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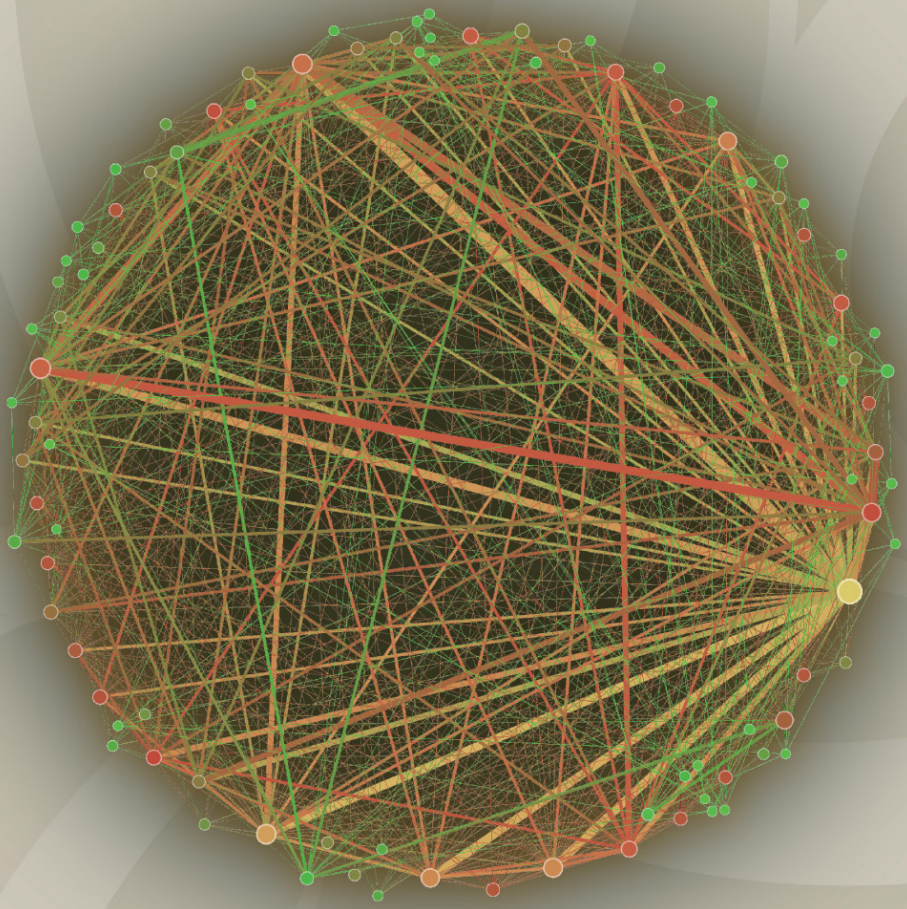
SOCIAL NETWORK ANALYSIS AND MEDIEVAL HISTORY

Edited by

MATTHEW HAMMOND



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UNCOVERING PATTERNS IN DISSIDENT INTERACTIONS AMONG LATE MEDIEVAL GERMAN WALDENSIANS USING SOCIAL NETWORK ANALYSIS

REIMA VÄLIMÄKI and DAVID ZBÍRAL*

THE VISUALIZATION AND analysis of historical social networks can provide valuable insights as exploratory techniques, highlighting connections between specific individuals and expressing their importance in a network or their network distance from one another. However, network analysis is not merely an exploratory or visualization technique. Rather, it shows its real power when the aim is to discover patterns in a larger set of rela-

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tional data, and to test specific hypotheses in ways that are hard to achieve with close reading or visual exploration alone. We will attempt to illustrate this analytical potential by looking at data collected from protocols of the inquisition led by the Celestine inquisitor Peter Zwicker in the city of Stettin (modern Szczecin) from November 1392 to March 1393, and from February to March 1394. We will look specifically at networks of social interactions and at the role that kinship, gender, place of residence, and religious ministry played in these interaction networks.

Zwicker's protocols are among the best sources concerning the lifestyle and beliefs of ordinary late medieval Waldensians, a dissident group that persisted despite centuries of persecution by the Church. The origin of the Waldensians was in the conversion of Valdes, a wealthy citizen of Lyon in 1170s. The strict imitation of apostolic lifestyle by Valdes and his early followers, and in particular their will to preach as laymen, was too much for the Catholic Church, and they were declared heretics in the 1180s. After this, the movement started to divert theologically from medieval Catholicism and the Waldensians became increasingly anti-clerical. The Waldensians thought that the Church's priests were sinful and corrupt, and they preferred to confess their sins and receive absolution and penance from their own dissident ministers—which, of course, was against the Church's doctrine of sacramental confession. The Waldensian's teachings were based on literal Biblicism, and among other things they condemned all oaths, death penalties and the Church's material possessions, and denied the existence of purgatory.[1] Zwicker's inquisition records are very suitable for the type of relational data analysis represented by social network analysis. Zwicker interrogated ca. 455 Waldensian supporters. Out of these depositions, 195 are still extant. All deponents were suspected of Waldensian heresy, and they came from the German-speaking villages, towns, and cities of Brandenburg and Pomerania on both banks of the river Oder, a region that nowadays lies at the border of Germany and Poland.

Since W. Wattenbach's seminal article in 1886,[2] and especially since D. Kurze's selective edition of the Stettin depositions,[3] these records have been extensively used in several studies,[4] and P. Biller dedicated a whole chapter

1 Two recent edited volumes sum up the existing scholarship on the medieval Waldensians, see Benedetti and Cameron, ed., *A Companion to the Waldenses in the Middle Ages*; Tasca, ed., *Storia dei valdesi 1*.

2 Wattenbach, "Über die Inquisition gegen die Waldenser."

3 Kurze, ed., *Quellen zur Ketzergeschichte Brandenburgs und Pommerns*, 77–261.

4 See esp. Werner, *Ideologische Aspekte*; Kurze, "Zur Ketzergeschichte"; Erbstösser, *Sozialreligiöse Strömungen*; Biller, *Aspects of the Waldenses*; Kieckhefer, *Repression*

to "Waldenses by the Baltic" in the recent *Companion to the Waldenses in the Middle Ages*.[5] The full potential of the Stettin depositions has not, however, been utilized. Zwicker was a meticulous inquisitor, recording each deponent's parents, other close family members, the names of those who hosted sermons of, and confessions to the Waldensian Brethren or introduced other suspects to Waldensianism, and other Waldensian acquaintances, as well as the deponents' birthplaces and residences. All in all, the depositions contain mentions of over one thousand persons in over one hundred locations, ranging from famous Waldensian Brethren through prominent supporters to deceased parents who had never had anything to do with heresy. The Stettin depositions thus provide unique data for studying the social dynamics and interactions in local Waldensian communities in late fourteenth-century Brandenburg and Pomerania. However, such an exploration requires an approach that allows for a systematic analysis of the actors and their relations.[6]

In this chapter, we use social network analysis to provide a comprehensive overview of the suspects, their social relations, kinship ties, and dissident interactions. We will focus on their social interactions rather than beliefs and customs, which have been extensively discussed in the studies cited above. Firstly, we give a general description of the Waldensians appearing in the Stettin records: their places of residence, occupation, and age. We then proceed to consider the insights gained from network analysis. We explore whether the Waldensians interrogated in Stettin formed one connected component, or more components isolated—at least as far as we know—from one another. We also compare the network positions of religious specialists (i.e., Brethren) vs. those of supporters (i.e., local Waldensians). Previous research has pointed out that despite the inquisitor's interest in the deponents' relationship with the Brethren and attempts to reveal their names, the Brethren appeared as relatively distant figures to the majority of deponents, many of whom were unable to name any of their confessors.[7] We explore whether social network analysis corroborates this view. Finally, we analyze the degree to which Brandenburg-Pomeranian Waldensianism was a local and familial phenomenon. In terms of network

of Heresy, 53–73; Utz Tremp, "Multum abhorrerem"; Cameron, *Waldenses*, 125–44; Biller, *The Waldenses*; Kurze, *Waldenser in der Mark Brandenburg und in Pommern*; Välimäki, *Heresy in Late Medieval Germany*; Välimäki, *More Powerful*.

5 Biller, "Waldenses by the Baltic."

6 Zbíral and Shaw, "Hearing Voices," 15–16.

7 Kurze, "Zur Ketzergeschichte," 78; Biller, "Waldenses by the Baltic," 173–74.

analysis, this means analyzing how far different kinds of social closeness (kinship ties, same gender, and same place of residence) underpinned dissident interactions.

Data, Data Collection Principles, and Data Survival

The Stettin inquisition protocols from the 1390s, once deposited in the Dominican convent of Prenzlau, were dispersed in the early modern period and have survived in two manuscripts, Herzog-August-Bibliothek Wolfenbüttel MS Guelf 403 Helmst. and MS Guelf 348 Novi. The former manuscript has been known to scholars since the 1880s, but the latter's heavily damaged contents were discovered only in the 1960s by Dietrich Kurze, who subsequently reconstructed the probable original order of the depositions based on medieval numbering, contents, and internal references. In his 1975 edition of the Stettin inquisition, Kurze estimated that the remaining folios contain 195 of the original ca. 455 depositions. Of these, thirty-two are damaged, a few of which contain hardly more than a few lines without any identifiable persons or details.[8] Thus, only 43 % of the original depositions have survived.

Kurze decided to give a summary edition of the majority of the depositions, and edit only a handful of interesting or representative depositions in full. This decision has been criticized,[9] and has resulted in limitations—though not always recognized by scholars—to the usefulness of the edition for the study of Waldensian beliefs. Specifically, Kurze left out many of the standard and formulaic answers to the inquisitor's questions. His edition does, however, dovetail extremely well with the social network analysis approach. Kurze, with his prosopographical emphasis, minutely recorded all personal names and locations, as well as all information relevant to the identification of individuals. Furthermore, his structured summary edition made the transformation into network data relatively straightforward and efficient, while his index of persons and locations has been a constant reference for the disambiguation of people and places. The data for this chapter are based on Kurze's edition, but in ambiguous cases, we consulted the reproductions of the original manuscripts.

8 See the introduction in Kurze, ed., *Quellen*, 18–31. The following description of the Stettin records is based on this.

9 Patschovsky, "Quellen zur Ketzergeschichte"; Biller, "Editions of Trials," 29.

The edition was manually transformed into network data following, by and large, the data collection principles of the DISSINET project.[10] Separate tables were created for persons and locations, with unique identifiers for each entry. The persons data table contains information (when applicable) on names, other identifiers, age, origin, residence, burial place, occupation, and known role in the trials (deponent or non-deponent). Most persons in the table are "definite" for analytical purposes, i.e., named persons who, with relative certainty, are not identical to any other person in the dataset. In addition, we included some indefinite persons to cover cases where it remains unclear to whom a deponent is referring. For example: Heyncze Wegener *alde* (old) and his adult son Heyncze Wegener *junge* (young) from the village Gross-Wubiser were both prominent members of the community. They hosted Waldensian meetings, and when other people refer to a Heyncze Wegener in Gross-Wubiser, it is sometimes impossible to decide which of them is in question. These cases are covered by an indefinite person "Heyncze Wegener *alde/junge*."

The location table contains the name of the location, its type (village, city etc.), relation to other locations (e.g., near to another location), and geographic coordinates. Geocoding was done manually, as it involved cross-referencing pre-war German locations with contemporary Polish rural villages. The starting point was the index of the edition, where Kurze had disambiguated the name variants in the depositions and provided their modern German equivalents. The locations which are nowadays part of Poland were identified using local historical resources, as well as German and Polish Wikipedia, which proved to be surprisingly helpful tools in the case of some small locations.[11] The coordinates, which relate to the settlement level, were taken from Google Maps and GeoHack. The default location label is the location's modern German name. We took this potentially controversial decision mainly because the modern German names correspond to the historical names much more closely than the modern Polish ones do, and Kurze's index, the main previous reference, uses these.

The relationships between individuals were then recorded in an extensive table of ties, which can be regarded as the formalization of the individual-to-individual relations and interactions mentioned in the depositions. We chose to classify the ties using a hierarchical three-level typology. For

10 Zbíral and Shaw, "Hearing Voices," 13–15; Zbíral et al., "Model the Source First!."

11 Most importantly, the resource to the old Landreis Königsberg (Nm.), see https://www.albert-heyde-stiftung.de/koenigsberg-neumark/sites/kreiskarte.htm.

example, the record that somebody was the father of another person in the dataset would be classified under "kinship" at the first, most general level, under "parent" at the second level, and under "father" at the third level. This approach allows for different levels of abstraction in the actual analysis, e.g., a focus only on father-son relations, on parent-child relations, or on interactions between all who had kinship relations of any kind. For the present article, the most important types were "heretical interaction," "introduction to heretical beliefs," "interaction with Brethren," and "kinship." Only relationships and interactions explicit in the source were recorded in the table of ties, though non-explicit kinship links were created through a set of logical implications, so that they are not missing from the analysis.

An important caveat in the interpretation of our results is that our analysis does not contain references to indefinite groups—for example, "heresiarchs," which is the inquisitor's designation for Waldensian ministers. Ties were collected only between specific persons identifiable in the depositions. In other words, only instances where the deponent said that they had confessed to a named Waldensian Brother are recorded, in contrast to general references that the deponent, for example, had confessed three times to heresiarchs. The data thus allow us to explore relationships between persons, but not to analyze the full depth of an individual deponent's involvement in Waldensianism. In the future, the dataset can be enriched in this direction, but the current analysis focuses on the intra-group interaction of named Waldensians—both Brethren and supporters.

As stated above, 195 of the original ca. 455 depositions have survived. Although the medieval numerator—possibly a member of Zwicker's staff—skipped over some numbers and used others twice, ending up with a final count of 443 depositions, we can trust that the overall number of deponents is broadly correct.[12] According to Kurze, it is possible that some documents were lost already in the early fifteenth century after Zwicker had entrusted the protocols to the Dominicans in Prenzlau.[13] There is no reason to assume the intentional destruction or non-preservation of particular depositions. Nevertheless, data loss can affect network data quite severely, especially in

12 One deposition corresponds to one deponent. A couple of deponents had more than one hearing, but already the medieval numerator collected them under the same deposition number.

13 Kurze, ed., *Quellen*, 26–28. In the deposition with the old number 428 (new 171), there is a reference to over four hundred already convicted and converted heretics:

see p. 235.

the case of important depositions being lost, and we acknowledge this limitation, which affects quantitative and qualitative research alike.

In our analysis, we have included anyone who had any interaction that we classified as dissident. In the edge list, we use further subdivision into three types ("heretical interaction," "introduction to heretical beliefs," and "interaction with Brethren"). This leaves us with a total of 529 persons connected by 995 dissident interactions. All in all, 1031 persons were recorded in the data. Excluded from our dissident network are persons who were denounced by the deponents but of whom no specific dissident interaction is recorded. While they were probably part of the Waldensian community, in this study we wanted to focus on those Waldensian supporters who are, in one way or another, known to have taken an active part in specific dissident interactions.

Waldensians in Brandenburg and Pomerania

The basic structure of the late medieval Waldensian communities in Northern Germany is well known. The local Waldensians lived double lives, engaging in dissidence while also remaining integrated in the surrounding society and participating in Catholic services such as masses for the dead and above all yearly confession and Eucharist at their local parish church. These local Waldensians can be called supporters, although the emic term was simply "the known" (ger. *die Künden*; lat. *noti*). They were visited by religious specialists, usually called Brethren in research, and heresiarchs by the inquisitor Zwicker. These visits were rather infrequent: yearly, once every two years, or even more rarely. Their main purpose was to hear the supporters' confessions and administer penances to them. Late medieval Waldensians maintained that all sins must be atoned for in this life, and therefore confession and penance were of pivotal importance for their faith. Preaching by laymen—the cornerstone of early Waldensianism—was still important but took place much more seldom than confessions.[14]

Although the inquisitor inquired after the names of the Brethren to whom the deponents had confessed or whose sermons they had heard, surprisingly few were able to name a particular Brother: there are overall twenty-four specific Brethren out of 529 dissidents (less than 5 %), and only ninety-two recorded interactions with one of them, in which no more

14 Kurze, "Zur Ketzergeschichte," 77–87; Cameron, *Waldenses*, 125–39; Biller, "Waldenses by the Baltic," 170–75.

than forty supporters––out of 195 deponents who were specifically interrogated about their connections to Brethren––are reported to have been involved. Since confessing to the Brethren and listening to their preaching has often been seen almost as a defining feature of Waldensianism, this is really a tiny proportion. It might be argued that not naming Brethren was a way to protect them rather than the outcome of a real lack of knowledge of their names, but this is virtually excluded in this inquisition: one has to remember that in Stettin, the Brethren had already converted and were referred to as having done so in the depositions. Rather, it seems that the Brethren were indeed distant figures to many supporters. Those deponents who named several Brethren were usually themselves central actors in the local community: Herman Gossaw from Gross-Wubiser, who hosted Brethren, instructed his fellow Waldensians about the inquisition and helped them with money, named a total of ten Brethren, as did Peter Beyer in Bärwalde, who was frequently named by other deponents as the host of their confession.[15]

Only one Waldensian minister is among the top fifteen dissidents in terms of the number of recorded heretical interactions (see Table 10.1 below)—namely, Nicolaus *conversus*.[16] With this name we refer to the Brother usually designated in the depositions as "now converted" (*iam conversus*). He was the last Brother to visit the Waldensian communities in the area; he was certainly receiving confessions in the autumn of 1391, possibly even in the spring or as late as the autumn of 1392, that is, only a few months before the inquisitions in Stettin commenced. This converted Nicolaus has been identified as Nicolaus Gotschalk, also known as Claus of Brandenburg, whose sister Geze was among the supporters interrogated in Stettin.[17] We, however, find that the identification of Nicolaus *conversus* as Nicolaus Gotschalk is not credible, especially as two deponents, one of whom was Nicolaus's sister Geze, seem to speak of "Nicolaus *iam conversus*" and "Nicolaus Gotschalk" as two different persons.[18] In our data, therefore, Nicolaus Gotschalk and Nicolaus *conversus* are treated as separate persons. Not one Waldensian Brother

15 Kurze, ed., *Quellen*, 89, 172.

16 The fifteenth on the list, "Nicolaus (heresiarcha)," while also a minister, must be discounted. The person node in question is indefinite and covers the cases when the deponent could have referred to any of the at least four ministers with the name Nicolaus/Claus.

17 Kurze, "Zur Ketzergeschichte," 79–81; Kurze, ed., *Quellen*, 351; Cameron, *Waldenses*, 140.

18 Kurze, ed., *Quellen*, 109, 259.

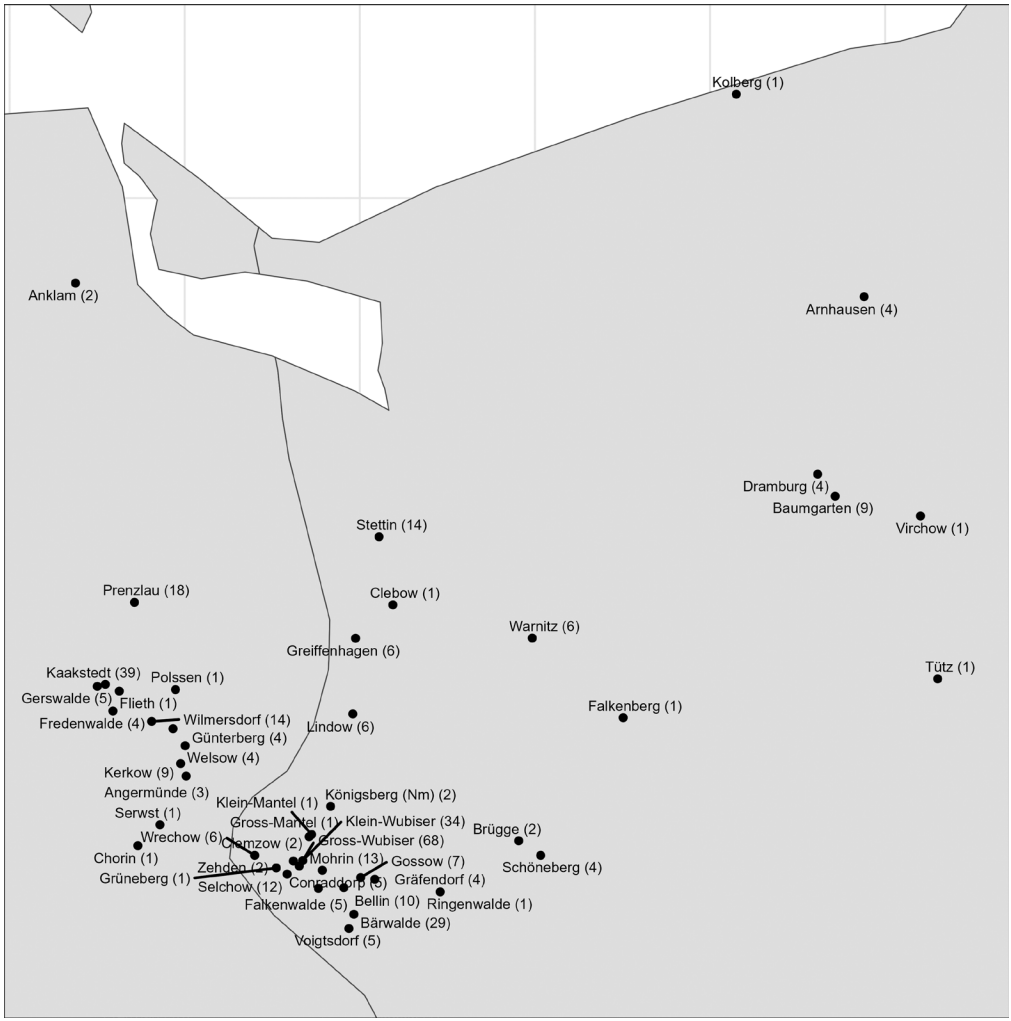

Figure 10.1. Residences of dissidents in the Stettin investigation. The numbers in parentheses mark the number of resident dissidents. Created by David Zbíral, 2023.

is among the deponents in Stettin, and therefore the following description of occupation, residence and age applies to supporters only.

By occupation, the Northern German Waldensians were farmers, servants, and craftsmen, living in rural villages but also in towns and cities. Kurze's characterization of them still holds. They represented, he writes, "the whole social middle and lower class: specialized and simple craftsmen, farmers with their own house and property, as well as non-independent workers and servants, both urban and rural." By contrast, wealthy mer-

chants and land-owning nobles were absent.[19] One should note that Zwicker and his notaries were not particularly interested in recording occupation. It appears that the occupation was noted when it somehow specified the person in question or was used by their fellows as a nickname or identifier. For example, Hans Rudaw was known as *cruger in/de Selchaw* (the potter in/of Selchow) and his wife Gyrdrud Rudaw was known by the nickname Crugeryn ("Potter's wife").[20] However, systematic information about the occupation is missing, and it is recorded only for ca. 11% of the 529 dissidents. We have been conservative in interpreting the family names deriving from occupation (e.g., Smed, "Smith") as a sure sign that the holders of these names actually practised the craft in question. Some likely did but by no means all.

We know the place of residence of as many as 377 out of 529 dissidents in our sample, i.e., 71% (see Figure 10.1). This is the minimum figure: in data collection we recorded only residences explicitly mentioned and inferable with very high certainty: e.g., living married couples were recorded as residents of the same settlement. As seen on the map, the villages of Gross- and Klein Wubiser and Kaakstedt had the highest number of resident dissidents, and can be regarded as hotspots of local Waldensianism.[21] There, Waldensians must have formed a significant proportion of the population, if not the majority. An average high medieval German village had a population of circa 100–120,[22] and after the famines and epidemics of the fourteenth century, the population of many settlements dwindled.[23] With several dozen recorded dissident inhabitants—even if this figure includes some deceased persons—we can say with confidence that everyone in these villages was either Waldensian or aware, and silently approving, of the religious double life of their neighbours.

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19 Kurze, "Zur Ketzergeschichte," 88–89; Biller, "Waldenses by the Baltic," 166.

20 Kurze, ed., *Quellen*, 146, 202–3.

21 However, a caveat is in order: given that more than 50 percent of the original records were lost, it is possible that some settlements are seriously underrepresented in our data. This could have happened if several of their residents had been cited to appear simultaneously before the inquisitor and those records were among the lost folios. Nevertheless, inhabitants of the most important dissident villages appear in the records throughout the course of the inquisition, and it is likely that these settlements would retain their position even if we had the complete set of records.

22 Rösener, *Peasants*, 62.

23 Peter Biller has pointed out that references to some settlements as abandoned in the Stettin records indicates that the population decline had also affected Brandenburg and Pomerania: see Biller, "Waldenses by the Baltic," 166.

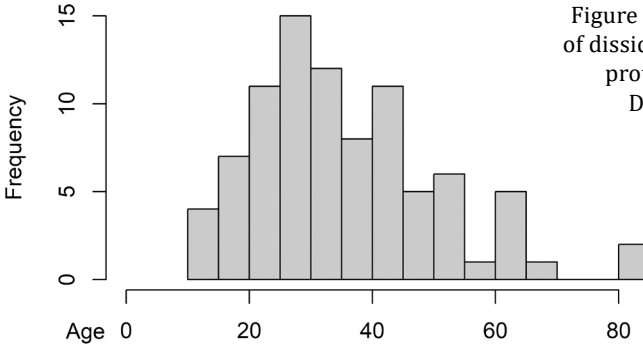

Figure 10.2. Known ages of dissidents in Zwicker's protocols. Created by David Zbíral, 2023.

Despite the prominence of these rural settlements, the data somewhat challenge the tendency in scholarship to describe the Northern German Waldensians as "rural" by comparison to the "urban" Waldensians of the Rhineland and Swiss cities.[24] It is true that, unlike in Strasbourg or Fribourg, there were no wealthy merchants or city council members among the Waldensians interrogated in Stettin, but not all of them lived in small villages. Bärwalde (Mieszkowice), Prenzlau, and Stettin all had sizable Waldensian communities. Of these, the Hanseatic city of Stettin, which, at the end of the fourteenth century, counted a population of eight thousand to nine thousand persons, was an urban centre comparable to the Rhineland cities.[25] The populations of Bärwalde and Prenzlau are more difficult to estimate. Albeit smaller, they were thriving towns: in 1353, Bärwalde became the mint of Neumark, and in the fourteenth century, walls were built around the town. Prenzlau was experiencing its heyday and ranked among the most important towns in the Mark Brandenburg.[26] In these cities and towns, dissident life must have been different from that in the smaller settlements; the Waldensians were a small minority there, living amidst a Catholic majority.

The age of Waldensian supporters in the Stettin protocols ranged from early teens to about ninety years at the time of trial, with a mean of thirty-five. The age is known for circa 17 percent of the sample, all of whom were deponents. The notaries seem to have had a tendency to record the age of unusually young or old deponents. In comparison, age information is missing for many deponents apparently in their prime. Consequently, we esti-

24 Erbstösser, *Sozialreligiöse Strömungen*, 121–30; Biller, *Waldenses*, 113; Deane, "Archiepiscopal Inquisitions," 205–6; Smelyansky, *Heresy and Citizenship*, 1, 5, 8, 42.

25 Benl, "Pommern," 85.

26 Escher, "Viele Hauptstädte."

mate that in the available age data, the group of twenty-to-fifty years is underrepresented in comparison with young and old persons (Figure 10.2).

Insights from Social Network Analysis

Social network analysis provides a structural, quantitative perspective on relational data which involve connected elements, called nodes or vertices (e.g., persons), and their connections, called ties or edges (e.g., social relations). This methodology is very well-suited to the study of inquisition records, many of which are exceptionally rich in data on relations and interactions between specific people.[27] One of the main strengths of social network analysis is its ability to cross-check, and thus either corroborate with more confidence or, as is often the case, challenge conclusions based on close reading. It does so through a systematic look at the network of social relations and interactions. While applications of social network analysis in historical research have often remained focused on visualization for prosopographical purposes, it has, with all due source-critical caveats, a strong analytical potential to help answer specific research questions about past networks. In this chapter, we will benefit from its descriptive-statistical insights into dissidence covered by Zwicker's protocols.

The network of dissident interactions we analyze here is a formal model of relations recorded in the Stettin protocols. Some of the interactions reach quite far back in time: we are not dealing with a completely synchronic network through which information could flow or coordination might occur at any specific moment in time, but with an imprint of a past social structure which has evolved over time, was partly uncovered by Zwicker's inquisition. The network data we analyze is derived from the final textual product of this process.

As previously noted, the extant depositions show a total of 529 persons engaging in dissident interactions, which is our sample in this analysis. Not all of them are connected into one large interaction network; instead, we find a large, connected component of 505 persons—whose most central figure, but by far not the only important one, is Peter Gossaw—alongside seven further, much smaller components of two to five people each. Circa 44% of people in our sample were women. Circa 32% of people in our sample were deceased by the time of trial, a figure which is explained by the deponents having to testify of their parents' involvement in heresy. The number

27 Pouivet and Schulz, "Montaillou"; Nieto-Isabel, "Communities of Dissent."

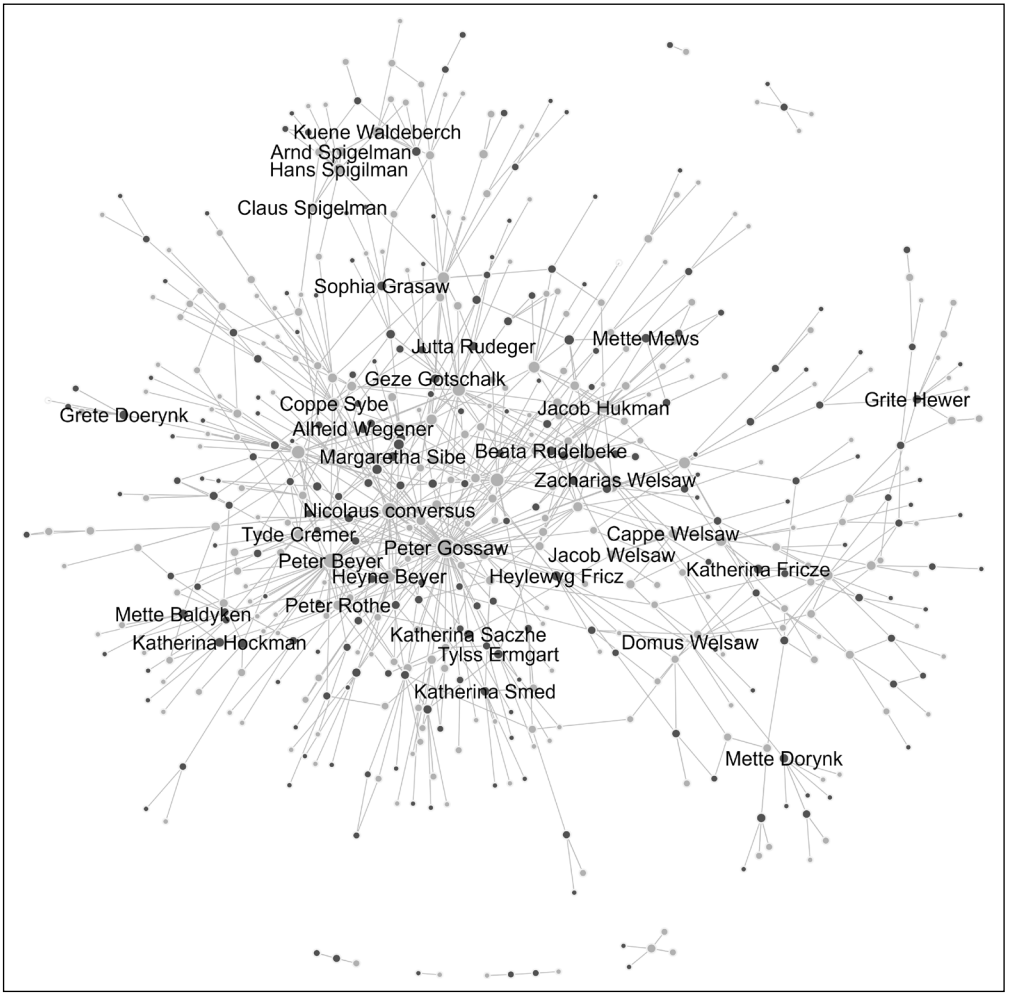

Figure 10.3. A visualization of the network of dissident interactions.
Men are in lighter shades, women in darker shades. Chart generated by David Zbíral.

of recorded dissident interactions is 995. These 995 dissident interactions involve 764 specific pairs of people, of whom as many as 747 are in the largest connected component of the network (see Figure 10.3).[28]

An important part of the network analysis toolkit is centrality measures, which express the structural importance of nodes (in our case, people) in a network (in our case, the network of dissident interactions). There are

28 For the network analysis, we used the igraph package for Csardi and Nepusz, "The Igraph Software Package for Complex Network Research."

many different centrality measures, each of which offers a different perspective on importance, thus allowing us to cross-check our intuitions regarding the importance of individuals and groups from different angles, among which are degree (number of ties), betweenness (a measure of importance for brokerage, i.e., bridging between parts of the network), and closeness (which looks at the length of path to other nodes, and thus the potential reach of a node within a network). Centrality measures can serve various purposes: to characterize the structure (topology) of the whole network; to identify important specific nodes, including those whose importance may not be obvious at first sight; to point to interesting nodes (e.g., those crucial in terms of brokerage while marginal in terms of degree); and, most importantly, to systematically study the whole distribution of centrality values in relation to other variables. Typically, centrality measures can tell us—in a much more reliable and systematic way than unassisted close reading—whether in a given network, from the perspective of a given centrality measure, one group of nodes—for instance, men—is more structurally important than another—for instance, women.

The top dissidents in terms of degree, i.e., the number of specific dissident interactions, were house-owning men who hosted confessions and sermons and otherwise advised and helped the members of the community: Peter and Herman Gossaw, Peter Beyer, Heyncze Wegener *alde*, and Hennyk Vischer. Many deponents remembered that their last confessions only a year or two before took place in the house of one of them. The high ranking of Hennyk Vischer of Klein-Wubiser is especially remarkable because, unlike other top supporters, there is no extant deposition of him, meaning that even mentions by others sufficed to put him in a quite central position in the network. The exceptions to this rule are the Waldensian Brother Nicolaus *conversus* and Sybert Curaw, the leader of the opposition to Zwicker's inquisition in Klein-Wubiser. When Zwicker uncovered who was behind this opposition, Sybert was mentioned by several other deponents.[29]

The average degree across the whole network is ca. 3.8, meaning that a person in our sample has on average ca. 3.8 dissident interactions recorded. We used the degree values of all persons involved in dissident interactions for two main comparisons: we compared the scores of men with those of women, and the scores of ministers (Waldensian Brethren) with those of their supporters. Concerning gender, our analysis provides a great example of just how the impression from close reading, and even the list of top

29 A summary of these events is in Cameron, *Waldenses*, 141.

Table 10.1. Top fifteen dissidents in terms of degree (number of connections).

Name	Sex	Degree	Betweenness [0,1]
Peter Gossaw	M	64	1.000
Peter Beyer	M	36	0.407
Herman Gossaw	M	29	0.421
Nicolaus *conversus*	M	28	0.640
Heyncze Wegener *alde*	M	27	0.168
Hennyk Vischer	M	23	0.139
Heyne Beyer	M	23	0.188
Coppe Sybe	M	18	0.136
Hennyng Gerencz	M	17	0.297
Sybert Curaw	M	15	0.158
Hannes Rudeger	M	15	0.230
Hans Spigilman	M	15	0.082
Hans Cremer	M	14	0.081
Hennyk Zacharias	M	14	0.270
Nicolaus (*heresiarcha*)	M	14	0.194

nodes, can be misleading. While men seem to be much more prominent than women to the eye of an attentive reader, a conclusion that seems to be supported even by the list of the most connected people (Table 10.1), the difference disappears once we compare the whole distribution of degree values. In doing so, we find absolutely no noteworthy difference in the importance of men and women (Figure 10.4) in fact, if anything, it is women rather than men who reach a higher median (shown by the horizontal line within each box of the box plot). Such conclusions demonstrate the potential of network analysis to transcend anecdotal evidence and first impressions through a systematic look at the complete data at our disposal.

The results for the betweenness and closeness centralities were very similar. We can thus be reassured that against impressions gained from reading, women, though less visible at first sight, were no less involved than men in the network of dissident interactions covered by the Stettin protocols, not only in terms of numbers of connections, but also in terms of brokerage—meaning, in this context, being involved in dissident interactions with different parts of the network otherwise not well connected. On the other hand, as the scores from the three centrality measures we examined really show women and men as roughly equal, they also challenge inquisitor

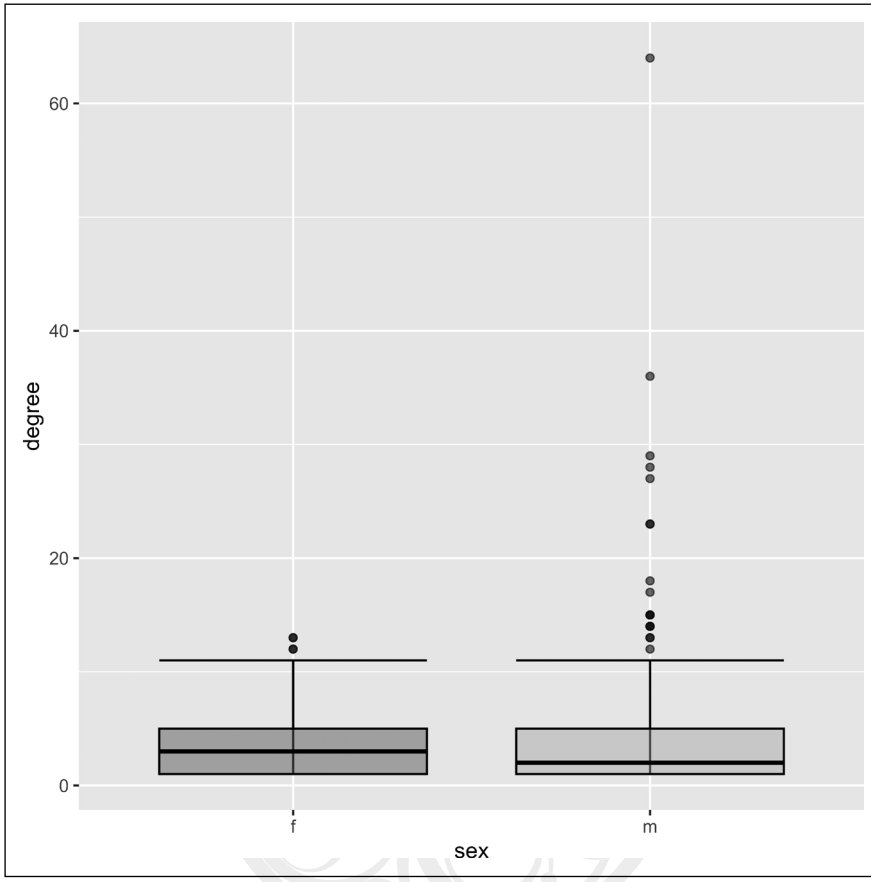

Figure 10.4. A box plot comparing the degree values of men and women. Created by David Zbíral, 2023.

Zwicker's polemical view, taken over from a long tradition of anti-heretical polemics, that it was especially women (pejoratively labelled "little women," *muliercule*, by Zwicker) who assisted heresiarchs and introduced new supporters to heresy.[30] When we look at the introduction patterns, we obtain similar results as with centrality measures. In the inquisitorial terminology, an *inductor/inductrix* was a person who introduced a supporter to a minister for their first confession. In the data we have 91 male-male, 97 female-female, 76 male-female and likewise 76 female-male introductions. These figures are again surprisingly gender-equal.

30 Petrus Zwicker, *Cum dormirent homines*, col. 280D; see also Biller, *Waldenses*, 288.

While a few house-owning men with close connections to Waldensian ministers do stand out, there is overall no difference between men and women in network centralities, thus warning us, in this instance, both against being guided by first impressions or toplists (which are here challenged by looking at the whole distribution of centrality values) and against taking polemical interpretation at face value. Here, a formal analysis of the data also offers an interesting takeaway for the debate on the construction of heresy in inquisition records and their biases. While Zwicker endorses the *topos* of women's prominence in heresy in his theoretical work, he does not seem to force this interpretation into his practical investigation. On this point, his heresy trial records do not follow his general outlook on Waldensianism, which signals quite some degree of openness to empirical knowledge, as P. Biller has repeatedly pointed out.[31] This example shows how the quantitative analysis of relational data can be informative even for paradigmatic theoretical debates in medieval studies by providing specific, precisely expressed, and reproducible evidence.

Besides comparing the centralities of men and women, we also compared the centralities of ministers and supporters. In terms of degree, we again found not only that named dissident ministers do not have more connections overall, but that it is, in fact, supporters who predominate. An even more interesting metric, in this case, is betweenness, which is a measure of brokerage, because we might reasonably assume that dissident ministers would be the mobile agents connecting local, settlement-based, often familial Waldensian units, a phenomenon that D. I. Nieto-Isabel has observed in Languedocian Beguin communities, and that, thus, they would interact with many otherwise unconnected supporters.[32] This is, however, by no means the case here: supporters easily outscore ministers even in betweenness (Figure 10.5).

Unlike in the comparison of men and women, this result may arguably be driven by the underrepresentation of dissident ministers among deponents (there is not even a single one), and by our focus on specific, identifiable dissident ministers rather than unspecified individuals and groups in this analysis. With this source-critical and data-collection caveat, we can nevertheless safely say that our formal analysis reinforces previous conclusions: most Waldensian supporters in Brandenburg and Pomerania did not

31 Biller, *Waldenses*, 287–89; Biller, "Goodbye to Waldensianism?," 19–21; Biller, "Inquisitors' Interrogations," 378–79.

32 Nieto-Isabel, "Communities of Dissent," 261–66.

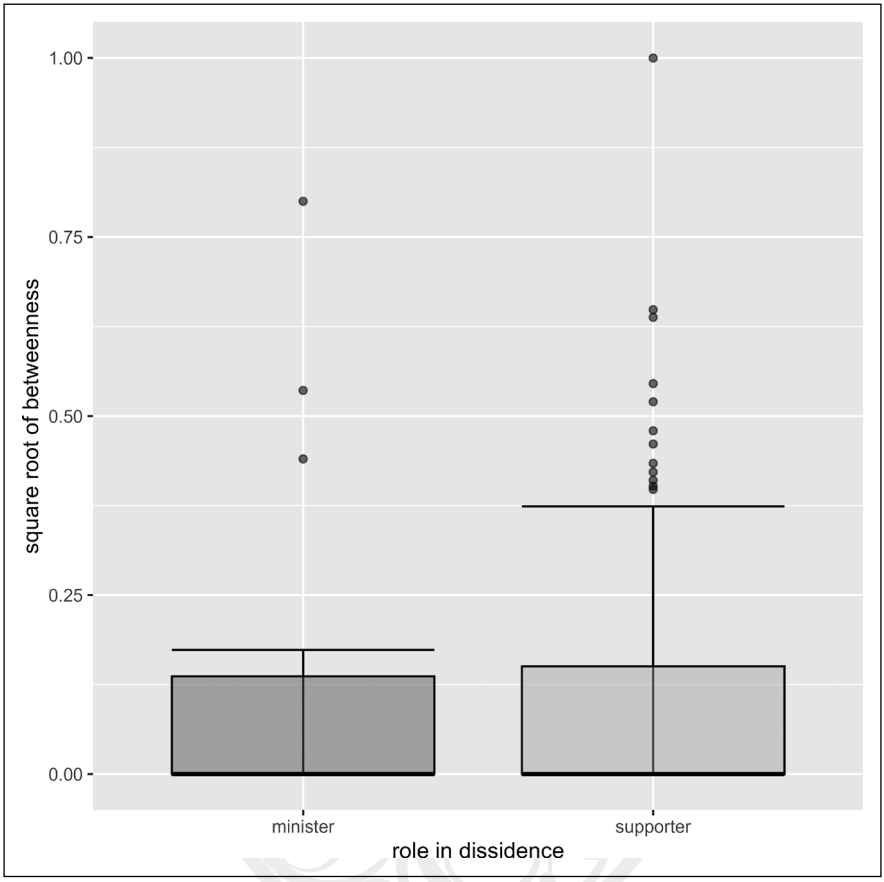

Figure 10.5. Box plot comparing the betweenness of ministers and supporters. Since betweenness distribution tends to be skewed towards lower values, we are using a square root value for better readability. Created by David Zbíral, 2023.

have close personal connections to the Brethren. The Brethren fulfilled the supporters' crucial spiritual needs as confessors, and they were respected, sometimes even feared figures, but they did not serve as the social glue of the community. They were not the most important brokers in the network of dissident interactions, which was well-connected even without them.

Apart from centrality measures, another benefit of network analysis is its ability to formally express the tendency to connect (in our case, engage in dissident interactions) with nodes sharing some characteristics. The common-sense observation that human social networks often display this tendency—though this, of course, depends on the semantics of the ties and the characteristics we are looking at—is formally expressed through measures of homophily. In this study, we used homophily to assess whether dissidents

uncovered by the Stettin trials interacted with similar peers more than with dissimilar ones. We considered three different characteristics: occupation, gender, and place of residence. In this part of the analysis, we needed to drop those ties where any of the nodes connected by those ties into pairs had the given characteristic missing. It turned out that the analysis of occupation is virtually meaningless in this dataset, because while occupation is known for about 11 percent of the sample, when we look at dyads where both ends of the interaction have the attribute covered, the network shrinks to but a tiny part of the dissident ties known. More promising proved to be the examination of homophily by residence and gender (in the sense of identity socially ascribed to a person by giving them a male or female name). Concerning gender, the network filtered down to ties where gender is known at both ends represents almost the whole network (98.79%). On the basis of some general ideas concerning the widespread gender homophily found in voluntary associations,[33] among which we can easily count medieval dissident movements, and the somewhat gendered character of social interactions in high medieval Europe,[34] we expected that we would find at least a slight tendency towards homophily alongside gender, but, in fact, found none. The homophily index, which falls between -1, signalling complete heterophily (i.e., interacting only with peers with a different value of the attribute), and 1, signalling complete homophily, was -0.07.[35] This means that, in our sample, we positively observe no preference for either persons of the same, or of the other gender. This result points in the same direction as D. Nieto Isabel's conclusions on the absence of gender homophily in Beguin and Cathar networks of Languedoc.[36]

The complete opposite is true for residence, where data were available for as much as 74% of the entire dissident network. Here, we found strong homophily (0.42).[37] This means that sharing a place of residence underpinned dissident interactions to quite an unexpected degree in the Stettin

33 McPherson, Smith-Lovin and Cook, "Birds of a Feather," 422–24.

34 See, e.g., Jones, "Public and Private Space."

35 We used the *assortativity nominal* function from the igraph package. See Newman, "Mixing Patterns"; Newman, "Assortative Mixing." Homophily indices give a more precise idea than a simple proportion of same-same vs. same-different ties, since they also take into account the number of theoretically available peers with the same vs. a different value of the attribute.

36 Nieto-Isabel, "Communities of Dissent," 290–91, 368–69.

37 Due to missing data, the assortativity values were counted from differently filtered networks. Therefore, they should not be compared straightforwardly with

protocols. Looking at the spatial aspect of dissident interactions from a different angle, 254 ties (or 33.25% of all dissident interaction dyads) connect people who are known to reside in the same settlement. Unlike the homophily index, for which we took into account only people with recorded residence, this proportion was counted from all unique undirected dissident ties, i.e., including those where the residence of one or both participants is not known, and there is certainly a high likelihood that some of them were still from the same settlement. This means that the 33.25% proportion of local ties, connecting people residing in the same settlement, is the sheer minimum. This underlines the importance of completely local dissident interactions in the Stettin protocols.

Finally, a strong factor underpinning dissidence in Stettin seems to be kinship. Based on the text of the Stettin protocols, the dataset records 1,041 explicit kinship ties overall, which amount to 902 unique undirected kinship ties relating 827 people. The number of people is higher than the number of participants in dissident interactions (529), since the number captures the complete network of explicit kinship ties. Of course, this network of explicit kinship ties is fragmentary, as not all kinship ties would have been put down in writing. Therefore, we extended kinship ties through a set of logical inferences. For instance, we had to consider that if A is a brother of B, and B is a brother of C, then C is at least a half-brother of A. The ties that we inferred for the purposes of this study were the following. We used parent-child relations, sibling relations, and marriages to infer unrecorded siblings (incl. half-siblings), spouses of one's parent (i.e., own parents or stepparents), children of one's spouse (i.e., own children or stepchildren), grandparents and grandchildren, uncles and aunts, spouses of uncles or aunts (i.e., aunts or uncles, or step-aunts or step-uncles), nephews and nieces and their spouses, siblings-in-law, parents-in-law, and children-in-law.[38] We did not extend the inference further than that because we aimed at reconstituting just the closest kinship ties which can be safely reconstituted from the records, and for which we can be reasonably certain that the absence of such a close kinship relation in the resulting dataset is a true negative (real absence) rather than

one another. Nevertheless, they certainly provide an outlook on homophily "as far as we know," i.e., disregarding nodes where the attribute is missing.

38 Our scope inferred vertically three generations (i.e., grandparent, parent, child, but not great grandparent) and was horizontally flat (i.e., we inferred for instance uncle/aunt and in-law relationships, but not cousins; we stayed on the level of one generation in cross-core family relationships). We computed kinship just one step away from the collected data, i.e., we did not infer ties on inferred ties.

a false negative due to low data coverage. False negatives would certainly abound if we extended our kinship inference to very distant degrees. We then used these inferred kinship ties to enrich the explicitly recorded kinship ties, thus extending the network considerably: those same 827 people are connected with as many as 1,980 close kinship ties instead of 902. By comparing this kinship network with the network of dissident interactions, we found that out of 764 unique undirected dissident interaction ties, kinship underpins 252, i.e., almost exactly one third (32.98 %).

Conclusion

Social network analysis of the interactions recorded in Zwicker's Stettin protocols offers valuable insights into the functioning of dissidence, ones that are hard to precisely express and analyze through close reading alone. We suspected that Waldensianism investigated by the Celestine inquisitor in Stettin was a predominantly familial and local tradition, but thanks to the analysis of the structure of the interaction network revealed by the surviving documents, we now know much more precisely to what extent this was the case. In this instance, as many as one third of all interacting pairs of suspects known to us were also connected by close kinship ties, and again one third demonstrably resided in the same settlement—a number which would almost certainly rise if we knew the place of residence of all people who engaged in dissident interactions. Kinship ties and same residence ties abound and are certainly noteworthy, and, in this sense, quantitative analysis confirmed our expectations. It was indeed kinship and residence ties, not the visits of dissident ministers, which provided the social glue holding the Northern German Waldensian community together. Most importantly, however, network analysis allowed us to transcend binary characterizations (familial vs. extrafamilial; local vs. regional; sedentary vs. mobile), and, instead, to characterize dissidence in terms of ratios and distributions based on a systematic look at the data in their entirety.

In other instances, social network analysis even corrected our first impressions of Waldensians investigated by Zwicker. From close reading, it appeared that men were predominant in the dissident network. While we indeed found that the top people according to the number of connections were all men, looking at the number of connections across the whole sample, we concluded that, on the whole, women in no way lagged behind men. Looking at this result from a different angle, we also found no evidence of particularly active women overshadowing men, a situation that would have corresponded to Zwicker's polemical description of women as the

main helpers of the heresiarchs. Thus, in this respect (just as in some others pointed to in previous historiography), his practical investigation proved to be more immune to stereotypes he himself is known to have held than would commonly be believed about medieval inquisitors.

A comprehensive and systematic look at the sources at our disposal is easily the most important benefit of quantitative history in general and social network analysis in particular. Whether it corroborates or challenges an existing consensus, it has the ability to express in clear terms the proportion of the data which such consensus describes well, but also the proportion which the dominant view fails to comprehend. Social network analysis is far more than a new, more visual variant of prosopography. To a large degree, its potential transcends mere visual exploration and the identification of specific central actors. Its main strength lies in systematically comparing whole distributions of formal measures across groups (e.g., looking at the number of connections of all men in a network on the one hand and all women on the other) and in using precise analytical techniques to corroborate or challenge specific views on historical matters (e.g., looking at homophily measures to assess the relative importance of local vs. translocal ties in late medieval Waldensian communities). It is here that social network analysis finds the use it was meant for from its very beginnings in 1930s: rather than a mere visualization technique, it provides a valuable explanatory extension to the historian's toolkit, and joins the call for a new, data-oriented historiography, enabling historians not only to provide precise and analytically transparent answers to old controversial questions, but also ask new ones, including such which are, for methodological reasons, beyond the reach of the close-reading methods of qualitative historiography.

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