book Trade in small European and Spanish Cities* (Biggleswade, 2013), pp. 101-26; and on the transmission of printed, oral and manuscript news in Europe, see Joad Raymond and Noah Moxham (eds), *News Networks in Early Modern Europe* (Boston, 2016).

[8] Guido Caldarelli and Michele Catanzaro, *Networks: A Very Short Introduction* (Oxford, 2012), pp. 1-6. See also Alberto-László Barabási, *Linked: How Everything is Connected to Everything Else and What it Means for Business, Science, and Everyday Life* (New York, 2014).

[9] An online resource dedicated to the field of 'historical social network analysis' has a multilingual biography of published research: www.historicalnetworkresearch.org [accessed 14/12/2016].

connecting lines, allowing for both synchronic and diachronic patterns to be observed.[10] A new age of digitisation has also opened up new sources and research methods: historians now routinely work with digitised and searchable archives, which facilitate the discovery of relationships spanning time and space in a way previously unthinkable.[11] Working with 'big data' has become more prominent in historical research and has fed into the statistical analysis of networks, as efforts are made to quantify individuals and the connections between them.[12] New vistas of opportunity, however, have not dented the continuing commitment to qualitative source work: the close study of the diaries, letters, or institutional records from which networks have been discerned remains fundamental.[13] This mixture of quantitative and qualitative analysis, together with digitally assisted data handling and visualisation, has been instrumental in the development of several on-going collaborative digital humanities projects. These include Stanford's *Mapping the Republic of Letters* project, the University of Oxford's *Cultures of Knowledge: Networking the Republic of Letters 1550-1750* and Carnegie Mellon University's *Six Degrees of Francis Bacon*—all of which aim to bring new insight into the networks of correspondents that drove intellectual and cultural change over the early modern period.[14]

This rise of social networks in historical research, both metaphorically and in its more technical incarnation, has been attributed to a number of factors. First is the increasing prominence of digital technologies within the discipline. These new possibilities have cultivated interest in networks, as technology has greatly enhanced our ability to gather, store and analyse data, and to visualise its results in eye-catching graphics—even if the impetus to collect and analyse data on a wide scale has precedent in economic history and cliometrics. Secondly, the increased prevalence of networks is partly a result of pressures to produce 'interdisciplinary' research, an established characteristic of the discipline, but one with

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[10] See, for example, Emily Buchnea, "Transatlantic transformations: visualizing change over time in the Liverpool-New York trade network, 1763-1733", *Enterprise & Society*, 15, 4 (Dec. 2014), pp. 687-721; Sheryllynne Haggarty and John Haggarty, "The Life Cycle of a Metropolitan Business Networks: Liverpool 1750-1810", *Explorations in Economic History*, 48, 2 (2011), pp. 189-206.

[11] Lara Putnam, "The Transnational and the Text-Searchable: Digitized Sources and the Shadows they Cast", *America Historical Review* 121, 2 (2016), pp. 377-402. See also Tim Hitchcock, "Confronting the Digital: Or, how Academic History Writing lost the plot', *Cultural and Social History*, 10, 1 (2013), pp. 9-23.

[12] Dan Edelstein, Paula Findlen, Giovanna Cerarani, Caroline Winterer and Nicole Coleman, "Historical Research in a Digital Age: Reflections from the Mapping the Republic of Letters Project", *American Historical Review* 122, 2 (2017), pp. 400-24.

[13] See for example, Ruth Ahnert and Sebastian E. Ahnert, "Protestant Letter Networks in the Reign of Mary I: a Quantitative Approach", *ELH*, 82, 1 (2015); Sheryllynne Haggarty and John Haggarty, "Visual Analytics of an Eighteenth-Century Business Network", *Enterprise & Society*, 11, 1 (2010), pp. 1-25.

[14] See the projects' respective websites at http://republicofletters.stanford.edu/index.html ; http://www.culturesofknowledge.org/; http://www.sixdegreesoffrancisbacon.com/ [accessed, 10/05/2016].

increasing prominence.[15] Thirdly, and perhaps most obviously, the prevalence of the term 'social network' in modern discourse must take some responsibility.[16] Technological innovations and the development of social media have changed the ways we can interact with one another, facilitating social and professional connections across boundaries of time and space. A society keenly aware of its own ideal of connectivity is likely to be one interested in identifying and studying analogous relationships in the past.[17]

Each of these factors has contributed to the momentum behind the study of social networks in history. But to leave it there does not do justice to previous historical scholarship and how far this, too, has fostered a network approach to social relations. The rise of social network methodologies can be understood as only the most recent manifestation of longstanding interest in the nature of social relations in early modern society, which stretches back to the foundations of modern social thought laid in the nineteenth and early twentieth centuries. The period at hand was then understood as the moment when 'modern' patterns of social relations took shape, with scholars pointing to fundamental shifts in social structure, economic practice and political organisation. The label 'early modern' might still be in use today—with all its implications of change—but decades of research has since revisited and contested traditional narratives of progress. At the same time, the broadened perspective afforded by global histories has further demonstrated the futility of a single account of social transformation. In its place, there is a picture of complexity, diversity and dynamism. Points of contact within and across different regions of the globe multiplied, fostering new forms of interaction as well as intensifying those relationships that had long existed; and these connections were sustained by improving technologies of travel and communication. The question for early modern historians is how to make sense of these ever-shifting patterns of trade, patronage, correspondence, sociability and more? Networks have become one possible answer for many. During the course of research into the British satirist and tavern-keeper Edward 'Ned' Ward (1666-1731), for example, I turned to social networks to help reconstruct his working relationships at a time of the print industry's rapid expansion.[18] Increasing numbers of printers, booksellers and

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[15] Peter Burke, *History and Social Theory* (2nd edn., Cambridge, 2005). On earlier moves towards interdisciplinary approaches, see "History, Sociology and Social Anthropology: Conference Report", *Past & Present*, 27, (1964), pp. 102-8; Eric Hobsbawm, "From Social History to the History of Society", *Daedelus*, 1, 1 (1971), pp. 20-45; Keith Thomas, "History and Anthropology", *Past & Present,* 24, (1963), pp. 3-24.
[16] Kadushin, *Understanding Social Networks*, p. 2.
[17] For an account of networks in the modern world, see, for example, Duncan Watts, *Six Degrees: The Science of a Connected Age* (New York, 2003). For a historical account influenced by modern notions of networks, see Niall Ferguson, *The Square and the Tower: Networks, Hierarchies and the Struggle for Global Power* (London, 2017).
[18] Kate Davison, *Laughter and Society in Early Eighteenth-Century Britain: Ned Ward's World* (forthcoming). On Ned Ward, see the biography H. W. Troyer, *Ned Ward of Grubstreet* (Cambridge, Mass., 1946) and James Sambrook, "Edward [Ned] Ward (1667-1731)" *Oxford Dictionary of National Biography* (Online edn., 2004).

authors active in London, and with developing contacts nationally and internationally, made for a daunting list of names and connections, but network analysis provided the tools to identify patterns within the entangled web of relationships. The print industry centring on London, but reaching much further afield, is just one example of the increasing complexity and dynamism that has been discovered in diverse areas of early modern life. Network analysis is particularly well suited to handle that complexity: the method may appear to be a response to the development of our own digital age, but the findings of previous research have also done much to stimulate thinking in terms of networks.

The first half of the article retraces the steps that have encouraged historians to take up network concepts and methods. It shows that the identification of networks has deep roots in historiography, while also highlighting the extent of common antecedents, interests and aspirations between social scientific network analysis and historical methods. Through this, the article aims to set out where the new approach presents opportunities for historians engaging with traditional historical questions about individuals and communities from range of perspectives. Reconstructing historical social networks, however, is not straightforward: the latter part of the article reflects on the methodological challenges posed by working with this theoretical approach without losing a sense of historicism.

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The underlying concern in studies of social networks is to capture how people connect to one another, to what ends and with what results. As a question for historical research, however, this was broached in the late nineteenth century when Ferdinand Tönnies sought to explain the origins of 'modern' society. He proposed a distinction between *Gemeinschaft* and *Gesellschaft* to describe the historical transition from medieval rural communities—in which ties were principally with kinship and neighbours—to modern urbanised, industrialised and bureaucratised societies, where contractual social arrangements had superseded communal obligations.[19] In sketching this long-term evolutionary change, Tönnies identified the early modern period as the era of transformation. Max Weber's study of the relationship between Protestantism and capitalism also identified crucial changes in the nature of social relations in this period. He argued that the emphasis on inner faith

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As the author of diverse works, Ward is also a regular presence in the footnotes of books and articles on various topics relating to eighteenth-century Britain. On the print industry in early eighteenth-century Britain, see especially James Raven, *The Business of Books. Booksellers and the English Book Trade* (London, 2007); Robin Myers and Michael Harris (eds), *The Development of the English Book Trade 1700-1899* (Oxford, 1991); Leslie Howsam and James Raven (eds), *Books between Europe and the Americas: Connections and Communities, 1620-1860* (Basingstoke, 2011).

[19] Ferdinand Tönnies, *Community and Civil Society* (1887), ed. Jose Harris (Cambridge, 2001).

associated with Protestantism, together with the self-interested accumulation typical of capitalist practices, combined to encourage a sense of individualism that is characteristic of the modern world.[20] Tönnies and Weber are now considered among the founders of modern sociology, but their narrative of the decline of 'neighbourliness' and the concurrent rise of 'individualism' also had a lasting impact on post-war social historians as they set about recovering non-elite social relations.

In contrast to these modernising narratives, social historians painted a picture of continuity rather than change, as communal ties were shown to remain strong throughout the early modern period. In this work, local area studies became an important methodology: it was advocated by Alan Macfarlane's *Reconstructing Historical Communities* (1977) and put into practice by the pioneering efforts of Keith Wrightson and David Levine on a rural Essex village in the sixteenth and seventeenth centuries. Compiling all available local records—including parish registers, court records, and tax collections—they created a collective biography, or prosopography, which included every named individual within the parish and correlated findings in different sources. Jeremy Boulton applied a similar methodology in an urban context, and both found 'local social systems' at work, as personal contact and mutual reliance appeared frequent within the dynamics of the ward or parish.[21] An alternative approach to the geographically defined community was to focus on the institutions that brought individuals together, such as guilds and livery companies, which have been cast as 'worlds within worlds'.[22] As with a ward or parish, the institution provided the scope of archival research, allowing the historian to work through a body of material and attend to the linkages found between individuals who feature in the records. While the meta-category of analysis remained 'society', these works established that its larger structures were broken down into smaller clusters of communities, circumscribed by geographical or institutional boundaries.

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[20] Max Weber, *The Protestant Ethic and the Spirit of Capitalism* (1905), trans. Talcott Parsons (London, 1930).
[21] Keith Wrightson and David Levine, *Poverty and Piety in an English Village* (London, 1979); Jeremy Boulton, *Neighbourhood and Society: A London Suburb in the Seventeenth Century* (Cambridge, 1987). Alan Macfarlane, *Reconstructing Historical Communities* (Cambridge, 1977); see also the Earls Colne Project compiled the surviving records for the parish of Earls Colne in Essex over the period 1380-1854, http://www.alanmacfarlane.com/FILES/earlscolne.html [accessed 10/04/2018]. On the significance of 'a sense of place' to early modern communities, see also Phil Withington, *The Politics of Commonwealth: Citizens and Freemen in Early Modern England*, (Cambridge, 2005), p. 88. Steve Hindle, "A sense of Place?" in Alexandra Shepard and Phil Withington (eds), *Communities in Early Modern England: Networks, Place, Rhetoric*, (Manchester, 2000); Vic Gatrell also included chapters called "A Sense of Place" in his *City of Laughter: Sex and Satire in Eighteenth-Century London* (London, 2006), pp. 21-109 and *The First Bohemians: Life and Art in London's Golden Age* (London, 2014), pp. 3-28.
[22] Steve Rappaport, *Worlds Within Worlds: Structures of Life in Sixteenth-Century London* (Cambridge, 1989); see also Joseph P. Ward, *Metropolitan Communities: Trade Guilds, Identity and Change in Early Modern London* (Stanford, CA, 1997).

Social history's attention to the nature of community, and especially the proposed decline of neighbourliness, was matched by parallel developments in post-war social sciences. Rooted in Tönnies' classic exposition, the 'community lost' thesis had been prominent and it argued that individuals in modern culture had become no more than 'atoms' in 'mass society'.[23] Just as this thesis was contested by social historians, post-war sociologists also had a response. Richard L. Meier, for example, argued that the modern metropolis was a 'transaction-maximising system': although communities in twentieth-century American society had become less anchored in neighbourhood, individuals were reaching further afield for social contact, made possible by developments in transport, communications, and working and living habits.[24] These ideas allowed a more fluid notion of social relations to take root, though the foundation of the field of social network analysis is usually credited to Jacob Moreno's earlier work on the group dynamics of school children, which was published in 1934. Moreno's book—subtitled *A New Approach to the Problem of Human Interrelations*—took the crucial step of presenting diagrams of social connections, which he called 'sociograms' (Figure 1).[25] [FIG. 1 NEAR HERE] Twenty years later, the term 'social network' was first used for its analytical purchase in John Arundel Barnes's study of a small Norwegian community and, through the 1960s, social network concepts and methods gained traction.[26] They were popularised by Stanley Milgram's 'small world theory', which established the principle that people from around the world can be connected by relatively few paths in what became known as the 'six degrees of separation'.[27] But it was the efforts of Harrison White and his students at Harvard that propelled the field forward through a notable series of papers.[28] In 1973, one of those students, Mark Granovetter, published 'The Strength of Weak Ties', an article that demonstrated the significance of distant connections, rather than closer ones, for gaining opportunities and information otherwise inaccessible through an immediate social circle. Granovetter's article has been particularly influential and

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[23] See for example, William Kornhauser, *The Politics of Mass Society* (Glencoe, IL, 1959).
[24] Richard L. Meier, "The Metropolis as a Transaction-Maximising System", *Daedalus*, 97, 4 (1968), pp. 1292-1313.
[25] See, for example, M. E. J. Newman, *Networks: An Introduction* (Oxford, 2010), pp. 36-7. Moreno's ideas were developed with the support of the psychologist Helen Jennings, though published under his single authorship: see Jacob L. Moreno, *Who Shall Survive? A New Approach to the Problem of Human Interrelations* (Washington, 1934). For an account of their partnership, see Linton Freeman, *The Development of Social Network Analysis* (Vancouver, 2004), pp. 35-40.
[26] John Arundel Barnes, "Class Communities in a Norwegian Island Parish", *Human Relations*, 7 (1954), pp. 39-58.
[27] Stanley Milgram, "The Small-World Problem", *Psychology Today*, 2 (1967), pp. 60-7.
[28] Freeman, *The Development of Social Network Analysis*, chapter 8 "The Renaissance at Harvard", pp. 121-8. Particularly influential papers included, Harrison C. White, Scott A. Boorman and Ronald L. Breiger, "Social Structure from Multiple Networks I: Blockmodels of Roles and Positions", *American Journal of Sociology* 81, pp. 730-81 and Boorman and White, "Social Structures from Multiple Networks II: Role Structures", *American Journal of Sociology* 81, pp. 1384-446.

remains among the most cited in sociology.[29] The field reached maturity through the 1970s: institutionally, the International Network for Social Network Analysis was established in 1976, and the journal, *Social Networks*, followed in 1978.[30] The following year, another of White's students, Barry Wellman, argued powerfully for the benefit of a 'network analytic perspective' on community: instead of starting with solidarities, such as neighbourhood, kin or institution, networks look first for 'linkages', which could 'free the study of community from normative and spatial predilections'. 'Community lost' had become 'community liberated', as social scientists developed methods to capture the patterning of social relationships.[31] Indeed, for its practitioners, networks promised an overhaul in the ways in which social organisation could be conceived and analysed, while also accounting for social structures previously denounced as atomised and individualistic. Eager to spread the word, one of the first general introductions was published in 1982 by David Knoke and James H. Kuklinski with an eye on rendering the methodology accessible to scholars outside sociology.[32]

Around this time, social network methods began to make inroads into historical research. In 1984 Darrett and Anita Rutman, for example, turned to network analysis in their study of a community in the Chesapeake Bay between 1650 and 1750. Like other social historians of the time, a collective biography of the inhabitants formed the basis of the local study,[33] but they also systematically recorded the relationships between people—and network analysis was their tool. As they put it,

> We assume that relationships between people form observable networks ... any single individual lives in some relationships with other individuals, and these others with still others, some of whom live in relationship with the first, some not.[34]

The Rutmans' approach suggests that the shortcomings of existing approaches to community were felt as much by historians as sociologists, and that network analysis opened up alternatives. Working from a similar starting point, both had come to recognise that there was more to community than geographical proximity or institutional membership. For historians, exploiting hitherto unused records generated by local administration greatly advanced understandings of past societies, but it also resulted in definitions of community

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[29] Mark Granovetter, "The Strength of Weak Ties", *American Journal of Sociology*, 78, 6 (1973), pp. 1360-80.
[30] Charles Wetherell, "Historical Social Network Analysis" in M. van der Linden and L. J. Griffin (eds), *New Methods for Social History* (Cambridge, 1999), p. 126.
[31] Barry Wellman, "The Community Question: The Intimate Networks of East Yorkers", *American Journal of Sociology*, 84, 5 (1979), pp. 1201-31, here p. 1203.
[32] David Knoke and James H. Kuklinski, *Network Analysis* (London, 1982).
[33] Lawrence Stone, "Prosopography", *Daedalus*, 100, 1 (winter 1971), pp. 46-97. See also, for example, Wrightson and Levine, *Poverty and Piety*.
[34] Darret B. and Anita H. Rutman, *A Place in Time: Middlesex County, Virginia 1650-1750* (London, 1984), p. 27.

that were determined by the parishes, wards, guilds and livery companies in whose archives it was found. The concept of networks was recognised for its potential to cut across such social structures.

At the same time, the importance of these structures was further undermined by disciplinary shocks now associated with the 'cultural turn'. Early attempts to study the 'everyone else' who fell outside traditional elites had initially drawn inspiration from statistical and prosopographical analyses. These sociological methods promised to put history on the threshold of science: hypotheses about historical changes in social organisation, demography and economy could be tested against 'reliable' forms of statistical evidence. But, as an article by Charles Tilly from 1984 testifies, the optimism—never shared by all—was short-lived. In particular, it was becoming clear that numbers and charts alone could not account for the uniqueness of past lives and motivations; rather, they tended to reinforce determinism based on economic conditions or social positions. Tilly surmised that 'statistical analyses in themselves almost never yield unambiguous conclusions'; more often than not, 'an adequate explanation entails reconstructing historical actors' experiences of the situations in which they found themselves'.[35] Historical reconstruction of this sort required new tools. Playing on the search for alternative sources of methodological inspiration, Tilly asked 'will anthropology save us?'.[36] To an extent, it did. Armed with approaches advocated by anthropologists like Clifford Geertz, cultural interpretation moved up the agenda as historians focused their energies on analysing symbols, belief systems, and language in order to understand the mental worlds of past societies. Discourse analysis also became prominent as historians focused attention on what structured people's perceptions in different times and places.[37] By 1998, John Reynolds could document the declining use of numerical evidence gathered on a large scale: the 'flirtation with statistics' evident in earlier social and economic history had given way to 'the rise of deep narratives' associated with cultural histories.[38] Such radical shifts in historical practice provoked fierce controversy: there were concerns about the ability of discourse to explain change, which is ostensibly central to historians' work, and there were nagging questions about 'how to relate discourse to what historians had once

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[35] Charles Tilly, "The Old New Social history and New Old Social History", *Review (Fernand Braudel Centre)*, 7, 3 (1984), pp. 363-406, here p. 375.
[36] Tilly, 'The Old New Social History', p. 380.
[37] Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York, 1973), which includes the essay "Thick Description: Toward an Interpretive Theory of Culture", pp. 3-30. A classic example of Geertz's approach being utilized by a historian is Robert Darnton's analysis of a curious incident a printshop in eighteenth-century France in *The Great Cat Massacre and other Episodes in French Cultural History* (Harmondsworth, 1984), pp. 75-104. For a collections of essays exploring these developments, see Lynn Hunt (ed.), *The New Cultural History* (Berkeley, 1989)
[38] John Reynolds, "Do Historians Count Anymore? The Status of Quantitative Methods in History", *Historical Methods*, 31, 4 (1998), pp. 141-8.

called reality', as Lyndal Roper put it.[39] What was the relationship between discourses and the actions of actual people? Indeed, the logic of postmodernism threatened the possibility of reconstructing the lives of 'actual people' at all: if nothing exists outside language, then historians must be content with analysing representations of lives and events, since that is all there is. This position prompted impassioned defences of empiricism, as well as more measured calls to recognise both the limitations and transformative effects of the 'cultural turn'.[40] Debates such as these about historical practice are, by nature, open-ended, but their impact can be discerned in work on early modern social relations and the direction of travel has done much to encourage thinking in terms of networks.

Whereas earlier scholarship tended to conceive of society as a totality or system—as Patrick Joyce put it, 'something decidedly thing-like' in its nature—this sense of solidity was dismantled by the relativism advocated by cultural historians.[41] Attention to individual agency and contemporary language highlighted the contingency of categories like society, neighbourhood and community, which has encouraged historians not to take them for granted. This has resulted in renewed interest in the decisions and practices of historical actors, and the ways they contribute to the formation of something that might be called 'society' with a greater sensitivity to past meanings. For example, Phil Withington has shown that, in early modern England, 'society' was understood not as the cumulative result of social relations, but rather as the different ways in which people could be associated. In this capacity it had a variety of meanings, ranging from formally organised corporations to more informal day-to-day interactions and, indeed, networks.[42] A separate but related trend has been seen in sociology with the rise of 'post-societal' approaches, which dispense with the notion of society and turn attention instead to the mutable aspects of relations between individuals and institutions.[43] Historians' waning faith in the category of the 'national' is also

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[39] Lyndal Roper, "Beyond Discourse Theory", *Women's History Review*, 19, 2 (2010), pp. 307-19, here p. 308.
[40] On empiricism see, for example, Richard J. Evans, *In Defence of History* (London, 1997), esp. "Historians and their Facts", pp. 75-102. On evaluations of the 'cultural turn' see Paula S. Fass, "Cultural History/Social History: Some Reflections on a Continuing Dialogue", *Journal of Social History*, 37, 1 (2003), pp. 39-46; Jürgen Kocka, "Losses, Gains and Opportunities: Social History Today", *Journal of Social History*, 37, 1 (2003), pp. 21-8; Victoria E. Bonnell and Lynn Hunt, "Introduction" in Victoria E. Bonnell, Lynn Hunt and Richard Biernacki, *Beyond the Cultural Turn* (Berkeley, 1999), pp. 1-25; Patrick Joyce, "The Return of History: Postmodernism and the Politics of Academic History in Britain", *Past & Present*, 158 (1998), pp. 207-35; Ronald Suny, Patrick Brantlinger and Richard Handler, "Review Essays: What's Beyond the Cultural Turn?", *American Historical Review*, 107, 5 (2002), pp. 1475-520.
[41] Patrick Joyce, "The End of Social History?", *Past & Present*, 20, 1 (1995), pp. 73-91, here p. 75.
[42] Phil Withington, *Society in Early Modern England: The Vernacular Origins of Some Powerful Ideas* (Cambridge, 2010), pp. 116-18.
[43] Patrick Joyce, "What is the Social in Social History?", *Past & Present*, 206 (2010), pp. 213-48, here p. 225. The 'post-societal' position in sociology has been particularly associated with Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford, 2005). It also relates to the work of Zygmunt Bauman, who used the term 'liquid modernity' to capture the fluidity of modern society and the way a person moves through it with increased uncertainty, individualism and change, see Z. Bauman, *Liquid Modernity* (Cambridge, 2000).

a response to these developments. Where once studies that stopped at the border of nation states were common, recent decades have seen 'transnational' and 'global' histories become mainstream.[44] Oceanic history is also an expanding field. The Atlantic, Pacific and Indian Oceans are established areas of research, transcending traditional geographical distinctions to highlight new points of contact, cooperation and conflict.[45] This more flexible approach to social structures is mirrored by an increasingly 'de-centralised' conception of historical institutions. There is now greater attention to the micro-level actions and interactions of the people of which institutions such as trading companies, corporations, and governments comprised.[46] Similarly, there is an increasing sense that 'the economy'—like 'society'—is an abstraction: it is temporally and culturally contingent, given form by exchanges that are embedded in human relations. Hence the interest in concepts of debt, credit and trust, which are essential to the functioning of most economies.[47] Taken together, these developments have done much to encourage a fluid approach to social relations that network analysis is well equipped to handle.

In this light, the recent prominence of network analysis can be seen as a consequence of wider disciplinary developments. Its great strength is that it allows historians handle social structures in a way that embraces the dynamic and contingent notion of society that has become the norm. The concept of a network is neutral enough to capture relationships across time and space, and characterised by intimate familiarity, distant reserve, outright hostility, or anything in between. And it is flexible enough to account for relationships resulting from either work or play, be that intellectual endeavour, political faction, economic activity, craft guilds, marriage or routine social encounters at the local alehouse. In other words, it sidesteps the assumption underpinning earlier work that people

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[44] Sebastian Conrad, *What is Global History?* (Princeton, 2016); Pierre-Yves Saunier, *Transnational History* (Basingstoke, 2013); Akira Iriye, *Global and Transnational History: The Past, Present, and Future* (Basingstoke, 2014), esp. chapter 1 "The Rise of Global and Transnational History", pp. 1-18; Marine Hughes-Warrington, "World History and Global History", *The Historical Journal*, 51, 3 (2008), pp. 753-61.

[45] On the Indian Ocean, see Antoinette Burton, Madhavi Kale, Isabel Hofmeyr, Clare Anderson, Christopher J. Lee and Nile Green, "Sea Tracks and Trails: Indian Ocean Worlds as Method", *History Compass*, 11, 7 (2013), pp. 497-502. Routledge have recently published a series called "Seas in History", which includes Donald B. Freeman, *The Pacific* (London, 2013), Michael Pearson, *The Indian Ocean* (London, 2003), Paul Butler, *The Atlantic* (London, 2014) and Merja-Liisa Hinkkanen and David Kirby, *The Baltic and the North Seas* (London, 2014): https://www.routledge.com/Seas-in-History/book-series/SE0207 [accessed, 27/04/2018]. Early works on the Indian Ocean include, K.N. Chaudhuri, *Trade and Civilisation in the Indian Ocean: An Economic History from the Rise of Islam to 1750* (Cambridge, 1985), though the 'Atlantic World' is perhaps the most established of these research areas: see for example, Alison Games, "Atlantic History: Definitions, Challenges and Opportunities", *American Historical Review* 111, 3 (2006), pp. 741-57; Ian K. Steele, *The English Atlantic, 1675-1740: an Exploration of Communication and Community* (Oxford, 1986); Bernard Bailyn, *Atlantic History: Concept and Contours* (Cambridge, 2005).

[46] See, for example, on the East India Company, Emily Erikson, *Between Monopoly and Free Trade: The English East India Company, 1600-1757* (Oxford, 2014).

[47] Craig Muldrew, *The Economy of Obligation: The Culture of Credit and Social Relations in Early Modern Europe* (Basingstoke, 1998); Laurence Fontaine, *The Moral Economy: Poverty, Credit, and Trust in Early Modern Europe* (Cambridge, 2014).

interacted in neighbourhoods, kin groups or other bounded solidarities: it opens up the study of a wide range of relationships, wherever they were located and however they were structured.[48] In doing so, networks transcend the organising structures of early modern life that have often shaped understandings of historical communities. Networks also enable social relations to be viewed from multiple levels—what has been called 'scalable reading'—as communities can be viewed as a totality or through a narrower lens, which zooms in to consider the perspective of individuals and the characteristics of their relationships.[49] This, in turn, can help connect wider historical processes to the lives of the men and women who lived through them.

In all these respects, network analysis offers an approach that can help to describe and make sense of different forms of social organisation.[50] And, crucially, the techniques developed by social scientists offer a systematic means to do this. Concepts and calculations may sound alien, but they address the same phenomena that have long occupied historians.[51] Homophily, for example, is the principle that 'birds of a feather flock together' and it considers the extent to which shared attributes manifest in communities. This means that network studies are often concerned with issues of identity, whether class, nationality, age, gender or cultural values. Another concept, density, relates to the extent of cohesion within a given community, while 'structural holes' refer to those within a network who connect people who would otherwise be separated: the brokers, merchants or translators—the 'go-betweens'—that historians have studied.[52] The people who sustained networks, and directed information or materials across them, can also be identified by mathematical 'centrality' calculations.[53] One of these, 'betweenness', concerns the number of steps between any two people in a network: those who can be connected via relatively few steps to anyone else are thus structurally important. This tends to draw attention to the significance of couriers or servants in communities, rather than the higher profile figures they connected, a point with clear relevance to those concerned to write history from the 'bottom up'.[54]

These concepts and calculations are particularly amenable to visualisation, which has been part of social network analysis since Jacob Moreno's 'new approach' in the 1930s.

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[48] Barry Wellman and Charles Wetherell, "Social Network Analysis of Historical Communities: Some Questions from the Present for the Past", *History of the Family*, 1, 1 (1996), pp. 97-121, here p. 98.
[49] Ahnert and Ahnert, "Protestant Letter Networks", p. 3. The concept was originally used as a way to synthesise both 'close' and 'distant' reading of texts, see M. Mueller, "Scalable Reading", http://scalablereading.northwestern.edu/ [accessed, 22/07/2018].
[50] Wellman and Wetherell, "Social Network Analysis of Historical Communities", p. 98.
[51] The following concepts are discussed in Kadushin, *Understanding Social Networks*: on 'homophily', pp. 18-19, on density, pp. 29-31, and on the psychological foundations of networks, pp. 57-73.
[52] See for example Schaffer, Roberts, Raj, and Delbourgo eds, *The Brokered World: Go-Betweens and Global Intelligence*.
[53] Stephen P. Borgatti, "Centrality and Network Flow", *Social Networks* 27, 1 (2005), pp. 55-71.
[54] Ruth Ahnert and Stephen Ahnert use this calculation to highlight the importance of letter couriers in their article, "Protestant Letter Networks".

Several examples are discussed below, but for now visualizing the patterns described by network concepts can be illustrated using graphs from my own work. Figure 2 shows Ned Ward's network, plotted over the forty years he was active as a writer in London. [FIG 2. NEAR HERE] It was pieced together using data gathered from printed title pages and local records, which provided evidence for relationships between print industry workers and authors.[55] The visualisation shows the implications of a low overall density calculation (0.01), with different parts of the network being relatively unconnected. Ward is represented by the largest node in the centre: he connects the network's disparate parts and could thus be described as a 'structural hole'. So too could the individual on the right-hand side and also lightly shaded, Arthur Bettesworth (fl. 1699-1737), a prolific and successful bookseller who connects a large number of nodes to the network. There are three clusters visible (shaded darker) where relations are denser between certain individuals. One is a group of authors, of which Ward was part, and after further research it became clear they were an example of homophily in action: they had in common various attributes, including age, gender, political commitments, and a fondness for certain forms of tavern-based sociability.[56] A second cluster denotes the victuallers with whom Ward shared a street off Holborn, and a third—particularly difficult to discern from the data alone—revealed a group of collaborating booksellers, a characteristic of the industry that became a common protection against piracy after the lapse of press licensing laws but before copyright legislation. Figure 3 shows the network broken down into 10-year periods, and this indicates how Ward's contacts shifted over the course of his career. [FIG 3. NEAR HERE] This visualisation of change over time speaks to issues that concern most studies of early modern social relations, including life cycle and natural fluctuations in communities. In the case of Ward specifically, the changing size of his network highlights the intensity of his publishing activity: his connections with printers and booksellers multiplied as he became more prolific, before contracting again as he turned attention to his victualing career after 1712. And the appearance of more eminent

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[55] Edward 'Ned' Ward's publications and other print literature was identified using the English Short Title Catalogue [http://estc.bl.uk/] and electronic databases Early English Books Online [https://eebo.chadwyck.com/home] and Eighteenth-Century Collections Online [https://www.gale.com/uk/primary-sources/eighteenth-century-collections-online]. Additional local records included London Metropolitan Archives (LMA), Licensed Victuallers' Registers, MR/LV, and City Freedom Admission Papers, COL/CHD/FR/02; The National Archives (TNA), Wills and Probate, PROB 11, and State Papers Domestic Series, Criminal Journal Books, SP/44/77-80. Published primary sources pertaining the Stationers' Company included Ellic Howe, *A list of London Bookbinders 1648-1815* (London, 1950); D. McKenzie (ed.), *Stationers' Company Apprentices 1641-1700* (Oxford Bibliographical Society, n.s. XVII, 1974); Henry R. Plomer, *A Dictionary of the Printers and Booksellers who were at Work in England, Scotland and Ireland from 1668 to 1725* (Oxford Bibliographical Society, 1922); Henry R. Plomer, *A Dictionary of the Printers and Booksellers who were at Work in England, Scotland and Ireland from 1726 to 1775* (Oxford Bibliographical Society, 1932); and Alison Shell and Alison Emblow (eds), *Index to the Court Books of the Stationers' Company, 1679-1717* (Oxford, 2007).

[56] Kate Davison, "Occasional Politeness and Gentlemen's Laughter in 18th C England", *The Historical Journal*, 57, 4, (2014), pp. 921-45, here p. 942.

booksellers later in his career reflects his improving status as a writer: early on his most important bookseller was John How—a man of humble origins and means—but later Ward's works were routinely sold by Bettesworth, who ran two bookshops, took the Livery of the Stationers Company, and died a wealthy man having established a family bookselling business.[57] In all cases, further research into the individuals involved is necessary, but the example of Ward's networks illustrates the benefit of visualisation: it can accentuate the temporality of relationships and highlight patterns within the data; most importantly, it can allow us to *see* the characteristics of communities.

Beyond calculations and visualisation, there are other aspects of network analysis that speak to the interests of historians. The psychological foundations of networks have recently become a 'frontier' of research: what are the cognitive abilities and motivations that bring people together or drive them apart? Since it is not the networks that act, but the people within them, sociologists have begun to evaluate the importance of people's intellectual and emotional attributes for the composition of networks.[58] These insights offer new leads for the well-developed field of emotion history in particular, which has been concerned with the emotional underpinnings of certain communities.[59] Another recent development in network analysis familiar to historians is the use of prosopographical methods. Network analysts now commonly assert the importance of collecting biographical information on members of a network, as it allows deeper inferences to be drawn about the community than when the end goal is simply establishing relations.[60] It is also worth noting the sociological research into what flows through networks. Social scientists have found that networks influence anything from the dissemination of news and information, to the distribution of wealth, the spread of political ideas, the adoption of fashions, or even the degree of happiness experienced by an individual.[61] In this light, social networks could

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[57] On John How, see McKenzie, *Stationers' Company Apprentices* II, p. 73. On Arthur Bettesworth, see McKenzie, *Stationers' Company Apprentices* II, p. 5, and TNA, PROB 11/696/371, Will of Arthur Bettesworth, Stationer of London.

[58] Ronald S. Burt, Martin Kilduff and Stefano Tasselli, "Social Network Analysis: Foundations and Frontiers on Advantage", *Annual Review of Psychology*, 64 (2013), pp. 227-47.

[59] See for example Barbara H. Rosenwein, *Emotional Communities in the Early Middle Ages* (Ithaca NY, 2006); Barbara H. Rosenwein and Riccardo Cristiani, *What is the History of Emotions?* (Cambridge, 2018), pp. 39-45.

[60] See for example Christophe Verbruggen, "Literary Strategy During Flanders' Golden Decades: Combining Social Network Analysis and Prosopography", in K. S. B. Keats Rohan (ed.), *Prosopography Approaches and Applications: A Handbook* (Oxford, 2007) pp. 579-99. As a historical methodology, prosopography dates back to studies of antiquity conducted in the nineteenth century, but it broke into the mainstream in 1929 with Lewis Bernstein Namier's study of the eighteenth-century political elite in *The Structure of Politics at the Accession of George III* (S.I., 1929), and was thereafter adapted by social historians like the Rutmans and Wrightson and Levine.

[61] James H. Fowler and Nicholas A. Christakis, *Connected: The Amazing Power of Social Networks and how they Shape our Lives* (London, 2010); the authors' study of happiness was also published as "Dynamic Spread of Happiness in a Large Social Network: Longitudinal Analysis over 20 years in the Framingham Heart Study", *British Medical Journal*, 338, 7685 (2009), pp. 23-7. See also, Paul McLean, *Culture in Networks* (Cambridge, 2017), pp. 65-88.

enhance historical understanding of diverse phenomena by focusing attention on exactly how they are transmitted between individuals and groups.

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Given the crossover of interests, it is little wonder that the years since the Rutmans' study of the Chesapeake Bay have seen a steady increase in the use of network analysis in history. Amidst the variety of work in the field, two broad approaches have crystallised. The first can be characterised as a 'whole network' approach, and it begins with a given social system then seeks to find all relations within it. Historical sociologists are still the foremost practitioners and they often conduct their studies on a large scale, over a long period of time, and with quantitative methods. John Padgett's work on Renaissance Florence is a case in point. By collecting political, economic, and kinship information on 42,736 male and 12,875 female inhabitants between 1282 and 1500, he was able to build an argument for social mobility and the openness of the Florentine elites.[62] Taking a similarly wide-angle lens, Emily Erikson has explored the role of individuals and their connections in how institutions are formed, maintained and adapted over time in the context of the East India Company.[63] The concept of networks has long featured in studies of trading communities: the historian David Hancock drew inspiration from Mark Granovetter's 'Strength of Weak Ties', even if he did not apply network analysis directly.[64] More recently, however, there are those who have. Emily Buchnea used network visualisations to explain how transformations in the structures of personal contact helped to meet the demands of unstable long-distance trade between Liverpool and New York in the eighteenth-century.[65] Network methodologies also provide new ways to consider communities of which historians have long been aware. Ruth Ahnert and Sebastian Ahnert used computational methods alongside archival close reading to shed new light on underground Protestant letter networks in Marian England. Through network analysis they were able to identify the hitherto unappreciated importance of letter couriers and financial supporters to the survival of the community. Running centrality calculations on their data demonstrated that non-letter writers were as crucial to the overall network structure as the letter writers themselves, who have generally dominated historical attention. This points to the potential for historians to experiment with the mathematics underlying

[62] John Padgett, "Open Elite? Social Mobility, Marriage and Family in Florence, 1282-1494", *Renaissance Quarterly*, 63, 2 (2010), pp. 357-411. See also Darrett B. and Anita H. Rutman, *Middlesex County, Virginia 1650-1750*, (London, 1984); Peter S. Bearman, *Relations into Rhetorics: Local Elite Social Structure in Norfolk, England, 1540-1640* (New Brunswick, NJ, 1993).
[63] Erikson, *Between Monopoly and Free Trade.*
[64] David Hancock, *Oceans of Wine: Madeira and the Emergence of American Trade and Taste* (London, 2009).
[65] Emily Buchnea, "Transatlantic Transformations: Visualizing Change Over Time in the Liverpool-New York Trade Network, 1763-1733", *Enterprise and Society*, 15, 4 (2014), pp. 687-721.

network structures, and to represent it visually: in Figure 4 the 'structural holes' that connect disparate sections of the network are clear. [FIG 4. NEAR HERE] Just like Buchnea, the Ahnerts made a case for the value of network graphs: visualisation, they argued, is a 'powerful tool' that allows a community that existed 450 years ago to be 'literally mapped before our eyes'.[66] It allows for the kind of distant reading that allows us to appreciate the shape of networks and how they are sustained. Thus social network analysis can demonstrate quantitatively and visually suppositions that were previously left to intuition gained through source emersion.

The second key approach to emerge is known in the social sciences as 'ego-networks'. It starts with a single individual—the 'ego'—and then works outwards from him or her, seeking to recover as far as possible their social relationships in different spheres of activity. Doing so captures a personalised view of social relations. An ego-network can embrace the different kinds of relationships in which a single individual might be involved—whether friendly, hostile or a result of instrumental need, and whether sustained over time or fleeting. Ego-network analysts hold that these kinds of 'personal communities' are formed through a mixture of social structures and individual agency. Some relationships will be a result of working or residential patterns, but others will be formed through the different activities an individual chooses to pursue. These relationships also have implications for the individual's own life, as they facilitate, constrain and ultimately shape experiences and opportunities. As such, ego-networks provide a way to think about the different social roles that a single individual can fulfil and how they can move between them.[67]

Historians have long had a stake in analogous debates about the balance between individualism and community. In an early modern European context, this has often taken the form of questions about 'the self', whether such a consciousness came into being in this period, and how far individual lives were influenced by interactions with those around them.[68] As Keith Wrightson has put it, rising individualism once seemed to 'encapsulate much that was 'modern' about the 'early modern' period', but this position was shaken by social historians' community reconstructions. Relationships of 'mutualities and obligations' remained a fundamental part of life into the eighteenth century, and they had a bearing on an individual's sense of identity: they evoked a sense of personal identification through

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[66] Ahnert and Ahnert, "Protestant Letter Networks", pp. 5-7.
[67] The underlying principles of ego-network analysis are outlined in Barry Wellman, Peter J. Carrington, and Alan Hall, "Networks as Personal Communities", in Barry Wellman and S.D. Berkowitz (eds), *Social Structures: A Network Approach* (Cambridge, 1988), pp. 130-84.
[68] On the self, see notably Stephen Greenblatt, *Renaissance Self Fashioning: from More to Shakespeare* (London, 1980).

interaction with others in particular social or institutional contexts.[69] Such an approach remains faithful to contemporary perceptions, which held that a person's identity and experiences were shaped partly by their social relations. The English publisher John Dunton (1659-1732) represented this attitude in the preface to his autobiography:

> Here are very many CHARACTERS of Learned Great Men, with whom I have been concern'd; and indeed *my Life* and *my Affairs*, have been so closely interwoven, with those of other People, that there was no avoiding it … I cou'd not write *an Impartial History of my own Life*, without giving a *distinct Account* of every Person I have either known or corresponded with.[70]

As an approach, ego-network analysis changes the scale and aims of research and hence also the sources to be used. Whereas a 'whole network' study may isolate and analyse one type of relationship, an ego-network study seeks to capture the diverse and often discrete experiences of a single individual and therefore pursues their relationships through different sources. Borrowing these tools can help historians take stock of the many different relationships that shaped past lives. Shani D'Cruze, for example, used the methodology in her study of two gentlemen in eighteenth-century Colchester. By piecing together a variety of evidence from newspapers and local records, D'Cruze built a picture of their individual networks, which informed a discussion of citizenship. Countering its common association with freedom, D'Cruze emphasised instead that social position and active citizenship relied to a great degree upon dependence on others.[71] D'Cruze's essay is an early example of the use of network analysis in British historiography, but her approach bears striking resemblance to the vision for microhistory set out by Carlo Ginzburg and Carlo Poni in their 1979 essay, 'The Name and the Game'.[72] They proposed a study of individuals and communities using names as 'a guiding thread' to navigate through an array of sources, compiling a documentary series that would transcend time and space so that individuals could be traced through different contexts. Networks were to be an important part of the project: relationships would create 'a kind of closely woven web' into which the individual

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[69] Keith Wrightson, "Mutualities and obligations: changing social relationships in early modern England", *Proceedings of the British Academy*, 139 (2006), pp. 157-94, here p. 165. See also Richard Jenkins, *Social Identity* (4th edn., New York, 2014).

[70] John Dunton, *My Life and Errors* (London, 1705), preface. John Dunton's will also makes bequests to an unusually large number of individuals whom he knew in various capacities: TNA, PROB 11/657/318, see Helen Berry, "Crimes of Conscience: the last will and testament of John Dunton" in Robin Myers, Michael Harris and Giles Mandelbrote (eds), *Against the Law: Crime, Sharp Practice and the Control of Print* (London, 2004), pp.81-102.

[71] Shani D'Cruze, "The Middling Sort in Eighteenth-Century Colchester: Independence, Social Relations and the Community Broker", in Jonathan Barry and Christopher Brooks (eds), *The Middling Sort of People: Culture, Society and Politics in England, 1550-1800* (Basingstoke, 1994), pp. 181-207.

[72] Carlo Ginzburg and Carlo Poni, "Il Nome e il Come: Scambio Ineguale e Mercato Storiografico", *Quaderni Storici*, 40 (1979), pp. 181-90, trans. in Edward Muir and Guido Ruggiero, *Microhistory and the Lost peoples of Europe* (London, 1991), pp. 1-10.

was inserted. 'Bit by bit', they continued, 'a biography, albeit fragmentary, emerges from the network of relationships that circumscribe it'.[73] Again, network analysis is consistent with the aspirations of more traditional historical methods.

Microhistory has further synergies with network analysis. In Anglo-American scholarship, microhistory came to denote a focus on a small-scale narrative—a single individual or event seemingly insignificant to the grand sweep of history.[74] In this respect, microhistory was understood as part of the same scholarly trends that hatched the cultural turn: it reacted against the study of social structures in favour of recovering the agency, motives and consciousness of ordinary men and women who, it was held, made their own history.[75] In its original Italian conception, however, microhistory did not give up the big picture. Though Italian microhistorians did not exist as a coherent 'school', the fine-grained reading of the past they advocated was intended to provide answers to 'big questions'; that is, to interrogate the validity of established historical narratives. It was less about narrowing the scale than moving between scales: the implications of microhistory's findings should transcend the local contexts in which they were discovered.[76] This impetus to move between scales began to look especially useful as the shift towards global history became more pronounced and established a new set of large-scale theories and narratives to be tested.[77] This has led to the emergence of 'global microhistory'. The most common approach thus far has been biographical: studies of individuals whose lives traversed geographical units and embodied the kinds of cultural encounters that attract a global historical perspective.[78] But networks, too, can be used to this end. Emma Rothschild, for example, has integrated traditional methods of social history with network analysis to capture how an apparently

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[73] Ginzburg and Poni, "The Name and the Game", p. 7.

[74] Edward Muir, "Introduction: Observing Trifles" in Muir and Ruggiero, *Microhistory and the Lost peoples of Europe*, pp. vii-xxviii. Classic studies of an individual include Natalie Zemon Davis, *The Return of Martin Guerre* (London, 1983); and of particular events, Darnton, *The Great Cat Massacre*, see note 40 above. See also, Francesca Trivellato, "Microstoria/Microhistoire/Microhistory", *French Politics, Culture and Society*, 33, 1 (2015), pp. 122-34, here pp. 127-8.

[75] On this point, Anglo-American microhistory had much in common with the German *Alltagsgeschichte*, which emerged from a dissatisfaction with the German *Strukturgeschichte* that had favoured social scientific approaches to social history, see David F. Carew, "*Alltagsgeschichte*: A New Social History 'From Below'?", *Central European History*, 22, 3/4 (1989), pp. 394-407, here pp. 395-6.

[76] Francesca Trivellato, "Is There a Future for Italian Microhistory in the Age of Global History?", *California Italian Studies*, 2, 1 (2011), section II. The classic example is Carlo Ginzburg, *The Cheese and the Worms: the Cosmos of a Sixteenth-Century Miller*, trans. John and Anne Tedeschi (Baltimore, 1980), which used the depositions of a miller from the Fruili, Menocchio, to piece together a peasant worldview formed through the interaction of elite and traditional oral cultures.

[77] Trivellato, "Is There a Future for Italian Microhistory", section II. See also, Lara Putnam, "To Study Fragments/Whole: Micro-history and the Atlantic World", *Journal of Social History*, 39, 3 (2006), pp. 615-30.

[78] Tonio Andrade, "A Chinese Farmer, Two Black Boys, and a Warlord: Towards a Global Microhistory", *Journal of World History* 21, 4 (2011), pp. 573-91; John Paul Ghobrial, "The Secret Life of Elias of Babylon and the uses of Global Microhistory", *Past & Present*, 222, 1 (2014), pp. 51-93; Natalie Zemon Davis, *The Trickster Travels: A Sixteenth-Century Muslim between Worlds* (New York, 2006); Linda Colley, *The Ordeal of Elizabeth Marsh: A Woman in World History* (New York, 2007).

isolated and landlocked family in inland France was connected to a wider world of information and exchange. Parish, communal and notarial records are abundant in evidence of moments of exchange. Beginning with one such record—a marriage contract with an unusually large number of signatories—Rothschild identified 79 of the 83 undersigned through parish and tax records, then collated a further 221 people to whom they were connected in their local community and plotted the relations as a social network. [FIG 5. NEAR HERE] The visualisation (Figure 5) uses shading to show the dissemination of experience of the outside world: those shaded most deeply had travelled outside France, slightly lighter are those with a family member who had, and lighter still are those more loosely related to people with connections to the outside world. Though only one of the signatories had travelled outside France, the network displays how information about faraway business concerns could flow into rural French town via social networks. This combination of traditional social history and network analysis created an 'inductive' history: one that, as Rothschild described, 'moves from a history of individuals, through an inquiry into the individuals' own relationships, to a larger meso- or macrohistory'.[79] The economic life of the townspeople can thus be viewed from different perspectives: the family, the household and domestic economy, the economic life of the province, and finally through to the exterior of international commerce and trade. This is the 'scalable reading' advocated by both social network analysis and Italian microhistory.

Retracing the disciplinary developments that have encouraged early modern historians to use social network analysis is instructive: it shows that the uptake of network methods and concepts is driven by the need to confront the complex and fluid notion of social relations that has taken root, and not just by the concerns of our digital age. Moreover, it becomes clear that network analysis shares interests and aspirations with traditional historical methods and, bringing to two together creates opportunities to yield new understandings of past lives and communities: how people formed and maintained connections across geographical and institutional boundaries, and how the patterning of those relationships shaped wider historical changes or, on the smaller scale, the experiences of those involved. This is the benefit of borrowing methodologies from outside history. At the same time, it is worth recognising that social sciences have much to gain from historical perspectives. It is notable that the key questions said to drive social network analysis are often framed in universal terms: typical examples include 'how do groups form?', 'how can we best describe the way social positions relate to one another?', and 'what is the nature of

[79] Emma Rothschild, "Isolation and Economic Life in Eighteenth-Century France", *American Historical Review*, 119, 4 (2014), pp. 1055-82, here p. 1078.

community, and how are people related to one another?'.[80] In practice, the need for evidence forces particularity and studies have focused on specific times and places, but the aspiration for general conclusions remains. Historians can challenge this tendency towards universalism. Driven to uncover the particularities of time and place, they open up a whole range of human behaviour. This can enrich our understanding of networks more generally by emphasising that they are formed, maintained and fragmented differently over time, and with different results. Nevertheless, using network analysis in an historical context is far from straightforward. As the methodology becomes more prominent in the discipline, the call is growing louder to consider its limitations and challenges.[81] It is to these that the remainder of the article turns.

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An immediate problem with using network approaches follows from the above discussion: there is little agreement over what a network actually is or should be, as networks have been identified in many different contexts. Flexibility is part of the appeal but, without clarity in each case, there is a danger the concept becomes malleable to the point of vacuousness. Across the range of studies using networks, there is a distinction between those that adopt the concept for its metaphorical quality, and those that adhere more closely to theories developed in the social sciences, which have been the primary focus of this article. The limitations of applying formal network analysis in an historical context are attracting increasing attention and might be more immediately evident, especially when digital research methods and network visualisations feature so prominently, but potential pitfalls are often equally pertinent to the metaphorical use of networks.

In the first instance, networks have an implicit positive bias that needs acknowledging and mitigating. Not only is it more unusual to discover animosity in the sources used to construct networks, but also, by their very nature, network studies tend to emphasise the presence of contact between people, rather than its absence. This problem transcends many areas of research in which networks have featured, but it is well illustrated by work on early modern trade and commerce. In this field, networks have become a particular favourite; they serve as a powerful tool for historians seeking to explain long-distance cooperation and exchange in a world hindered by insecure communications and transport routes. By highlighting the role of historical actors, the linkages between them, and

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[80] Kadushin, *Understanding Social Networks*, p. 11. This tendency also noted in Innes, "'Networks' and British History", pp. 69-70.

[81] See, for example, David Hancock, "The Trouble with Networks: Managing the Scots' Early-Modern Madeira Trade", *The Business History Review*, vol. 79, 3 (2005), pp. 467-91.

the values underpinning those dealings, networks focus attention on the social and cultural conditions that supported trade—the personal connections and relationships of trust that spanned oceans to facilitate the movement of people and goods.[82] There were many such connections criss-crossing the Atlantic or the Cape-route to Asia—and they have their historical network analysts[83]—but identifying these networks focuses on success stories only and, hence, obscures the frequency of miscommunication, stuttering contact and botched journeys. As David Hancock has argued, this 'skews our understanding' of early modern trade by leaving untold a parallel story of problematic negotiations, failed shipments and rogue merchants.[84] For every prosperous overseas trading partnership, there were many more that faltered due to individual mistakes, lapses in judgement, and the numerous challenges resulting from distance and technological limitations.[85] The static nature of network visualisations also creates a false sense of stability that could be swiftly undermined by a range of factors, not least sudden death. This can be mitigated by using several visualisations to represent change over time, as exemplified by Figure 3, but even then network graphs are snapshots of an inherently unstable and uncertain reality. Attention to these kinds of complications in networks or outright failure is growing,[86] but it is still outweighed by a more optimistic tale of emerging national and global communications.

A related challenge comes with the need to avoid anachronism in imposing a modern understanding of society onto the past. As discussed above, 'social networks' are a twenty-first century fascination. They conjure a sense of smooth interpersonal connectivity that transcends political borders, language barriers and institutional affiliations. Aspects of modern society might be considered 'global' in this sense, but there were severe limitations to what has be called 'early modern globalization'. Communications could be precarious and, by modern standards, unimaginably slow.[87] While personal connections were undoubtedly important to the development of commerce, exploration and territorial expansion after 1500, the expectations and experiences of contemporaries were very different from our own. An awareness of the extent to which early modern networks were a story of obstacles as much as successes (if not more so) should allay the temptation to

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[82] Gestrich and Beerbuhl, *Cosmopolitan Networks*, pp. 1 and 9.
[83] See, for example, Buchnea, "Transatlantic transformations"; Breen, "No Man is an Island".
[84] Hancock, "The Trouble with Networks", p. 467.
[85] The failure of businesses and trading relationships has attracted less historical attention. On failure in business in an English context, see Julian Hoppit, *Risk and Failure English Business 1700-1800* (Cambridge, 1987).
[86] Sheryllynne Haggerty, "I could 'do for the Dickmans': when Family Networks don't Work", in Andreas Gestrich and Margrit Schulte Beerbühl, *Cosmopolitan Networks in Commerce and Society 1660-1914* (London, 2011), pp. 317-42.
[87] Jan De Vries, "The Limits of Globalization in the Early Modern World", *Economic History Review*, 63, 3 (2010), pp. 710-33; Ian K. Steele, "Time, Communications and Society: The English Atlantic, 1702", *Journal of American Studies*, 8, 1 (1974), pp. 1-21.

transpose modern smooth global communications onto the past. The same is true of power and status. A constellation of status hierarchies structured early modern societies, including gender, occupation, age, lineage, wealth, regional and national identities, some changeable and others fixed. The danger with a network perspective is that these different power relations, which would have been perceptible and meaningful to contemporaries, are flattened. Even with the sophistication of visualisation tools, it is not clear how to account for power effectively amidst the dots and lines. The images of Ned Ward's network above, for example, do not distinguish between high status printers running profitable business and those of a lowlier station, looking to make ends meet from selling cheap reprints, let alone differences of age, gender, marital status and so on. Nor do they account for geographic differences: connections between printers working in London and Dublin are smoothed over amidst the dots and lines, as are booksellers' arduous and risky journeys across the Atlantic.

The avoidance of anachronism is one facet of acknowledging the particularities of time, place and culture in which any given network was active, and how far they shape the kinds of relationships identified. Networks do not stand apart from culture; they are formed, maintained and broken with reference to norms and expectations. The need to embrace this in network analysis is a well-developed discussion in social sciences. More than two decades ago, Harrison White argued that networks are not just structures of social relationships; they are also structures of meaning since ties that bind people together are described through discursive forms.[88] Put simply, people tell stories about how they know one another, and they ascribe their relationships with particular meanings using culturally available resources. More recently, Paul McLean set out multiple intersections between networks and culture, arguing that networks are enabled and constrained by culture, but also that culture is shaped and diffused through social networks. There cannot be one without the other: they are 'necessarily integrated'. As he put it,

> Culture – in the form of language, practices, or ideas – and social structure – in the form of social networks – act as contexts for each other's development.[89]

This serves as a reminder that networks should not be conceived as abstracted social structures, and that links between people cannot simply be counted or displayed as lines on graphs. It is important not to invest purely in identifying and mapping relationships, but to ask questions about how they are sustained, how they change, and how they are inflected by contemporary identities, beliefs and practices—of which there might be several in any given

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[88] Harrison White, *Identity and Control: how Social Formations Emerge* (Princeton, 1992). See also, Mustafa Emirbayer and Jeff Goodwin, "Network Analysis, Culture and the Problem of Agency", *American Journal of Sociology*, 99, 6 (1994), pp. 1411-54 and Paul McLean, *Culture in Networks* (Cambridge, 2017), p. 50.
[89] McLean, *Culture in Networks*, p. 59

society.[90] Maintaining sensitivity to culture alongside network analysis is a challenge that becomes more acute in the case of transnational research projects. Chasing connections between people encourages work that cuts across traditional geographical boundaries, but this can come at the expense of deep knowledge of local environments. It fosters what Lara Putnam has called 'side-glancing': the digitisation of archives, library catalogues and published scholarship has routinized the acquisition of expertise outside research specialisms, but without travelling this expertise can be cursory.[91] It is possible to find connections between people that span oceans without leaving the office, but work is still needed to incorporate the culture in which those people lived and worked into the research.

The notion that culture is shaped by networks also requires reflection. Culture is not disembodied; it exists and is expressed through social interactions in particular times and places.[92] Network analysis is a rigorous and flexible tool to identify how ideas are disseminated, accepted and changed. A prominent example of this at work is Stanford's *Mapping the Republic of Letters* project. Along with digital data analysis, the project uses network visualisations to map correspondence patterns across Europe. But these techniques alone do not provide answers; instead they open up questions that might test previous assumptions. That Voltaire exchanged few letters with British correspondents, for example, suggests he may not have been as influenced by English philosophy as is generally believed, but the letters themselves still need to be analysed. As the team behind the project have recognised, the data visualisations are powerful tools but they do not, in themselves, provide the kind of qualitative analysis that can unravel historical problems.[93] Hence it remains important to push on the explanatory power of networks once they have been identified: how do they help us understand particular historical phenomena? This is equally applicable when networks are used metaphorically. Joanne M. Ferraro used 'networks' to recover the integration of prostitution into the early modern Venetian economy. Through social relationships sex workers found support, they gained expertise, and they developed reciprocal commercial relationships with clients, neighbours and shopkeepers. This allowed Ferraro to build an argument that accounts for the proliferation of prostitution, despite

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[90] Mustafa Emirbayer and Jeff Goodwin argued that actors find themselves within a 'cultural environment' that is marked by a 'rich plurality of cultural formations', giving the example of Medicean Florence where social relationships were informed by both civic republicanism as well as the popular idioms of the day. See Emirbayer and Goodwin, "Network Analysis, Culture and the Problem of Agency", p. 1441.
[91] Lara Putnam, "The Transnational and the Text-Searchable: Digitized Sources and the Shadows They Cast", *American Historical Review*, 121, 2 (2016), pp. 377-402, here p. 380.
[92] This is a key principle of McLean, *Culture in Networks*, chapter 3: "Basic Culture Concepts, with a Networks inflection", pp. 34-62.
[93] Edelstein, Findlen, Cesarani, Winterer and Coleman, "Historical Research in a Digital Age", p. 407, and on Voltaire, pp. 419-20.

growing moral and legal concerns.[94] Though different in scale and methods, both these examples demonstrate the necessity of combining the identification of networks with qualitative investigation to shed light on aspects of early modern culture.

Yet, there is a danger that employing networks to explain historical change can stray into determinism. The sociologist Peter S. Bearman used network analysis to confront a traditional question in English historiography around the causes of the mid-seventeenth-century Civil Wars. He argued that members of the gentry occupied the same structural position in networks, and thus found a shared purpose that transcended traditional local and kinship ties to provide the impetus for political change.[95] Bearman's work was a rigorous application of network theory with explanatory power, but it received a mixed reception among historians with a strong commitment to contingency and individual agency.[96] Investing too much in theory can steal the agency from past individuals and the moments they shared with one another; and in the process, their relationships reduced to a series of dots with connecting lines and emptied of their practical and emotional significance. The use of network analysis should not come at the expense of sensitivity to historical cultures and the decisions of individuals on which the discipline is founded.

So far this section has discussed issues that come to the fore once a network has been reconstructed. Before that stage is reached, however, there is the process of reconstruction itself, which entails various complications. There are many decisions to be made by the researcher about what to include or exclude. In the first instance, there is source selection: what to use and how to use it? Diaries reveal different types of relationships to records of economic transactions: compare, for example, Mark Philp's work on the intellectual networks contained in the diaries of William Godwin with the trade networks found by John Haggarty and Sheryllynne Haggarty among Liverpool merchants and businessmen. They differ in aims, scope, and results from using different source material. While Philp identified and focused on a relatively small group around Godwin that was important to his intellectual activity, the Haggartys found large networks, clustered around institutional memberships with connections in between.[97] With such a wide variety of possible social connections to consider, an important part of the story has to be the

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[94] See also, for example Joanne M. Ferraro, "Making a Living: The Sex Trade in Early Modern Venice", *American Historical Review*, 123, 1 (2018), pp. 30-59.
[95] Peter S. Bearman, *Relations into Rhetorics: Local Elite Social Structure in Norfolk, England, 1540-1640* (New Brunswick, 1993); see also, Peter S. Bearman, 'The Structure of Opportunity: Middle-Class Mobility in England, 1548-1689', *American Journal of Sociology* 98, 1 (1992), pp. 30-66.
[96] See, for example, the review by David Levine, "Review: *Relations into Rhetorics: Local Elite Social Structure in Norfolk, England, 1540-1640* by Peter S. Bearman", *Journal of Social History*, 28, 3 (1995), pp. 698-99.
[97] Mark Philp, *Godwin's Political Justice* (London, 1986), appendices; on the diaries as a whole, see www.godwindiary.bodleian.ox.ac.uk/index2.html [accessed 14/12/2016]; John Haggarty and Sheryllynne Haggarty, "The Life Cycle of a Metropolitan Business Network: Liverpool 1750-1810", *Explorations in Economic History*, 48 (2011), pp. 189-206.

precise nature of the 'connections' revealed by the chosen source material, and how they vary between different individuals and networks.

A further problem with sources is the extent to which they need to be turned into 'data' in order to construct a network. Extracting the necessary information about social relationships can result in a detachment from historical contexts. It can be difficult to maintain a sense of the source, its materiality, and the reasons and conditions of its creation and survival—all of which are important in determining its use for historians. This is particularly relevant in the case of projects exploiting big datasets, where the presence of quantitative trends can obscure the gaps, silences and ambiguities of the original source material.[98] The reliance on digitised sources is problematic in a broader sense too. There is growing awareness that sources swept up in the 'digitisation revolution' represent a small subset of material, and a particular one at that. Certain kinds of sources lend themselves more easily to digitisation: printed texts, for example, have been compiled into large digital databases.[99] Moreover, this digitisation of sources is bound up with financial and political circumstances, which tends to mean that those from the wealthier northern hemisphere are more likely to exist in digitised form. Hence they are more likely to be used now that digital searching is routine, and in the long-term this will affect the kinds of history being written.[100] Pre-existing datasets are also attractive to research projects using 'big data'; it is no coincidence that each of the three large-scale network projects mentioned at the beginning of this article are Eurocentric in focus. Blind spots in the digitisation of sources are not easily filled, but it is important to be critically aware that when using digital searches, we are fishing in a very particular sea.[101] Those conducting research into historical networks need to be aware not only of the power differentials in early modern societies, but also of those at play between researchers, archival repositories and institutions in the present, and how they shape the kinds of research being undertaken and its findings.

Source selection is an important part of the process of reconstructing historical networks, but it is just one part of the wider problem of delineating boundaries for a given project. A time frame needs to be set, as does the 'degree' of relationships to be investigated: should the study stop at first order relations or move on to the second order, that is, from 'friends' to 'friends of friends'? On the one hand, pursuing relations to the second order greatly enlarges the task at hand, especially if done systematically; on the other, it enables

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[98] This is an issue raised in Edelstein, Findlen, Cesarani, Winterer and Coleman, "Historical Research in a Digital Age", p. 419.
[99] Notably in the case of English texts, *Early English Books Online* https://eebo.chadwyck.com/home and *Eighteenth-Century Collection Online* https://www.gale.com/uk/primary-sources/eighteenth-century-collections-online [accessed 27/04/2018].
[100] Hitchcock, "Confronting the Digital".
[101] As Lara Putnam has emphasized in her article "The Transnational and the Text-Searchable", p. 389.

much more to be discerned from the evidence, since it becomes possible to discuss issues of density and interconnectivity in a community. As with many historical studies, the parameters will be shaped by available source material: the Ahnerts' analysis of Protestant letter networks, for example, relied on a finite collection of archival material. There are decisions at every juncture about what to show and how to classify what is found in the sources, but all the while there remains much that is undiscoverable. John and Sheryllynne Haggarty, for example, acknowledged the limits of findings gleaned from their records: 'we do not know what was said after the official meetings, in the Exchange, customs house or tavern'.[102] Thus a network visualisation can give an impression of completeness, which should not disguise the fact that other possible contacts will have been missed simply because of the source base.

There are, then, serious challenges and limitations associated with using network analysis in the past. If used uncritically, the reconstruction of a network can be superficial or, worse, misleading. There is an awareness in the social sciences that networks are a sharp picture distilled from a hazy reality,[103] and this is no less true in the work of historians. A high degree of methodological transparency can go some way to alleviating these problems; the decisions and processes that have informed the results need to be discussed so that the precise nature of the findings, and their limitations, are both clear. There is also a responsibility to provide qualitative depth to the analysis. In this respect, identifying a network can only ever be a starting point for a wider discussion of the characteristics and composition of a community and the personal connections of which it comprised. It is a means to an end rather than an end in itself. The end in question can be defined by the researcher but, if the limitations of historical network analysis are confronted and the approach is combined with a commitment to historicism, there are gains to be made.

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A final question lingers: is historians' turn to social networks just old wine in new bottles? A key goal of this article has been to temper the much-vaunted newness of network methods. Retracing scholarly antecedents guards against the dazzling effects of novel jargon and digital data visualisation, and it also recognises the fundamental contributions of previous generations of scholars. The rapid uptake of network approaches since the turn of the twenty-first century has undoubtedly been encouraged by present-day concerns, but it is also a response to disciplinary developments set in motion long before the onset of our own

[102] Haggarty and Haggarty, "The Life Cycle of a Metropolitan Business Network", p.191.
[103] Wellman, Carrington, and Hall, "Networks as Personal Communities", p. 137.

digital age. As an emphasis on the contingency and fluidity of social relations has taken hold, historians and social scientists alike have turned to 'networks' to describe and analyse various forms of interaction. Conceptualising social relations as networks, then, is neither entirely innovative, nor a clean break with the interests, goals and methods of traditional historiography. Yet, as examples discussed above demonstrate, the tools and technologies now on hand enable historical research that is qualitatively different from that which came before.

By looking first for 'linkages', as Barry Wellman put it in 1979,[104] the concept of networks frees community from spatial or institutional boundaries. This is a useful principle to think with, but network analysis is more than an abstract approach: it offers concrete methods that can be deployed in diverse fields of research and at any level of inquiry, ranging from the local to the global—and everything in between. This is true in at least three respects. First: visualisation. Images of networks can confirm suppositions once left to intuition, they can yield results unidentifiable through source analysis alone, or they can highlight patterns that generate new research questions, as findings from the *Mapping the Republic of Letters* project has shown.[105] Secondly, networks allow for 'scalable reading', whereby social relations are considered at different levels: from the network as a whole, to clusters of small groups within it, through to the perspective of individuals. This provides a framework to move between the 'big picture' and the qualitative underlying evidence, or from broad patterns of historical change to the actions of ordinary people. In the case of economic life in rural France, for example, Emma Rothschild's multi-level reading showed that local interactions were part of emerging patterns of global exchange.[106] Thirdly, network concepts, including 'homophily' and 'structural holes', or centrality calculations such as 'betweenness', direct attention to the particular characteristics of communities, how they were sustained or why they fell apart: the significance of couriers between Protestant correspondents in Marian England, for example, becomes clear using these methods.[107] Network analysis thus offers new techniques to investigate communities long familiar to historians, and—by transcending spatial and institutional boundaries—it also opens up the discovery of new communities, or patterns of social relations, imperceptible through traditional methods. Moreover, the conclusions drawn from studies of networks reach beyond identifying and analysing communities. The wider explanatory potential of social networks has been demonstrated by work on a host of specific historical questions: how prostitution could flourish in early modern Venice, how citizenship was formulated in

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[104] Wellman, "The Community Question", p. 1203.
[105] Edelstein, Findlen, Cerarani, Winterer and Coleman, "Historical Research in a Digital Age".
[106] Rothschild, "Isolation and Economic Life".
[107] Ahnert and Ahnert, "Protestant Letter Networks", esp. pp. 12-20.

eighteenth-century England, or how Enlightenment ideas were shared and discussed across Europe, to name a few examples from those discussed above.

Network analysis is thus a useful addition to the historian's toolkit. Nevertheless, it should remain a tool and not a template. It has been said that theories and methods drawn from social sciences cannot simply be 'applied' to the past, and the same is true of social network analysis.[108] It needs to be adapted by each researcher to serve best the particular historical questions being asked, the nature of the source material available, and the contours of time, place and culture. Maintaining this commitment to historicism not only results in better history, it also opens up a productive dialogue with social sciences. Rather than expertise travelling one way from social scientists to historians, there can be reciprocity: historians' efforts to recover social networks in the past emphasizes their cultural and temporal specificity. In doing so, we can bring new insights into wider debates about social networks in human society, and the methods most appropriate to study them.

[108] Burke, *History and Social Theory*, p. 188.