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The Digital Encyclopedia of British Sociability in the Long Eighteenth Century

Social Network Analysis

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Mots-clés

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Digital Humanities

Networks

Résumé

Social network analysis is an interdisciplinary digital humanities approach aimed at understanding how people are connected to one another. Digital tools have revolutionized access to archival materials. Network analysis tools enable historians to process historical metadata and generate increasingly large visualizations of social networks, making it possible to identify a network's central, influential, and best-connected members. While network analysis tools are limited to the information historians input—they cannot uncover new sources—digitally generated models can reveal previously unrecognized figures as critical actors within known networks and challenge prior knowledge about the importance of others.

Social Networks and Digital Humanities

In 2016, the historian Howard Hotson imagined how the seventeenth-century educational reformer Jan Amos Comenius would marvel at the 'highways of light' connecting twenty-first-century scholars on the internet.[1] Recalling his own feelings about the developing internet in the mid-1990s, Hotson describes it as not only an updated venue for the kinds of learned exchange that he himself studies but also a solution to the greatest problem facing scholars of early modern social networks: the very nature of epistolarity means that archival records are spread across distances. This can make it very difficult to find everything written by a particular author or on a particular subject. Hotson argues that digitization, systemized metadata, and online collaboration are necessary steps towards better understanding early modern social networks and the pages of correspondence they produced.

Hotson's prescription has proved correct. The last decade and a half have seen an explosion of digital resources and tools for historians, including several with particular value for historians of sociability. The process of digitizing records which is taking place across countless archives allows researchers to stretch their often-limited resources to peruse collections they might otherwise omit from their studies. Simultaneously, the development of online databases such as the Cultures of Knowledge Project's Early Modern Letters Online (EMLO) and the Gale suite of databases, which includes Early English Books Online (EEBO) and Eighteenth Century Collections Online (ECCO), make it possible to collate a body of information from several archives. As Hotson more recently writes alongside Dirk van Miert and Thomas Wallnig, databases grouped by period, format, or theme can explode historical research into social networks beyond the national traditions that previously defined it.[2] Historians of eighteenth-century English sociability now have unprecedented access to their English subjects' international correspondents and contacts as well as deeper insight into the national context.

Indeed, historical research in the digital age can bring us to point of information overload; as Ann Blair describes, for both early moderns and current readers there is a seemingly unending stream of material to digest and very little guidance on how to sort and categorize it.[3] Scholars of eighteenth-century sociability, particularly in its epistolary forms, may struggle with the volume of evidence that digital databases deliver to our screens. We are confronted with such vast amounts of evidence pointing to social connection, ranging from formal letters of introduction to gossipy exchanges between longtime friends, that it can be difficult to identify key themes, central players, and significant events. In the face of information overload, we may find ourselves deferring to a historiography based on research that simply could not take into account the amount of material we now can access at the push of a button.

Network Analysis

This is where digital network analysis tools can be helpful. Ruth Ahnert et al. describe network analysis as:

> a set of practices and discourses that sit at the interface of the natural sciences, humanities, social sciences, computer science, and design […] that has the potential to unite diverse disciplines through a shared understanding of complexity in our world – whether that complexity pertains to the nature of the interactions of proteins in gene-regulatory networks or to the network of textual variants that can reveal the lineage of a poem.4

In other words, digital network analysis is an inherently interdisciplinary technique that allows scholars to apply the work of network scientists, mathematicians, and computer scientists to their own research. Digital network analysis can help historians of sociability understand the contours of a particular social network by producing representations of the network and its members, mapping membership onto geographic space, charting developments in the network over time, etc. Application of these tools potentially leads to novel insights into how the network emerged, who its central figures were, and how far its membership was spread. As will be discussed later, network analysis tools can be applied to study many different social arrangements and are particularly valuable as a challenge to older ways of seeing networks.

Social network analysis is by no means a product of the so-called digital age. Network analysis is itself an eighteenth-century invention, traced back to Leonhard Euler's solution to the Seven Bridges of Königsberg problem (Ahnert & al. 5). Euler's insight—that we can understand the relationships between things by abstracting them into a series of nodes and edges and graphing them—is foundational to network analysis as it has been adopted as a tool across disciplines. Dan Edelstein et al. see the beginning of modern network analysis in the 1960s and 70s when what they term the 'new social history' was in its infancy and when historians were also becoming increasingly aware of quantitative methods as possible avenues for analysis.5 They characterize this as a period when the ambitions of the discipline were expanding to encompass longer temporal durations, larger groups of people, and more data points (Edelstein & al. 401). According to them, it is the beginning of big data history, although the techniques historians employ have shifted dramatically as the internet has facilitated digitization and both online tools and software have improved. For contemporary historians, Edelstein et al. define the term big data as 'what you get when those shelves of books have been digitized, structured, and interlinked in such a way that the information contained within them can be filtered, plotted, measured, parsed, and visualized' (Edelstein & al. 402). A social network visualization reduces an entire human life to a point on a chart and

defines it by its connection to other nodes symbolizing other human lives and simultaneously makes it possible to understand the influence, reach, and interconnection of that individual as it traces their connections and the spread of their ideas. This is big data history.

Methods and Available Technologies

Metadata are the foundation of digital humanities methodology. Taken literally, the term metadata refers to data about data. For historians using digital tools, metadata can encompass the names of senders or recipients, locations, dates, keywords, and much more. The availability of metadata is deeply intertwined with digitization processes. Hotson's 2016 article describes the 1990s as time of rapidly-expanding availability of early modern primary texts that was not always attended by a simultaneous effort to standardize metadata and make them searchable (Hotson 75). In *Reassembling the Republic of Letters*, the question of metadata is central, as its many contributors grapple with standardizing ways of referring to people, dates, and places in an early modern world that saw shifting borders, calendrical reform, and a proliferation of pseudonymous and anonymous authors. The work of standardizing that metadata is an enormous undertaking by librarians, researchers, and computer scientists, and once again reveals the necessity of interdisciplinarity in network analysis projects.

Once a researcher has collected relevant metadata, there are several ways in which they could process it. The expansion of digital humanities research has been both the impetus and product of expanding network analysis tools, which means that historians of sociability exploring network analysis are faced with many options. Those options only multiply when we consider the potential of every researcher to learn code and build their own tool, but it is worth highlighting a few of the most commonly used systems and how they can be of particular value for historians of sociability.

Currently, Gephi is perhaps the most popular tool for network analysis and visualization. It is open-source and features a library of tutorials and demonstrations on its website, including some by and for historians.[6] Gephi visualizes data as a graph and a table in different tabs that users toggle between. Once generated from a comma separated values (.csv) file, a visualization can be manipulated—colour-coded, shaped, expanded, contracted—so that researchers can quite literally get a good look at how their subjects connect. While Gephi is not always the most intuitive tool for novices, it is highly flexible and can produce powerful, explanatory images.

Palladio was built at Stanford under the auspices of an NEH grant. It was used to produce visualizations for the renowned 'Mapping the Republic of Letters Project', which is considered a cornerstone of digital humanities and social network analysis.[7] Palladio allows users to visualize their data as a graph, geographic map, table, or gallery. Researchers can

switch between modes and can use colour-coding and sizing to emphasize the most important nodes in the network. For historians of eighteenth-century sociability, Palladio makes it possible to visualize not only the who's who of a given network but also their geographic locations. Compared with Gephi, Palladio is clearly geared to the work of historians but offers less of a community for troubleshooting and tutorials.

While Palladio was first and foremost designed for social network analysis, i.e., visualizing how people relate to one another via the evidence left in archives, Gephi was not. Gephi users may examine such diverse topics as zoonotic viral transmission, hashtag use on Twitter, and the circulation of best-selling novels. Moreover, not all network analysis requires visualization as a graph. Dan Edelstein, Robert Morrissey, and Glenn Roe used data mining technology to generate n-grams that identify re-used and uncited text in the *Encyclopédie*.[8] That the Encyclopédistes adapted and lifted text from other sources is well-known. What Edelstein, Morrissey, and Roe uncover is the strategic nature of that 'borrowing': subversive and controversial works were not cited by name, but their texts still made it into the *Encyclopédie* (Edelstein, Morrissey and Roe 225). Morrissey and Roe expanded on their research into the *Encyclopédie*, collaborating with Clovis Gladstone and Charles Cooney on a project that employed machine learning and algorithmic search tools to model how the articles within the *Encyclopédie* relate to one another.[9]

Benefits and Limitations

All of these projects sound terribly impressive and require significant labour and technological capacity. Do they actually produce anything worth studying? Skeptics of these projects suggest that the visualizations historians generate do not rise beyond the level of attractive, colourful illustrations. They argue that digital network analysis is not able to uncover new information or hint at new directions for research. In this regard, they have a point: a researcher can only analyze evidence they are aware of and can access. Even the most sophisticated network analysis tools can only represent information that a researcher has provided. While Hotson et al. imagine that there must surely be evidence of a Black Republic of Letters and a queer Republic of Letters, they must ultimately concede that network analysis tools cannot uncover them and that digital studies of these communities will only become possible once their contours are understood in analog archives (Hotson and Wallnig 31). Network analysis tools are not archival search engines; they cannot show us relationships or exchanges that we did not previously know about.

What network analysis can do is provide new insight into known communities. By taking the step into abstract representation, we can sometimes see the network and its most important nodes more clearly. For example, the 'Mapping the Republic of Letters Project' found information that challenged or complicated older histories of the Enlightenment and its most renowned figures. Project members Caroline Winterer and Claire Arcenas determined, for instance, that Benjamin Franklin's European network of correspondence only developed once

he moved to London and remained overwhelmingly Anglo-American despite his fame across the continent (Edelstein & al. 406–407). The idea of Franklin as an international Enlightenment figure may need revision in light of the fact that his intellectual world restricted itself to the Anglo-Atlantic. Similarly, Dan Edelstein and Biliana Kassabova have demonstrated that Voltaire, remembered by historians as a committed anglophile, had very few English correspondents during his lifetime (Edelstein & al. 407).They attribute this to Voltaire's nostalgia for the Restoration, a period that had passed by his own lifetime, and his comparative disinterest for contemporary English affairs (Edelstein & al. 207).

Another critique of network analysis is that it encourages reliance on metadata at the expense of data. For example, scholars of epistolary sociability may fixate on the names of senders and recipients, the locations of addresses, etc. and may elide the actual content of the letters they study, when it is the letters themselves that provide the best evidence of social connection and interaction. This is again a valid critique. However, it is possible to take content into account when digitally modelling networks. Evan Bourke's study of female involvement in the Hartlib Network analyzed not only the (relatively few) letters among the Hartlib Papers written by female authors but read the archive more broadly to find instances where women were acknowledged as actors within the network. He finds plenty of examples where letter recipients are asked to pass the sender's well-wishes on to women in the circle, where women are mentioned as face-to-face interlocutors, or where women are thanked for financial assistance to the sender.[10] Bourke's inclusion of close reading techniques alongside metadata analysis makes it possible for him to argue that women were in fact far more central to the functioning of the Hartlib Network than prior scholarship has acknowledged. In this way, digital network analysis can challenge existing historiography.

Ethical Concerns

Ruth Ahnert et al. point out that scholarly interest in network analysis began in earnest with the publication of works such as Albert-László Barabási's *Linked* (2002), which argued for the utility of network science in everything from neural mapping to counter-intelligence operations. While Ahnert et al. argue that scholars of the humanities should engage with network analysis tools, they also contend that what they call the 'network turn' is not separable from the twenty-first century war on terror and growth of the security state (Ahnert & al. 101). Ahnert makes this even more explicit in an article co-authored with Sebastian E. Ahnert, in which she examines the metadata of the Tudor State papers to determine patterns in communications. By examining exchanges that do not conform to established patterns, they are able to reliably uncover illicit trade and underground dissident networks.[11] This is a pointed demonstration of how much can be gleaned by merely examining metadata. They also reveal that the process of network analysis, much like state surveillance, is predicated on the collection and categorization of metadata. For Ahnert and Ahnert, this does not constitute a reason to stop performing network analysis on historical subjects. Indeed, the privacy concerns inherent to state surveillance do not apply nearly as strongly to eighteenth-century research. It is very difficult to embarrass or violate the privacy of a long-dead person.

Nonetheless, historians must understand that digital network analysis tools are not innately good or beneficial. Their impact depends entirely on how we use them.

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