

Nodes, Ties, and Theories

Some Considerations on the Correlation between Historical Network Models and the Social Complexity of the Medieval Past

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Abstract. In the last twenty years, the number of studies applying historical network analysis has grown significantly, in part due to the general “boom” in the digital humanities (although network analysis pre-dates the “digital turn”). Yet how can manifold social interactions be modelled as ties and individuals as nodes in a network for the purpose of quantitative analysis? Many historians approach network analysis in the face of significant amounts of digital data primarily from a quantitative perspective, trying to master the concepts, the mathematics, and the software. But one may ask, how can we perceive the actual correlations between network models and graphs and the social realities of the past? The paper presents some theoretical frameworks for this purpose. First, it examines three of the most elaborate concepts in “relational sociology” by Harrison C. White, Bruno Latour, and Niklas Luhmann. Second, it concentrates on attempts to combine Luhmann’s systems theory with network theory, and some implications for historical medieval network analysis are suggested. Finally, the main points are summed up.

Keywords: historical network analysis, relational sociology, systems theory, late medieval history, social history

The relatively large amount of source evidence for well-documented individuals from the Late Middle Ages allows for the creation of quite impressive network models. Heinicker’s article consistently uses the form Eitzing (ca. 1395–1460). He was a nobleman in the service of the Habsburg dukes of Austria and initiator of the so-called “Mailberger Bund,” an alliance of aristocrats and representatives of the estates of Lower and Upper Austria established in October 1451 to enforce the release of Ladislaus Postumus, heir to the thrones of Bohemia and Hungary, from the tutelage of King Frederick III. The high density of information in these graphs may even make them hard to “decipher” (Figure 1).¹

1 For a state-of-the-art overview and introduction to historical network analysis in medieval studies, see now Hammond, *Social Network Analysis and Medieval History*. For an earlier

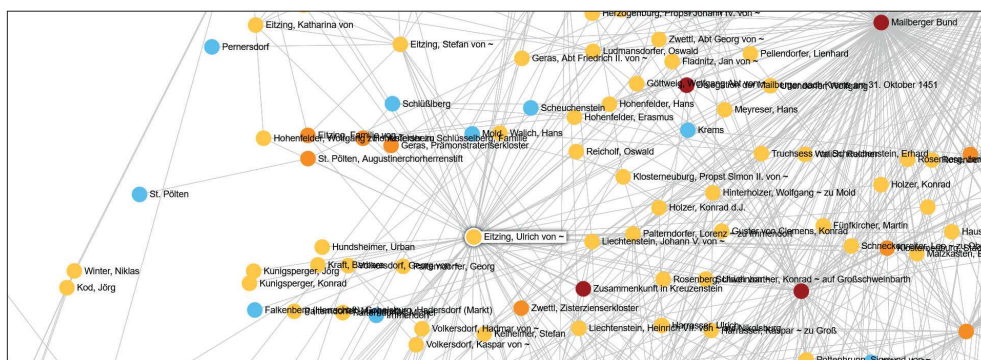


Figure 1 Extract from the network graph for Ulrich von Eyczing and the Mailberger Bund of 1451 (data: Petra Heinicker; visualisation from <https://frontend-demo.openatlas.eu/en/visualization?mode=network>)

Thus, it may be useful to resort to the network of a much less prominent individual from a less well-documented corner of late medieval Europe. In a Byzantine tax register of dues from the village of Radolibos in Macedonia for the Athos monastery of Iviron from the year 1316, we find the following entry:

“The priest Basileios Aroules has [a woman] Helene, a son, the priest Konstantinos, from him a daughter-in-law Anna, another son Chalkos, a daughter Maria, from her a son-in-law Ioannes, one house, one ox, a vineyard of nine modioi; the total tax amount is two hyperpyra. Ioannes, the shoemaker, his son, has [a woman] Zoë, the sons Daniel and Basileios, a house, a vineyard of three modioi; the total tax amount is one hyperpyron. Michael, the shoemaker, his other son, has [a woman] Eirene, a daughter Anna, a house, a vineyard of three modioi; the total tax amount is one hyperpyron.”²

In this and other document(s), we find further hints at ties which connected the village priest Basileios Aroules with members of his family as well as with members of his parish and the village. Equally, connections with the local bishop (his superior), the representatives of the monastery of Iviron (as the lord of the manor) and the local officials of the state (who composed the register of dues) can be identified. If we put his information into a network graph, with individuals as nodes and their connections and interactions as links (Figure 2), one could imagine that through the mediation of these more prominent actors, Basileios Aroules was —hypothetically— even linked with the highest authorities of the Patriarch and the Emperor in Constantinople.³

overview, see Jullien, “Netzwerkanalyse in der Mediävistik.” For an exhaustive bibliography, see <https://historicalnetworkresearch.org/bibliography/>.

2 *Actes d’Iviron* III, ed. Lefort et al., 74, lns. 69–71 (original text in Greek).

3 On elite networks in the same period, see Gaul, “All the Emperor’s Men.”

But does this network graph correlate with the social reality of Basileios Aroules? While interaction with the fiscal officials was a relatively singular event in the course of the year, day-to-day interaction between neighbours and friends, and between priest and congregation within the village of Radolibos, was definitely a more prominent part of the social life of Basileios. Yet, this was of no interest to the officials preparing the list of dues, who reduced the social reality of the village to taxable family units. As with many aspects of past realities, much of the social life of Radolibos remains below the “threshold of literacy” and is therefore more or less inaccessible to us.⁴

But on an even more basic level: how can manifold social interactions be modelled as ties and individuals as nodes in a network for the purpose of quantitative analysis? The network graph for Basileios Aroules—in comparison with the one for Ulrich von Eyczing, for instance—appears relatively simple. However, does it not somehow disguise a social reality which was much more complex? Many historians approach the network analysis of significant quantities of prosopographical data from a quantitative perspective, trying to master the concepts, the mathematics, and the software.⁵ But one may ask, how can we perceive the actual correlations between network models and graphs and social realities of the past?⁶

The present paper introduces some theoretical frameworks for this purpose; first, it takes a look at three of the most elaborate concepts of “relational sociology” by Harrison C. White, Bruno Latour and Niklas Luhmann. Second, it concentrates on attempts to combine Luhmann’s systems theory with network theory, and some implications for historical medieval network analysis are suggested.⁷ Finally, the main points are summed up.

4 Cp. also Macfarlane, *Reconstructing Historical Communities*. For networks of women in the Middle Ages see Berat, Hardie, and Dumitrescu, *Relations of Power*; Rose, “Autour de la reine Emma,” or Preiser-Kapeller, “Mapping Networks of Women.”

5 Cp. for an overview of the theoretical foundations of historical network analysis Reinhard, *Freunde und Kreaturen*; Erickson, “Social Networks and History;” Gould, “Uses of Network Tools;” Lemercier, “Analyse de réseaux et histoire;” Düring, Eumann, Stark, and Von Keyserlingk, *Handbuch Historische Netzwerkforschung*. For the challenges of the historical interpretation of quantitative results in network analysis, see, for instance, Düring, “How Reliable are Centrality Measures,” and Valeriola, “Can Historians Trust Centrality.” On the challenge of ‘big data’ in history, see Graham, Milligan, and Weingart, *Exploring Big Historical Data*.

6 Cp. also Bommers and Tacke, “Das Allgemeine und das Besondere,” and Laux, “Bruno Latour meets Harrison C. White,” 369, on deficits of theory in network research.

7 Cp. also Holzer and Schmidt, “Theorie der Netzwerke,” 231; Hertner, “Netzwerkkonzept.”

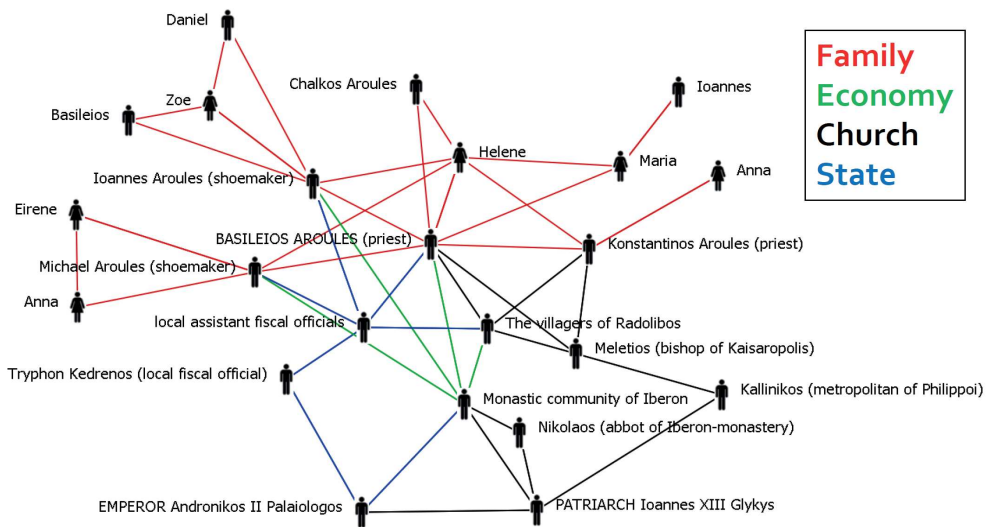


Figure 2 The (fragmentary) network of the village priest Basileios Aroules, 1316
(image created by J. Preiser-Kapeller)

Ties create nodes: Harrison C. White, Bruno Latour, Niklas Luhmann

Harrison C. White's "relational sociology" or "relational constructivism"⁸

Maybe the best-known theoretician among network analysts in the English-speaking world (and beyond) is Harrison C. White (1930–2024), with his concept of "relational sociology." White stated: "[N]etworks are phenomenological realities as well as measurement constructs."⁹ He understood social networks as "socio-cultural formations." For White, actors do not appear simply as embedded in social networks. Their cognitions and behaviours, their identity as actors, and the attribution of actions are the results of trans-personal transaction processes within networks.

Important units of analysis in White's terminology are "identity," "control," and "network domains" ("netdoms"). Identities arise from efforts to support and position oneself ("control") alone and in interaction with other identities. By positioning an identity, other identities aspiring for footing can place themselves in relation to it. In this way, the control efforts of an identity then create a social reality for others, who ascribe meaning to these efforts and thus to their own identity. The control projects of

8 White, *Identity and Control*. Cp. also Holzer and Schmidt, "Theorie der Netzwerke," 236; Fuhse, "Die kommunikative Konstruktion," 290–93; Laux, "Bruno Latour meets Harrison C. White;" Mützel and Fuhse, "Einleitung;" Holzer, *Netzwerke*, 79–93.

9 White, *Identity and Control*, 36; cp. also Fuhse, "Die kommunikative Konstruktion," 288; Mützel and Fuhse, "Einleitung," 12–13.

identities thereby result in discursive interactions that in turn generate meanings. In this way, identities are not only linked to each other, but are defined and constructed on the social level (only) through and within these links. Meanings are attributed to these links, and meanings coalesce into stories. These stories, in turn, construct the identities of actors participating in the respective context. The control efforts of identities take place between and within network domains (“netdoms”), which are simultaneously “interweavements” and condensations of topics and relationships. Identities “switch” between “netdoms,” whereby different “registers of language” can also be used.¹⁰ In this meshwork of structure and culture, identities meet other identities, and networks emerge: ties create nodes, and nodes create ties.¹¹

As will become evident below, there are several connections between White’s theories and those of Niklas Luhmann. White also drew on Luhmann in his work, especially in the second edition of his classic monograph *Identity and Control* (2008).¹² In 2005, White was the first Niklas Luhmann Visiting Professor at the University of Bielefeld.¹³

Bruno Latour and Actor-Network Theory¹⁴

Bruno Latour (1947–2022) and other proponents of Actor-Network Theory (such as Michel Callon [1945–2025] and John Law [1945–]) assumed that relations are simultaneously material and semiotic. Thus, their theory had particular appeal to archaeologists using network analysis.¹⁵ In Actor-Network Theory, animated and inanimate entities and concepts can “act” and come together to form a consistent ensemble of persons, concepts,¹⁶ and things. Again, these actors do not exist a priori, but are generated in the process of “networking.” A presenter, the audience in a room, the room and its inanimate contents, such as the laptop, the beamer and the screen, together with the concept of “presentation” assemble for the purpose of a presentation and emerge in their respective identity (as “presenter,” “moderator” or “audience”) within this network. Such networks exist in a constant making and re-making. Relations are repeatedly “performed”—or the network will dissolve. This symmetric approach to human and non-human “actors” is

10 White and Godart, “Relational Language.” Cp. also Mützel and Fuhse, “Einleitung,” 14–15; Fuhse, “Zu einer relationalen Ungleichheitssoziologie,” 198.

11 Cp. also Holzer and Schmidt, “Theorie der Netzwerke,” 234; Fuchs, “The Behavior of Cultural Networks,” 346.

12 White, *Identity and Control*; cp. also Fuhse, “Die kommunikative Konstruktion,” 294; Laux, “Bruno Latour meets Harrison C. White,” 368–69; Mützel and Fuhse, “Einleitung,” 15.

13 Mützel and Fuhse, “Einleitung,” 20.

14 Latour, *Eine neue Soziologie*; Laux, “Bruno Latour meets Harrison C. White;” Mützel and Fuhse, “Einleitung,” 22; Peuker, “Akteur-Netzwerk Theorie.”

15 Knappett, *An Archaeology of Interaction*.

16 Cp. also Fuchs, “The Behavior of Cultural Networks.”

otherwise not followed in relational sociology and systems theory, where only humans, as well as collective and corporate actors, can tell stories and attribute meaning to things and thereby “act.” A very interesting attempt to combine Latour and White (and Luhmann), however, was undertaken by Henning Laux in 2009.¹⁷

Niklas Luhmann: “Society does not consist of human bodies and brains. It is simply a network of communications”

Niklas Luhmann (1927–1998) created an immense corpus of studies of thousands of pages, many published posthumously.¹⁸ His “theory of social systems” has influenced a generation of sociologists (as well as historians¹⁹) in Germany as well as in other countries until today, although his reception has been less extensive outside the German-speaking scholarship.²⁰ This may be due to his language. Luhmann himself claimed he was deliberately keeping his prose enigmatic to prevent it from being understood “too quickly,” which would only produce simplistic misunderstandings. Therefore, a mass of secondary literature has been written in order to make Luhmann’s work more accessible. Some of his core theses can be summed up as follows:²¹

“Society is a system. Also, the economy, politics, mass media, family, all social contacts, etc., are systems. Systems operate in difference from their (social, material, etc.) environment. This difference is, in turn, constructed within the system. Systems are »autopoietic« and reproduce themselves.²² Social systems consist of »communications«. All social systems only constitute themselves through communications; there exists no other social mode of operation. It is not humans, but only social systems that can communicate. Human consciousness is a precondition for communication, but not part of social systems. Communications are only attributed to persons, who are colloquially identified as “participants of communication.”²³

17 Laux, “Bruno Latour meets Harrison C. White.”

18 Luhmann, *Wirtschaft*; Luhmann, “Interaktion in Oberschichten;” Luhmann, *Gesellschaft*; Luhmann, *Politik*; Luhmann, *Religion*.

19 Becker, *Geschichte und Systemtheorie*; Becker and Reinhardt-Becker, *Systemtheorie*. For most recent examples of applying systems theory on (ancient) history, see the contributions in Winterling, *Systemtheorie und antike Gesellschaft*.

20 Also in the overview by Mische, “Relational Sociology,” Luhmann is not mentioned.

21 Cp. for the following Baraldi, Corsi, and Esposito, *GLU*; Krieger, *Einführung*; Kneer and Nassehi, *Niklas Luhmanns Theorie*; Becker and Reinhardt-Becker, *Systemtheorie*; Berghaus, *Luhmann leicht gemacht*. Cp. also Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive.”

22 Baraldi, Corsi, and Esposito, *GLU*, 195–99.

23 Baraldi, Corsi, and Esposito, *GLU*, 89–93.

Communication connects to earlier communication; thereby, a social system reproduces itself. Possible is only “the reproduction of communication from results of communication.” Communication is a selection process within the space of possibilities limited by “sense,” which is defined in communication. This selection has three aspects: selection of information, selection of message and selection of understanding. Each of these selections is completely contingent and also possible in other ways.²⁴

Media (language; “media of proliferation,” such as writing, printing, electronic media) limit the range of possible selections (for instance, through the vocabulary and grammar of a specific language). However, they also stimulate new possibilities of selection within these limits.²⁵ In modern society, several differentiated communication systems have emerged, such as politics, economy and religion. “Symbolically generalised media” of communication are created for specific fields and special problems such as property/money, power/law, or religious belief. They condition communication in a sense that they guarantee the acceptance of a selection proposal by establishing a binary code (“have/have not” resp. “payment/no payment,” for instance).²⁶

A system is defined by a boundary between itself and its environment, dividing it from an infinitely complex exterior. The interior of the system is thus a zone of reduced complexity: communication within a system operates by selecting only a limited amount of all information available from “outside.”²⁷ The environment or another system does not directly affect a system, but only produces “resonances.” These are again selectively transformed in their communications following their specific code, thereby reducing complexity as well as allowing an increase in complexity within the respective system.²⁸

Systems theory and network theory²⁹

The emergence of relationships and identities

In the last twenty years, several collections of papers have been published with the purpose of combining systems theory and network theory. Some of these

24 Cp. also Fuhse, “Die kommunikative Konstruktion,” 295.

25 Baraldi, Corsi, and Esposito, *GLU*, 199–202.

26 Baraldi, Corsi, and Esposito, *GLU*, 189–95. Cp. also Tacke, “Differenzierung” 250; Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive,” 319.

27 Cp. also Holzer, “Von der Beziehung zum System,” 98.

28 Baraldi, Corsi, and Esposito, *GLU*, 93–97.

29 Cp. for the following esp. Bommers and Tacke, “Das Allgemeine und das Besondere;” Fuhse, “Die kommunikative Konstruktion;” Tacke, “Differenzierung;” Mützel and Fuhse, “Einleitung,” 2010; Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive;” Holzer, *Netzwerke*, 93–104; Holzer, “Von der Beziehung zum System;” Holzer, “Differenzierung.”

studies have also attempted a synthesis of Harrison White's relational sociology with Luhmann's theories (as White himself has also done), and more rarely of Actor-Network Theory, White and Luhmann.

As for White, in Luhmann's systems theory, "persons" are constructs of communication for the purpose of communication. They only emerge in the process of communication. We find several termini in recent studies: "person," "actor," "identity," and "social address." Common is the supposition that they are

"[...] an artefact of attribution, created in communication for communication, a more or less elaborate profile of characteristics and behaviours, with which the personalised other is identified and provided with in the communication and with which communication operates as supposition [...] Addresses attain an individual profile of inclusion and exclusion. This refers back to stories and carriers of participation in differentiated systemic contexts and anticipates [...] horizons of relevance for future communication."³⁰

"Persons" or "identities" thus emerge in the process of communication and only gain a profile by their embedding in a web of communications. Thereby, they are also created as points of contact for further communication and sources of actions, motives and intentions. "Thus, a network consists of interconnected relationships, not of interconnected people."³¹ "Relationships," in turn, emerge based on a "history" of episodes of interaction and communication, thereby also defining the horizon of expectation for further interaction and communication. Relationships provide the context and relevant social environment to classify a particular future interaction situation.³² For specific relationships, specific cultural terms (such as "friendship" or "allegiance") emerge—which in turn influence the perception of and expectations for such a relationship.³³

In order to make this framework useful for historical network theory, we propose a connection with a categorisation developed by Wolfgang Reinhard, a pioneer of historical network analysis in Germany. In his book *Lebensformen Europas*, Reinhard identified, on the one hand, "ascribed" forms of relationship, which are attributed to a dyad of two persons "congenitally": for instance, consanguinity or

30 Bommers and Tacke, "Das Allgemeine und das Besondere," 31–32. Cp. also Fuhse, "Die kommunikative Konstruktion," 297–98; Holzer and Fuhse, "Netzwerke aus systemtheoretischer Perspektive," 314–15.

31 Cp. also Holzer and Schmidt, "Theorie der Netzwerke," 238; Fuhse, "Die kommunikative Konstruktion," 292, 295–97.

32 Fuhse, "Die kommunikative Konstruktion," 289, 297; Holzer, "Von der Beziehung zum System," 102–05.

33 Fuhse, "Die kommunikative Konstruktion," 302; Bommers and Tacke, "Das Allgemeine und das Besondere," 41–43; Holzer, "Von der Beziehung zum System," 101–02, 112–13.

origin from the same region. On the other hand, he observed relationships with a specific horizon of expectation acquired through acts of interaction or communication, such as spiritual kinship, godparenthood, relationship by marriage, membership in an organisation, patronage-clientele relationship, or friendship.³⁴

In terms of systems theory, such relationships “pre-structure” communication and interaction and thus reduce the uncertainty and “contingency” of communication. Thus, relationships as well as identities—or in network analytical terms, ties and nodes—emerge from the network of communications. In this regard, a social network is always more than its single parts—it is always a “complex” network, “an emergent level of social reality.”³⁵

If one applies these concepts to the above-presented network of the Byzantine village priest Basileios Aroules, it is possible to identify further important aspects despite its fragmentary character and small scale: the identities of the husband, father, father-in-law, grandfather and head of the household emerge within a web of ascribed and attributed relationships of kinship and relationships acquired through intermarriage, which imply frequent, day-to-day interaction.³⁶ But a more peculiar aspect of Aroules’ identity can be connected to one relationship of less frequent character, or even more to one single interaction episode: his ordination to the priesthood by and subordination to the local bishop, Meletios of Kaisaropolis. This relationship, in turn, established a predominant context for day-to-day interactions with the villagers and his kin, since it implied a set of rules and expectations associated with the priesthood, including his “private” life.³⁷

While in network analytical terms, the tie between Aroules and Meletios opens only one path between the village priest and the wider social world, its relevance for the co-construction of the identity of Basileios Aroules is probably even greater than the constant interaction in the neighbourhood context (although the latter provides the framework for the day-to-day performance of “priesthood”). Even more, in terms of theology, this relationship between priest and bishop was imagined as part of a chain of interactions (“apostolic succession”) leading back to Jesus Christ, the most important “point of reference” in medieval Christian communication systems in general.³⁸

34 Reinhard, *Lebensformen Europas*, 272–73; Hertner, “Netzwerkkonzept,” 74–75.

35 Fuhse, “Die kommunikative Konstruktion,” 302–04. See also Holzer, “Von der Beziehung zum System,” 104.

36 For such interaction among Byzantine villagers from a network analytical perspective cp. also Mitsiou, “Networks of Nicaea.”

37 Kraus, *Kleriker im späten Byzanz*.

38 Kraus, *Kleriker im späten Byzanz*, esp. 59–60, 65 and 319–35 (on Aroules and his family). See also Everton, *Networks and Religion*.

This suggests that an exclusively quantitative or structural view of network graphs of past social formations is helpful for perceiving the scale, extent, and intensity of the webs of communication and interaction. It is not sufficient, however, to understand the relevance of nodes and links for actual identity-making and the emergence of (cultural or socio-economic) frameworks for interaction.

Relationships, interactions, and “stories”

As this example equally indicates, communication through the “media of proliferation” (i.e., the writing of documents providing information about Basileios Aroules) can take place among absentees. Especially in pre-modern societies, however, a “symbiotic connection” between relationships, communication, and actual interaction, often in a “face-to-face” context, can be observed.³⁹ This is even true for “media of proliferation” if we think of the constitution of a medieval charter in the presence of interested parties and witnesses or the act of the public reading of a letter in front of the addressee and their retinue.⁴⁰ The “power of rituals” has been particularly highlighted in medieval studies in the last decades—in the studies of Gerd Althoff, for instance, who writes: “Power in the Middle Ages had to be illustrative. This happened through acts of representation in which not only glory and wealth were shown publicly. By using ritual and ceremonial acts, commitments and relationships were depicted, rights recognised and much more. [The e]xercise of power took place very much in such acts. Its character was nowhere more directly expressed than in the often interactive action of the powerful in public. In that public power and ritual met, because through the ritual the possibilities of power were established, and its limits were set.”⁴¹

These acts of historical communication are mostly accessible to us via artefacts of communication, such as texts of historiography, letters, and documents which describe or define a specific act of interaction or communication.⁴² In terms of relational sociology, such sources convey elements of stories of relationships as defined by White.⁴³ Letters in Antiquity and the Middle Ages did not possess the “intimate”

39 Cp. also Kieserling, “Kommunikation;” Holzer, “Differenzierung,” 51–52; Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive,” 315–16; Holzer, “Von der Beziehung zum System,” 106.

40 Mullett, *Theophylact of Ochrid*; Grünbart, “Tis love that has warm’d us.”

41 Althoff, *Die Macht der Rituale*, 11. Cp. also Schlögl, “Der frühneuzeitliche Hof,” and esp. Arlinghaus, “Mittelalterliche Rituale” (for a systems-theoretical perspective).

42 Hertner, “Netzwerkkonzept,” 69. For challenges of turning medieval narratives into network models, see also Kenna, MacCarron, and MacCarron, *Maths Meets Myths*, or Preiser-Kapeller, “Letters and Network Analysis.”

43 Fuhse, “Die kommunikative Konstruktion,” 292, 301, 307.

character of personal communication like today.⁴⁴ The rhetoric of classic epistolography, however, often provides a metaphorical yet no less impressive description of the “co-construction” of relationships and identities within networks (while, at the same time, documenting acts of communication among absentees). In a letter to Peter, archbishop of Alexandria, the fourth-century Cappadocian Church Father Basil the Great wrote, for instance:

“Eyes are promoters of bodily friendship, and the intimacy engendered through long association strengthens such friendship. But true love is formed by the gift of the spirit, which brings together objects separated by a wide space and causes loved ones to know each other, not through the features of the body, but through the peculiarities of the soul. This indeed is the favour [...] the Lord has wrought in our case also, making it possible for us to see you with the eyes of the soul, to embrace you with [...] true love and to grow [as] one with you, as it were, and to enter into a single union with you through communion according to faith.”⁴⁵

One of the most elaborate analyses of rhetorical constructions of identities and relationships in pre-modern epistolography is Paul McLean’s magisterial study, “The Art of the Network,” about Renaissance Florence. There, he demonstrates on the basis of thousands of letters how “selves and relations are discursively constructed by patronage seekers”. Such may we observe the transformation of “Rhetorics into Relations”—here modifying the title of Peter S. Bearman’s equally illuminating book.⁴⁶

Thus, there existed a large semantic pool for the interpretation and definition of network ties. However, not every term was appropriate or even permitted in every relationship in medieval societies. In April 1343, for instance, the Synod of bishops in Constantinople was concerned with a letter which one of their peers, Metropolitan Matthaïos of Ephesos, had sent to Emir Umur I of Aydın (in Western Asia Minor). The Synod was especially concerned with the way Matthaïos had addressed the Muslim potentate, because he had called Umur “his beloved son and himself the father” of the Emir. Furthermore, he referred to the clergy in Pyrgion, the capital of Aydın, “as the priests” of the Emir. The Synod declared:

“This he [Matthaïos] should not have done. For it befits high dignitaries of the Church to observe [the appropriate form of address] for such persons and not to use the same titles similarly for believers and for heathens

44 Mullett, *Theophylact of Ochrid*; Preiser-Kapeller, “Letters and Network Analysis.”

45 Basil, ep. 133, ed. Deferrari, Vol. II, 302. Translation from Mullett, *Theophylact of Ochrid*, 113.

46 McLean, *The Art of the Network*, esp. 1–34 and 224–29; cp. also Mische, “Relational Sociology,” 88, and Bearman, *Relations into Rhetorics*.

and infidels. By all means, there must be a differentiation in the form of address as well as in everything else.”⁴⁷

The use of metaphors which indicated spiritual kinship was common in the ecclesiastical correspondence of (Late) Byzantium, but was limited to addressees of orthodox belief. If even Catholic rulers were excluded from the circle of spiritual children of the Byzantine Church, the consternation of the Synod about Matthaios’ letter becomes comprehensible.⁴⁸ Thus, within communication systems of the past, specific terms and “stories” were confined to specific, communicatively determined contexts, and thereby specific relationships could be accepted or not.⁴⁹

Multiplexity and the “crossing of social circles”⁵⁰

Of interest is also the interplay between attributed and acquired relationships (see above) and between communications belonging to different communicative systems in the sense of Luhmann (such as political, economic or religious) within networks, or—in network analytical terms, the multiplexity of links.⁵¹ For a “modern functionally differentiated” society, Luhmann assumed a “release” of individuals from the framework of attributed relationships. This implies that a person within a specific communicative context would be addressed only according to his or her corresponding function, not on the basis of his or her identity within another context. For traditional hierarchical societies, in contrast, he supposed a “total inclusion” of individuals, meaning that the identity or specific position of a person in the context of a predominant “guidance system” (religion, for instance) would also define to a high degree her or his position in all other contexts.⁵²

So while today a medical doctor in the specific professional context may only be addressed as a physician, the identity of members of a religious or ethnic minority, for instance, would in pre-modern society very much define their addressability

47 *Das Register des Patriarchats von Konstantinopel II*, ed. Hunger, Kresten, Kislinger, and Cupane, no. 144, 322, 46–53 (April 1343); Kresten, “Pyrgion;” Preiser-Kapeller, “Conversion, Collaboration and Confrontation.”

48 Cp. Preiser-Kapeller, “Familie der Könige;” Preiser-Kapeller, “Our in the Holy Spirit beloved Brothers.”

49 Cp. also Becker, “Einleitung,” 16. On ecclesiastical networks in the medieval West, see for instance Lorke, *Kommunikation über Kirchenreform*.

50 On this term established by Georg Simmel (1858–1918) cp. Holzer and Schmidt, “Theorie der Netzwerke,” 232; Hertner, “Netzwerkkonzept,” 68.

51 Cp. also Laux, “Bruno Latour Meets Harrison C. White,” 382.

52 Bommes and Tacke, “Das Allgemeine und das Besondere;” Tacke, “Differenzierung,” 244–45, 257; Fuhse, “Die kommunikative Konstruktion,” 304.

in all contexts of social life. This is why we read about “Jewish” or “Christian physicians” at the Abbasid court of Baghdad, for instance. In this context, the limited addressability of such persons within medieval Islamic society, due to their religious background and thus their greater dependence on ties to the ruler, even increased their chance of selection for positions of trust.⁵³

In other cases, the correlation of networks with spatial (neighbourhood, regional origin) and/or social proximity (kinship) allows for their stabilisation through simplification. Franz-Josef Arlinghaus, for instance, wrote about an “amalgamation of family and company” by Italian merchants around 1400 CE, who thereby achieved an “increase of complexity without functional differentiation” (in the terms of Luhmann).⁵⁴ Relations of trust or reciprocity in business thereby received additional “external” footing and could also be connected to phenomena of “social homophily” in networks. “Homophily,” in turn, could contribute to the emergence of clusters with a higher density of relationships among “homogeneous” identities from a quantitative point of view.⁵⁵ But this external embedding had to be augmented by a basis for reciprocity produced within the network. Merchants from the same city doing business abroad may have granted one another a degree of trust through leaps of faith, but for the establishment of a durable commercial relationship, actual benefits had to be produced within the new network.⁵⁶

Trust could be established not only by direct interaction but also via relationships with a common third party. This could take place via the mobilisation of contacts of contacts in the form of recommendations, for instance, as Paul D. McLean analysed them for Renaissance Florence. It may also be the case that attenders have a relationship with an absentee, and on the basis of this “indirect” relation, develop communication with each other. The character of these already existing relationships can very much influence the terms of the new one.⁵⁷

53 Griffith, *The Church in the Shadow of the Mosque*; Gutas, *Greek Thought, Arabic Culture*. Cp. also Bommes and Tacke, “Das Allgemeine und das Besondere,” 33; Preiser-Kapeller and Mitsiou, “Mercantile and Religious Mobility.”

54 Bommes and Tacke, “Das Allgemeine und das Besondere,” 43; Arlinghaus, “Mittelalterliche Rituale,” 122–28.

55 Fuhse, “Zu einer relationalen Ungleichheitssoziologie,” 183, 190–93. On homophily, see McPherson, Smith-Lovin, and Cook, “Birds of a Feather.”

56 Bommes and Tacke, “Das Allgemeine und das Besondere,” 35–38, 43–44; Tacke, “Differenzierung,” 252–53, 257, 260; Hertner, “Netzwerkkonzept,” 73. For a historical example, see for instance Burkhardt, *Der hansische Bergenhandel*; Apellániz, “Venetian Trading Networks” or Preiser-Kapeller and Mitsiou, “Mercantile and Religious Mobility,” and esp. also Greif, *Institutions and the Path to the Modern Economy*.

57 McLean, *The Art of the Network*; Tacke, “Differenzierung,” 256; Holzer, “Differenzierung,” 54; Holzer, “Von der Beziehung zum System,” 104–05.

These phenomena have been described in the field of social network analysis using concepts such as “transitivity” or “triadic closure” (A is connected to B, and A is connected to C; therefore, eventually B and C will also get directly connected via direct or indirect intermediation, e.g., through a letter of recommendation of A).⁵⁸ Within the framework of “systems network theory,” the consideration of the systemic context and multiplexity of relationships and the potential influence of relationships established in one context (regional origin, for instance) for the “closure of triads” in other contexts (commercial partnership) adds depth to qualitative as well as quantitative analysis.⁵⁹ An example of such a historical network analysis is Padgett and Ansell’s classic study “Robust Action and the Rise of the Medici,” where the combination of different social contexts and functional aspects in a social network is highlighted as the basis for the rise of the Medici in fifteenth-century Florence.⁶⁰

Organisations and other “actors”⁶¹

Relational sociology, as well as systems theory, regard not only “persons” as possible points of reference for communication and relationships. Organisations and other larger social formations (such as the Mailberger Bund of 1451, see above), up to the level of polities,⁶² can also be connected in networks and, respectively, are constituted and constructed in relational contexts.

“Addresses emerge when communicative meaning is coherently attributed to a sender or receiver, to someone [...] whom communication can perceive as [an] entity of communication. This can be the case not only for individuals as persons, but also for organisations.”⁶³

Thereby, we can observe, also in the semantics of everyday life, a double attribution of communicative acts. They are often attributed at the same time to a person and to an entire organisation. The integration of such double attributions of communicative acts into “stories” and the “horizon of expectations” connected with relationships can also mark the actual emergence of such a larger social formation as a more permanent point of reference within social systems.⁶⁴

58 Degenne and Forsé, *Les réseaux sociaux*, 139–42; Prell, *Social Network Analysis*, 141–48.

59 Tacke, “Differenzierung,” 254–55; Holzer, “Differenzierung,” 60–62; Hertner, “Netzwerkkonzept,” 70; Martin and Lee, “Wie entstehen große soziale Strukturen,” 119–20.

60 Padgett and Ansell, “Robust Action.” Cp. also Hertner, “Netzwerkkonzept,” 73–74.

61 Cp. esp. Holzer, “Von der Beziehung zum System,” 106–10.

62 Cp. for instance Maoz, *Networks of Nations*.

63 Bommers and Tacke, “Das Allgemeine und das Besondere,” 32. Cp. also Fuhse, “Die kommunikative Konstruktion,” 298–99, 306–07; Laux, “Bruno Latour Meets Harrison C. White,” 379; Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive,” 316.

64 Holzer and Fuhse, “Netzwerke aus systemtheoretischer Perspektive,” 316–17.

Network analysis accounts for such phenomena to a certain degree using methods of two-mode or multi-mode networks (with two or more categories of nodes). “Classic” examples are two-mode networks of companies and board members for the reconstruction of corporate elites and inter-corporate networks. But in most cases, such two-mode networks are ultimately decomposed into one-mode networks of interconnected individuals and of entangled companies, for instance. The actual communicative interplay within and the semantic construction of multi-modal networks may be taken into consideration to a greater degree.⁶⁵

Within organisations, “social relations are selectively conditioned”: membership in a formal organisation defines a pool of potential relationship partners. It also includes the fulfilment of a specific set of formalised “expectations of behaviour” (as in the above-mentioned case of “priesthood,” for instance). Thus, within organisations, the “contingency” and “uncertainty” of communication can be reduced to an even higher degree than within the framework of attributed or acquired relationships. Thereby, potentials for a higher degree of social complexity for a specific purpose—the elaborate hierarchy of the medieval church, for instance—are created. At the same time, pre-modern sources make clear that this process of “formalisation” was less rigid and more constrained by the implications of other contexts of identity than in modern “functionally differentiated” society as defined by Luhmann.⁶⁶

Furthermore, relationships within networks are often established, especially in contrast to formal membership rolls. Luhmann analysed the emergence of such informal relationships and networks within organisations as early as the 1960s. Informal communicative stories between persons, for instance, emerge in situations which are not totally covered by formalisations, such as everyday interactions—although in most cases, the total ignorance of formalised positions of persons can be observed very rarely, and even more in pre-modern status-conscious societies.⁶⁷ Again, the multiplexity of relationships and their interplay in the construction of communicative realities is highly relevant.

Network growth and the emergence of large-scale social systems⁶⁸

As already indicated above, “emergence” and “complexity” are not found only in “large-scale networks,” but are inherent properties of social systems independent of

65 Cp. Carroll and Sapinski, “Corporate Elites;” Hertner, “Netzwerkkonzept,” 78.

66 Baraldi, Corsi, and Esposito, *GLU*, 129–31; Holzer, “Von der Beziehung zum System,” 107. For the limitations of organisational formalisations cp. esp. Schlögl, “Der frühneuzeitliche Hof,” 199–204, and Sikora, “Formen des Politischen.”

67 Cp. esp. Tacke, “Differenzierung;” Holzer, “Von der Beziehung zum System,” 107–08.

68 Cp. Becker and Reinhardt-Becker, *Systemtheorie*, 80–90, Becker, “Einleitung,” and Walz, “Theorien sozialer Evolution,” 46–70, for the historical dimension of Luhmann’s theory.

their size. Even the co-construction of a relationship within a dyad of two nodes can be described as an emergent and dynamic social system.⁶⁹

But Luhmann and researchers who have built on his theories were, of course, also interested in the emergence of large-scale social formations. Within the framework of systems theory, these are understood as the result of the transition from earlier, small-scale and segmentary societies, where relationships were mostly confined to face-to-face contexts, to hierarchically differentiated societies with an increasing number of persons. During this growth process, inevitably, some people became “hubs” who attracted more relationships than others, but also had to find a way to balance this with their limited capacity for direct interaction. Thus, “media of proliferation” (i.e., writing) as well as social identities of authority (“kingship”) and contexts of relationships (organisations) emerged, which did not necessitate constant face-to-face interaction and which could attract and formalise relationships and communication within larger social systems.⁷⁰

At the same time, differences emerged not only in the number, but also in the range and quality of relationships. While a large number of persons were still embedded in spatially limited networks of kinship and neighbourhood (such as the village priest Basileios Aroules), “identities” such as that of the “aristocracy,” for instance, led to the establishment of highly selective and transregional contacts for various political, familial or economic purposes (see the example of Ulrich von Eyczing above).⁷¹ Such disentanglements from local interaction networks also characterised other members of society, such as higher clergymen or merchants.⁷²

On the basis of the Paston Letters collection from fifteenth-century England, Alexander Bergs developed a scheme for the differentiation in the size, density, multiplexity and cohesion of social networks in a late medieval society with regard to variables such as gender, education, place of living (urban, rural) and status (Figure 3).⁷³

69 Fuhse, “Die kommunikative Konstruktion,” 306–07; Holzer, “Von der Beziehung zum System,” 98. Cp. also Stephan, “Emergenz in sozialen Systemen;” Mayntz, “Emergenz in Philosophie und Sozialtheorie.”

70 Holzer and Schmidt, “Theorie der Netzwerke,” 236; Holzer, “Differenzierung,” 53–58; Holzer, “Von der Beziehung zum System,” 106; Martin and Lee, “Wie entstehen große soziale Strukturen.” On such emergent phenomena cp. also Malkin, *A Small Greek World*, 31–33.

71 Luhmann, “Interaktion in Oberschichten.” Cp. also Gramsch, “Politische als soziale Grenzen;” Gramsch, *Das Reich als Netzwerk der Fürsten*; Habermann, *Verbündete Vasallen*.

72 Luhmann, “Interaktion in Oberschichten;” Holzer, “Differenzierung,” 54–56; Fuhse, “Zu einer relationalen Ungleichheitssoziologie,” 201. Cp. Granovetter, “The Strength of Weak Ties.”

73 Bergs, *Social Networks and Historical Sociolinguistics*, 59.

Variables	Checklist / Social network correlates							
	Number of ties		Density		Multiplexity		Overall network-structure	
	High	Low	High	Low	High	Low	Close-knit	Loose-knit
Gender	Male	Female	Female	Male	Male	Female	Female	Male
Education [§]	Higher	Lower	Lower	Higher	Higher	Lower	Lower	Higher
Literacy	High	Low/none	Low/none	High	Low/none	High	Low/none	High
Marital Status	Single	Married	Married	Single	Married	Single	Married	Single
Place of living [¶]	City	Village	Village	City	Village	City	Village	City
Reference group	Other	Family	Family	Other	Other	Family	Family	Other
Travel frequency	Frequent	Rare	Rare	Frequent	Rare	Frequent	Rare	Frequent
Travel destinations	(Inter-)national	Local/none	Local/none	(Inter-)national	Local/none	(Inter-)national	Local/none	(Inter-)national
Offices [†]	National	Local/none	Local/none	National	Local/none	National	Local/none	National
Contacts	High Prestige	Low Prestige	Low Prestige	High Prestige	Low Prestige	High Prestige	Low Prestige	High Prestige
Cluster [*]	No	Yes	Yes	No	Yes	No	Yes	No

Figure 3 Correlations between social attributes and network characteristics for pre-modern societies, scheme by Alexander Bergs (from Bergs, *Social Networks and Historical Sociolinguistics*, 59).

From a systems theory point of view, however, one should not only ask how attributes of identities correlate with quantitative and qualitative characteristics of social networks, but also how these characteristics contribute to the emergence of specific identities. The partial disentanglement of “aristocrats” from close-knit local networks freed up the capacity for far-reaching relationships of different qualities and greater numbers, which in turn accounted for the formation of “aristocratic” identity. While one special relationship decisively distinguished the priest within the otherwise relatively homogeneous interaction context of the village of Radolibos, aristocrats such as Ulrich von Eyczing distinguished themselves through the number and variety of their relationships (of authority, allegiance, friendship, commercial partnership, cultural exchange, etc.).⁷⁴ In this regard, the quantitative and structural properties addressed by formal network analysis also become relevant and historically meaningful again, highlighting the necessity of combining methods and theoretical approaches.

74 Cp. for instance Matschke and Tinnfeld, *Die Gesellschaft im späten Byzanz*. Cp. also Schlögl, “Der frühneuzeitliche Hof;” Gramsch, “Politische als soziale Grenzen?;” Gramsch, *Das Reich als Netzwerk der Fürsten*. See also Habermann, *Verbündete Vasallen*, and Habermann, *Spätmittelalterlicher Niederadel*, for an interesting attempt to combine multiplexity and quantitative measures.

Conclusion

What does a systems theory approach contribute to historical network analysis? The relational approach to past social realities inherent to historical network analysis from the perspective of systems theory is more appropriate than others. It becomes evident, however, that the emergence and reproduction of social networks involves many more prerequisites than “the flourishing semantics of network suggests.”⁷⁵ A purely quantitative-structural approach to nodes and ties allows only limited access to the complex interplay between communications, interactions, relationships and identities (and in network analytical studies, historical interpretation cannot do without recourse to the “qualitative” characteristics of nodes and ties anyway).⁷⁶ At the same time, identities and communications have a quantitative aspect (such as the differentiation among “aristocrats” through the number of ties, for instance)—and through processes of stabilisation and formalisation patterns of relationships emerge which can also be perceived from a structural point of view (such as “betweenness” as an emergent structural property as well as an attribute of a “broker-identity,” for instance).⁷⁷

Therefore, a detailed discussion of the construction and emergence of “relational” phenomena in historical network analysis is useful. This is, of course, easier with networks of a smaller scale, which allow in-depth studies of semantics to be developed and used within and for a network.⁷⁸ Ultimately, the multiplex and multi-modal “arrangement of interdependencies” does not permit simple explanations. Elaborate mathematical tools must be combined with conceptual complexity to detect “meaningful patterns” in past social systems.⁷⁹ Thereby, network analysis can be understood not as a tool of reductionist structuralism, but as a window into the complexity and diversity of human societies of the medieval past.⁸⁰

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75 Tacke, “Differenzierung,” 267.

76 Cp. also Fuhse, “Zu einer relationalen Ungleichheitssoziologie,” esp. 180–85.

77 Cp. also Fuhse, “Zu einer relationalen Ungleichheitssoziologie,” 180, 199.

78 Cp. also Fuhse, “Die kommunikative Konstruktion,” 313.

79 Laux, “Bruno Latour meets Harrison C. White,” 392; Mützel and Fuhse, “Einleitung,” 21; Hertner, “Netzwerkkonzept,” 81–82; Holzer, “Von der Beziehung zum System,” 98. Renate Mayntz observes an “irreducibility of emergent social phenomena,” cp. Mayntz, “Emergenz in Philosophie und Sozialtheorie,” 178–86.

80 Cp. also Kazhdan and Constable, *People and Power in Byzantium*; Gaddis, *The Landscape of History*.

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