

*Interdisciplinary Journal of
Research on Religion*

Volume 14

2018

Article 1

**The Structure of Jesus's Social Network:
Subgroups, Blockmodeling, and Balance**

Jennifer M. McClure*

Samford University
Birmingham, Alabama

* jmcclore@samford.edu

The Structure of Jesus's Social Network: Subgroups, Blockmodeling, and Balance

Jennifer M. McClure

Samford University
Birmingham, Alabama

Abstract

Building on a recent article that introduced Jesus's social network, this study uses social network analysis to examine the structure of Jesus's social network in more depth. The analyses investigate the interpersonal connections recorded in the four Gospels of the New Testament, and they focus on three main categories of actors with whom Jesus had ties: his family and followers, the civil and religious authorities, and stigmatized people. This study utilizes three analytical techniques to describe the structure of Jesus's social network: (1) subgroup analysis to identify smaller cohesive communities, (2) blockmodeling analysis to examine different roles and positions, and (3) balance analysis to explore patterns of interpersonal tension. These analyses describe the social dynamics that surrounded Jesus's life and ministry. Key findings highlight how Jesus compassionately integrated many who were marginalized and stigmatized into his social network, how a key source of conflict between Jesus and the other religious leaders involved how to treat stigmatized people, and how interpersonal tensions contributed to but also provided unexpected sources of support during the major crisis in Jesus's life: his betrayal, crucifixion, and burial.

Because Jesus is a central figure within Christianity (Bowker 2006), many studies have examined his life, teachings, ministry, and miracles (e.g., Cotter 2010; Kaltenback 1956; Riches 1990; Stein 1994; White 2004). Scholars have also begun to investigate Jesus's interactions using social psychological frameworks (Collins 2015; Duling 1999, 2000; McClure 2016). A key perspective used in these studies is social network analysis, which is "one of the fastest growing ... areas" in social psychology (Felmlee and Faris, 2013: 439). This perspective focuses on ties between nodes, or relationships between people, in order to understand interpersonal connections, different levels of centrality and prominence within social networks, relational patterns within social networks, and the broader structure of social networks (Duling, 1999: 157; Felmlee and Faris, 2013: 440–41, 444; McClure, 2016: 3).

Jennifer McClure's previous study (2016) used basic social network analysis techniques to analyze the interpersonal connections recorded in the four Gospels of the New Testament, the earliest writings about Jesus's life (Powell, 1998: 1; White, 2004: 98). This study introduced Jesus's social network and explored his ties with three categories of people: his family and followers, the civil and religious authorities, and stigmatized people. The present article builds on McClure's previous study by using more sophisticated social network analysis techniques to investigate the relational structure of Jesus's social network more deeply. In particular, this study analyzes the clustering of actors into subgroups, the roles and positions of actors, and imbalance and interpersonal tension within the social network. Jesus was embedded in a community of social ties, and these analyses provide valuable information about the social dynamics surrounding his life and ministry.

From the outset of this study, it is necessary to discuss the nature of the content presented in the Gospels:

[The] Gospels are not biographies of Jesus but rather theological writings to certain Christian communities about Jesus's life and ministry (Powell, 1998: 7–8; White, 2004: 98). Each Gospel conveys a unique emphasis and specific theological points (Powell, 1998: 2). Although these Gospels certainly do not describe all of Jesus's interactions (Powell, 1998: 7), they are the earliest sources about Jesus's life (White, 2004: 98). Additionally, when conducting analyses of the Gospels, it is difficult to differentiate Jesus's actual words, actions, and intentions from the perspectives or interpretative frames of the authors (Hayes and Holladay, 2007: 22–24). This study views the texts of the Gospels as autonomous documents that are shaped by events, ideas, authors, and audiences (Hayes and Holladay, 2007: 23, 182; White, 2004: 116), and it analyzes these texts as they are, without differentiating the historical accounts from the authors' viewpoints (McClure, 2016: 7).

The Gospel narratives and texts analyzed in this study reflect the standard, authoritative, and orthodox depictions of Jesus from the four canonical Gospels in the New Testament (Evans and Tov 2008; Jenson 2010), not necessarily what happened historically (Ehrman 2012).

INTRODUCING JESUS'S SOCIAL NETWORK

Before proceeding to the analyses, this section reintroduces Jesus's social context and the three categories of actors in his social network (McClure 2016) and then presents this study's research questions.

Reintroducing Jesus's Social Context and Social Network

Jesus's social context. There were many difficulties and tensions in Palestine during Jesus's life (McClure, 2016: 4). The Roman Empire controlled Palestine, albeit with sometimes weak and ineffective figures (Riches, 1990: 10; Theissen, 1978: 65–66;). There were different responses to this situation. The high priest's authority was dependent on Rome, with Roman rulers sometimes appointing the high priest, and this situation required collaborating with Rome in order to maintain temple worship (Riches, 1990: 70–71; Theissen, 1978: 70); however, the Zealots violently rejected Roman rule (Riches, 1990: 99; Theissen, 1978: 61). There were also divisions among Jewish religious leaders. For example, there was some opposition between the Sadducees, who focused on temple worship, and the Pharisees, who encouraged laypeople to obey the law in their daily life through their teachings in the synagogues (Riches, 1990: 59–61). During this period, among many Jewish people, there was growing Hellenization, or “contact with non-Jewish people, languages, religions, and ideas” (McClure, 2016: 4; see Riches, 1990: 26–29), and there were “salient social divisions” among many Jewish people and non-Jews, including Samaritans, who had both Jewish and Assyrian ancestry, and Gentiles (McClure, 2016: 3; see Knoppers 2013; Riches, 1990: 17–18).

In addition, there were substantial social change and instability during this period. Many people migrated to live in newly built Roman cities, like Sepphoris and Tiberias (Riches, 1990: 21–22; Theissen, 1978: 35). The Roman military was authorized to quell unrest (Jeffers, 1999: 118–19; Josephus 1737). There were also widespread poverty and inequality (Jeffers, 1999: 181). Likely as a result of these difficulties and tensions, there was an expectation during this time that a military messiah would come, defeat the Romans, and return Palestine to the rule of the Jewish people (Theissen, 1978: 75). These expectations, however, did not reflect Jesus's understanding of his own messianic identity—preaching about the

kingdom of God, ministering to those who were disadvantaged, and offering salvation through his crucifixion (Powell, 1998: 55, 93; Riches, 1990: 109).

Jesus's family and followers. Jesus had many close and supportive relationships with his family and followers (McClure 2016). Jesus's family members include his parents (Mary and Joseph), his brothers (James, Joses, Judas, and Simon), and John the Baptist (Bauckham 1990; Duling, 2000: 9). Members of Jesus's family provided support for him early in his life (Matthew 2:13–23; Luke 2:4–7), early in his ministry (John 1:35–39, 2:1–11), and during his crucifixion (John 19:25–27). Jesus also had close relationships with his friends and followers. Examples include Jesus's twelve disciples (Matthew 10:1–4; Mark 3:14–19; Luke 6:13–16), seventy additional disciples (Luke 10:1), a group of women followers (Matthew 27:55–56; Luke 8:1–3; 23:49; John 19:25; Bauckham 2002), and the family of Martha, Mary, and Lazarus from Bethany (Luke 10:38–42; John 11). Jesus's family and followers played a key role in his social network. Jesus's ties with this group were overwhelmingly positive,¹ and of the three categories in Jesus's social network, this category was the most central, or prominent (McClure, 2016: 11–13).

Civil and religious authorities. Jesus's interactions with the civil and religious authorities were mainly marked by conflict (McClure 2016). The civil authorities in Palestine during Jesus's life were agents of the Roman Empire (Riches, 1990: 10), and Jesus interacted with many Roman authorities during his trial and crucifixion, including Herod Antipas, the tetrarch of Galilee (Luke 23; Jeffers, 1999: 127); Pontius Pilate, the Roman prefect who governed Judea (Matthew 27; Mark 15; Luke 23; John 18–19; Jeffers, 1999: 130); and members of the Roman military (Matthew 8, 27; Mark 15; Luke 7, 23).

Key religious leaders during Jesus's life included Caiaphas, the high priest, who offered annual sacrifices for atonement and whose ministry in the Temple was dependent on permission from the Roman authorities (Sakenfeld et al., 2006: 519); the Sanhedrin, “a governing council of chief priests, scribes, and religious experts” (McClure, 2016: 5; see Sakenfeld et al., 2009b: 105); the Sadducees, who supported liturgical and ritual observances at the Temple (Riches, 1990: 59; Sakenfeld et al., 2009b: 35); the Pharisees, who promoted obedience to the Jewish law and ritual purity in local synagogues and in daily life (Riches, 1990: 60–61,

¹ Ties were defined as positive or negative based on whether there were more positive or negative interpersonal connections between the two actors (McClure, 2016: 8). This statement is not meant to deny that there were negative interactions between Jesus and his family and followers (e.g., Matthew 16:23; John 7:3–5). Jesus's ties with his family and followers, however, were overwhelmingly positive because their positive connections largely outweighed their negative ones.

83); the Jewish leaders, among whom the Gospel of John typically does not differentiate (Beutler, 2006: 146–48; Powell, 1998: 121).² Many of the religious authorities challenged Jesus throughout his ministry (e.g., Matthew 22; Mark 7; Luke 5; John 9, 10), and some of them also participated in his trial (Matthew 26; Mark 14; Luke 22). The civil and religious authorities had mostly negative ties with Jesus, and they had average levels of centrality, or prominence, in Jesus’s social network (McClure, 2016:11–13).

Stigmatized people. Jesus not only taught about caring for those who were disadvantaged (e.g., Matthew 25; Luke 4, 10), but he also had many compassionate interactions with stigmatized people during his ministry (McClure, 2016: 14). People in first century Palestine were stigmatized, devalued, and excluded for many reasons (Link and Phelan, 2001: 371). Some people were stigmatized due to sickness, disability, or demon-possession, including lepers (Luke 17:11–19), the Gerasene Demoniac (Mark 5:1–20), and paralytics (Matthew 9:2–7; John 5:1–15). Others were stigmatized due to reputations as sinners, like the woman “who was a sinner” (Luke 7:36–50), tax collectors and prostitutes (Matthew 9:10; Sakenfeld et al., 2009a: 650; Sakenfeld et al., 2009b: 477), and the criminals crucified with Jesus (Luke 23:39–43). Still others were stigmatized due to race, ethnicity, or nationality, like a Samaritan woman (John 4:7–26), a Canaanite woman (Matthew 15:22–28), and Greeks (John 12:20–26). The ties between Jesus and stigmatized people were overwhelmingly positive; however, stigmatized people had low levels of centrality or prominence in Jesus’s social network (McClure, 2016: 11–13).

Research Questions

There are three analyses presented in this article that provide insight into Jesus’s social network; each analysis has corresponding research questions. The first analysis identifies subgroups of actors that are defined by cohesion or closeness (Prell, 2012: 152; Wasserman and Faust, 1994: 250–51). Because Jesus is tied with everyone in his social network, it will be interesting to see with which actors he is grouped. The first set of research questions concerns subgroups.

Subgroup research questions: What are the key subgroups or clusters of actors in Jesus’s social network? With whom is Jesus grouped? To what extent are actors in each of the three main categories—Jesus’s family and followers, the civil and religious authorities, and stigmatized people—grouped together?

² “This study refers to this group as the ‘Jewish leaders’ instead of ‘the Jews’ because the term ‘Jew(s)’ can have a derogative connotation” (McClure, 2016: 6).

Second, the blockmodeling analysis identifies different structural roles and positions based on patterns of relational ties in the social network (Scott, 2013: 121). This analysis also illustrates the structure of Jesus's social network by producing a simplified model of it (Wasserman and Faust, 1994: 375). The second set of research questions concerns roles and positions.

Blockmodeling research questions: What are the different roles and positions in Jesus's social network? Do other actors have the same role and position as Jesus? To what extent do actors in each of the three main categories—Jesus's family and followers, the civil and religious authorities, and stigmatized people—have similar roles and positions?

Third, this study conducts a balance analysis to examine patterns of positive and negative ties and to identify unbalanced relationships that contributed to interpersonal tension (Wasserman and Faust, 1994: 221). The third and final set of research questions concerns imbalance in Jesus's social network.

Balance research questions: How much imbalance is there in Jesus's social network? What key actors contribute to imbalance in Jesus's social network?

DATA AND METHODS

Data

This study utilizes social network data based on the interpersonal connections recorded in the four Gospels of the New Testament: Matthew, Mark, Luke, and John (Powell, 1998: 1).³ This data collection includes Jesus and the human actors with whom he was connected; in total, there are 121 actors.

Individuals (Jesus, Simon Peter, etc.) and concrete groups of people (the Pharisees, Sadducees, disciples of Jesus, etc.) were included as actors. Some groups were treated as actors, while individual members were also treated as

³ The data used in this article differ slightly from the data used in McClure's previous study (2016). One tie was changed; the tie between Jesus and the Jewish leaders was coded as positive in the previous study (McClure 2016); however, after further consideration, this tie is coded as negative in this article (John 5:16–23; 7:1; 8:48–59; 10:31–33). There are also six additional ties in this study that were not present in the previous study (McClure 2016): a positive tie between Mary Magdalene and Mary, the mother of Jesus (John 19:25); a positive tie between Mary, the mother of Jesus, and John, the son of Zebedee (John 19:26–27); a negative tie between the Pharisees and the tax collectors and sinners (Matthew 9:11; Mark 2:16; Luke 5:30); a positive tie between Jesus's disciples and the tax collectors and sinners (Matthew 9:10; Mark 2:15); a positive tie between the disciples of Jesus and Mary, the mother of James and Joses (Luke 24:9–10); a positive tie between the disciples of Jesus and Joanna (Luke 24:9–10). These additional ties do not change the substantive findings of McClure's previous study (2016).

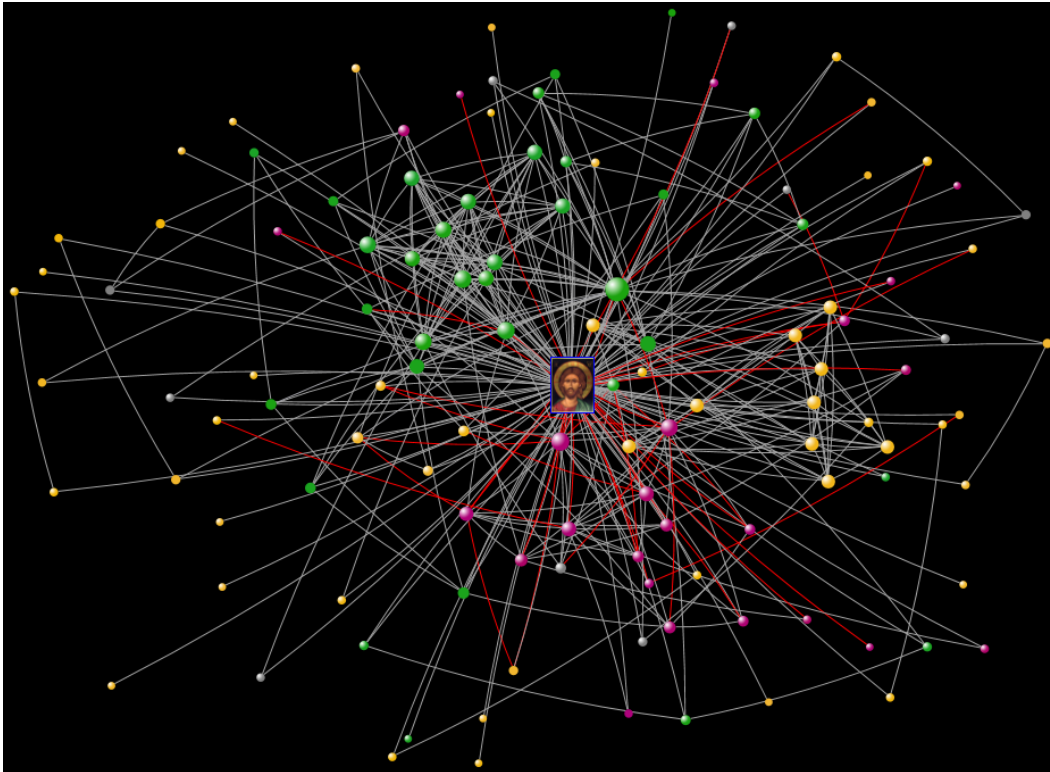
distinct actors. The most common instance includes coding the group of Jesus's disciples as a node and then coding each of the individual disciples as nodes (McClure, 2016: 7).

This study includes actors from Jesus's infancy (Matthew 1:18–2:23; Luke 2:1–40), childhood (Luke 2:41–52), and adulthood.⁴

In this study, there were four types of interpersonal connections that were coded as ties: (1) an actor interacting with another actor; (2) an actor being a member of another group (e.g., Simon, a Pharisee, mentioned in Luke 7:36–50, was tied with the Pharisees); (3) an actor responding to or acting in response to another actor, even if the actors were not both present in the passage (e.g., Jesus's disciples have a negative tie with the Jewish leaders because of their fear of the Jewish leaders in John 20:19); (4) an actor mentioning another actor, even if they were not both present in the passage (e.g., Jesus is tied to Herod in the situation where he calls Herod a “fox” in Luke 13:32). In recording ties, each tie was classified as either positive or negative, based on whether there were more positive or negative connections between the pair of actors. Each interaction, response, or mention was coded as positive or negative; group memberships were coded as positive. In Jesus's social network, there were 400 ties, 89 percent of which were positive and 11 percent of which were negative (McClure, 2016: 9).

In addition, this study collected attribute data on each actor's gender and category. Of the 121 actors in Jesus's social network, “79% [were] men, and 21% [were] women.... Of the people with whom Jesus interacted (N=120), 28.3% [were] his family and followers, 20.0% [were] civil and religious authorities, 43.3% [were] stigmatized people, and 8.3% [were] others” (McClure, 2016: 9). Appendix A lists the actors by category. A diagram of Jesus's social network is presented in Figure 1. More information about the data collection is presented in Appendix B.

⁴ By including every period of Jesus's life, this study encompasses all of Jesus's interpersonal connections, not just his adult connections.

Figure 1: Jesus's Social Network

Created with NodeXL (<http://nodexl.codeplex.com>)

Legend

Node color

Green – Jesus's family and followers
 Fuchsia – Civil and religious authorities
 Yellow-orange – Stigmatized people
 Grey – Others

Node shape

3D sphere – Men
 2D circle – Women

Tie color

Light grey – Positive interactions
 Red – Negative interactions

Node size

Based on the number of ties

Methods

This study uses three main analytical tools: the Clauset-Newman-Moore algorithm to identify subgroups, blockmodeling to examine roles and positions, and balance analysis to investigate interpersonal tension.

Subgroup analysis is an important tool within social network analysis because many social networks contain smaller clusters of actors that are cohesive, or

highly interconnected (Borgatti, Everett, and Johnson, 2013: 181). Social network analysis provides many methods for identifying cohesive subgroups (Borgatti, Everett, and Johnson 2013; Prell 2012; Scott 2013; Wasserman and Faust 1994). This study uses the Clauset-Newman-Moore algorithm within NodeXL to divide Jesus's social network into mutually exclusive subgroups (Clauset, Newman, and Moore 2004). This algorithm is based on modularity, a measure that compares the number of ties within subgroups to the number of ties between subgroups; modularity is higher when there are more ties within subgroups and fewer ties between them (Clauset, Newman, and Moore, 2004: 1). The Clauset-Newman-Moore algorithm identifies the best subgroup configuration by iteratively measuring the modularity of different subgroup configurations and selecting the configuration with the highest modularity (Clauset, Newman, and Moore, 2004: 1). There are two additional considerations for using this algorithm to identify subgroups in Jesus's social network. First, this algorithm cannot differentiate between different types of ties (i.e., positive versus negative ties); in analyzing Jesus's social network, it treats all ties, whether positive or negative, as the same. Second, Jesus's social network likely has more between-subgroup ties than other social networks because Jesus has ties with everyone else in his social network.

Secondly, this study uses blockmodeling to identify different roles and positions in Jesus's social network. Unlike the Clauset-Newman-Moore algorithm, blockmodeling can analyze multiple relations, or different types of ties (Prell, 2012: 9; Wasserman and Faust, 1994: 351, 369); when analyzing Jesus's social network, blockmodeling treats the positive and negative ties as different relations. Blockmodeling uses the concept of structural equivalence to divide actors into mutually exclusive groups, called blocks, in such a way that actors within each block have similar roles and positions within the social network (Scott, 2013: 127; Wasserman and Faust, 1994: 396). Conceptually, "actors are structurally equivalent if they have identical ties to and from all other actors in the network" (Wasserman and Faust, 1994: 356). Because this ideal is quite difficult to reach, the blockmodeling algorithm used in this study, UCINET's CONCOR, groups actors into blocks in such a way that actors are more likely to be structurally equivalent to other actors in their block than they are to actors in different blocks (Wasserman and Faust, 1994: 375). CONCOR does this grouping by iteratively testing different arrangements and selecting the arrangement where actors within each block have the highest structural equivalence (Scott, 2013: 126–27). This study uses an interactive form of CONCOR that allows users to determine which blocks to divide further.

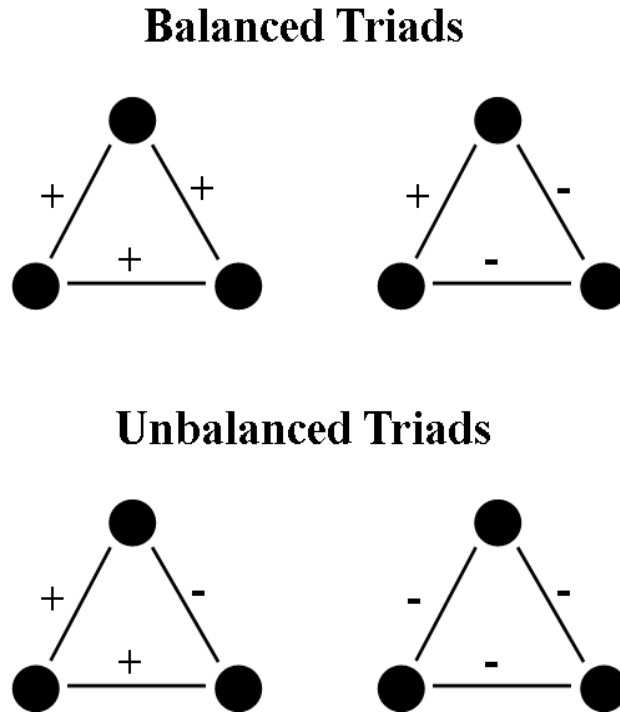
Once CONCOR has divided the actors into different blocks, it is possible to depict the structure of the social network. First, each block of structurally equivalent actors is depicted as a node (Wasserman and Faust, 1994: 391). Second, a criterion is used to determine whether there are ties both between

blocks and within blocks. This study uses a modified α density criterion, which is based on the density of ties, or “the proportion of possible ties that actually exist” (McClure, 2016: 9; Prell, 2012: 166). The α density criterion stipulates that, for each relation, there is a tie between two blocks when the density of ties between the two blocks is greater than or equal to α , or the density of that relation in the whole social network (Wasserman and Faust, 1994: 400). This study modifies this criterion to require the density to be at least 50 percent more than α .⁵ In Jesus's social network, the density of positive ties is 0.049, and the criterion for positive ties is 0.074. The density of negative ties is 0.006, and the criterion for negative ties is 0.009.

The final analysis focuses on structural balance. The main idea behind balance is that if two actors “like” each other, they should similarly “like” or “dislike” other actors (Wasserman and Faust, 1994: 221). Balance analysis requires both positive and negative relational data (Wasserman and Faust, 1994: 222), and it focuses on groups of three actors, called triads, all of which are tied together (Felmlee and Faris, 2013: 448). Conceptually, balance exists where all three of the ties in the triad are positive (e.g., the friend of my friend is my friend) or where one tie is positive and the other two ties are negative (e.g., the enemy of my friend is my enemy). Triads are unbalanced, however, where there are two positive ties and one negative tie (e.g., the enemy of my friend is my friend) and where there are three negative ties (e.g., the enemy of my enemy is my enemy). Mathematically, triads are balanced if the three ties' signs have a positive product; for example, $(+)(+)(+) = (+)$, and $(+)(-)(-) = (+)$. Triads are unbalanced, however, if the product of the three ties' signs is negative; for example, $(+)(+)(-) = (-)$, and $(-)(-)(-) = (-)$ (Wasserman and Faust, 1994: 223–25). Figure 2 presents diagrams of balanced and unbalanced triads. This analysis identifies unbalanced triads, which can contribute to interpersonal tension in a social network (Wasserman and Faust, 1994: 221).

⁵ If this study were to use the normal α density criterion, there would be some ties among blocks that were only based on one tie among the actors. In this study, using a higher criterion ensures that the ties among the blocks are based on multiple ties among the actors.

Figure 2: Balanced and Unbalanced Triads



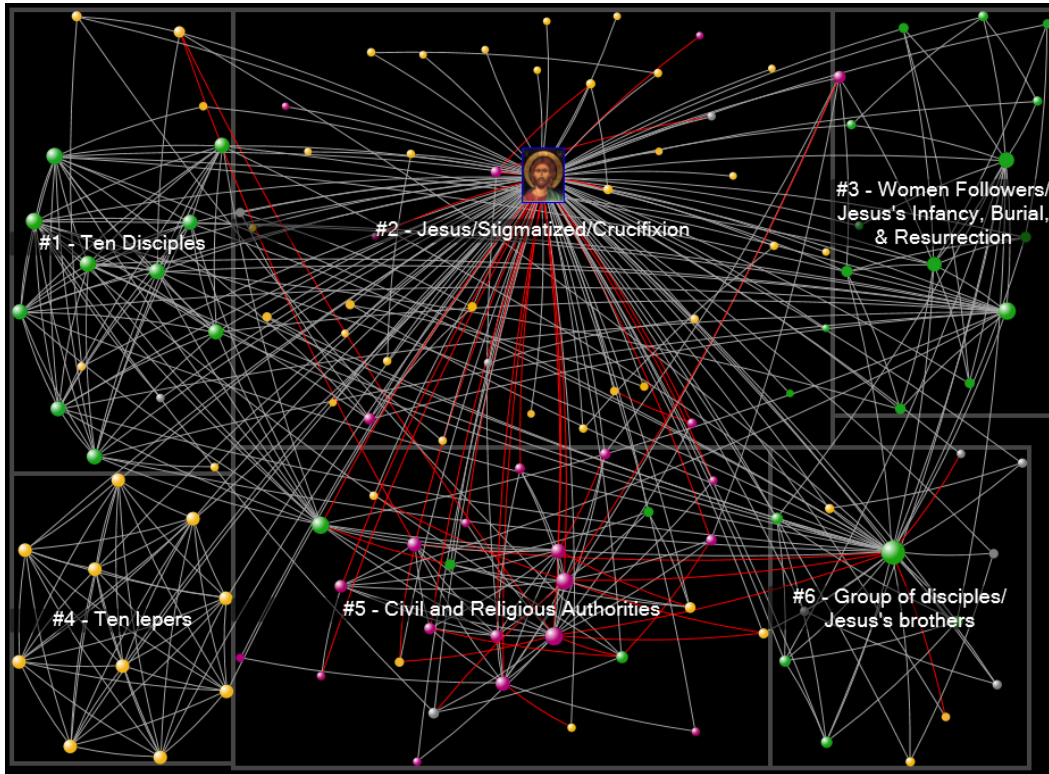
Source: Wasserman and Faust, 1994: 224.

RESULTS

Subgroups

The first analysis identified six subgroups, or clusters of actors (Borgatti, Everett, and Johnson, 2013: 181), within Jesus’s social network using the Clauset-Newman-Moore algorithm (Clauset, Newman, Moore 2004) in NodeXL. Figure 3 depicts these subgroups, and Appendix C lists the actors by subgroup.

Figure 3: Subgroups in Jesus's Social Network



Created with NodeXL (<http://nodexl.codeplex.com>)

Legend

Node color

- Green – Jesus's family and followers
- Fuchsia – Civil and religious authorities
- Yellow-orange – Stigmatized people
- Grey – Others

Tie color

- Light grey – Positive interactions
- Red – Negative interactions

Node size

Based on the number of ties

Node shape

- 3D sphere – Men
- 2D circle – Women

The first subgroup was mainly comprised of Jesus's family and followers. The main actors in this subgroup were ten of Jesus's disciples, coded as individuals (Matthew 10:1–4; Mark 3:14–19; Luke 6:13–16); John, son of Zebedee, and Judas Iscariot were not classified into this subgroup. Many of the other actors in this subgroup were people who interacted with individual disciples. Examples included the boy with five loaves and two fish who interacted with Andrew (John 6:8–9); the Greeks who interacted with Philip (John 12:20–21); Simon Peter's mother-in-law, who interacted with her son-in-law (Matthew 8:14; Mark 1:29–30);

Luke 4:38); tax collectors and sinners who interacted with Matthew, also called Levi (Mark 2:15; Luke 5:29). The ties among actors in this subgroup were 100 percent positive and quite dense (density = 0.425).⁶

Key figures in the second subgroup included Jesus and many stigmatized people. Seventy-one percent of the actors in this subgroup were stigmatized people. Examples included many blind men (Matthew 9, 20; Mark 8, 10; Luke 18); many demon-possessed men (Matthew 8, 12; Mark 5; Luke 4, 8, 11); many others whom Jesus healed of various ailments, like the woman with an issue of blood (Matthew 9; Mark 5; Luke 8), the man with dropsy (Luke 14), and the nobleman's sick son (John 4); many non-Jewish actors, like a Samaritan woman (John 4) and the Syro-Phoenician woman and her daughter (Matthew 15; Mark 7). Another theme in this subgroup concerned Jesus's crucifixion; this subgroup included the two criminals with whom Jesus was crucified and the soldiers of Pilate (Matthew 27; Mark 15; Luke 23; John 19). Not including Jesus, actors in this subgroup had very few ties; the highest number of ties was only six. Forty-eight percent of these actors were only tied with Jesus, and 30 percent were only tied to Jesus and one other person. Non-stigmatized actors that were classified into this subgroup were likely placed here because of their few ties. The ties among actors in this subgroup were mainly positive (84%) but not very dense (density = 0.066). This subgroup was mainly held together by Jesus; of the fifty-four ties among members in this subgroup, he was involved in forty (74%) of them.

The third subgroup mainly included Jesus's family and followers, and there are three major themes that characterized this subgroup. First, it contained the women who followed Jesus and provided for him throughout his ministry: Mary Magdalene, Joanna, and Susanna (Luke 8:2–3). Second, some actors in this subgroup interacted with Jesus during his infancy: Mary the mother of Jesus, Joseph, shepherds, Simeon, and wise men (Matthew 1–2; Luke 2). Many of the actors in this subgroup were also present at Jesus's crucifixion, burial, and/or resurrection: Joseph of Arimathea; John, son of Zebedee; Mary, the mother of James and Joses; Mary Magdalene; Salome; Mary, the mother of Jesus; Mary, the wife of Clopas; and the sister of Mary, the mother of Jesus (Matthew 27:55–28:1; Mark 15:42–16:1; Luke 24:10; John 19:25–26; 20:1–10). The ties among actors in this subgroup were positive and moderately dense (density = 0.264).

The fourth subgroup contained ten lepers, whom Jesus healed in Luke 17, one of whom was a Samaritan. All of the people in this group were stigmatized due to their leprosy, and one was doubly stigmatized due to being a Samaritan (Luke 17:16, 18). This subgroup was the one into which the second largest number of

⁶ Density is defined as “the proportion of possible ties that actually exist” (McClure, 2016: 9; see Prell, 2012: 166).

stigmatized people were classified. All of these lepers had positive ties with each other (density = 1.0).

The fifth subgroup included 71 percent of the civil and religious authorities. Examples of civil authorities in this subgroup were Herod Antipas and Pontius Pilate; examples of religious authorities were high priests, chief priests, elders, Jewish leaders, lawyers, Pharisees, Sadducees, scribes, and teachers of the law. Judas Iscariot, who betrayed Jesus to the religious leaders (Matthew 26; Mark 14; Luke 22; John 18), was also classified into this subgroup. Other non-authority actors in this subgroup were likely classified here because of their ties with civil and religious authorities: John the Baptist with Herod Antipas (Matthew 14) and with the Pharisees and Sadducees (Matthew 3); John the Baptist's disciples with the Pharisees (Mark 2) and with the Jewish leaders (John 3); Mary, Martha, and Lazarus of Bethany with the Jewish leaders (John 11); the man blind from birth with the Pharisees and Jewish leaders (John 9); the woman caught in adultery with the scribes and Pharisees (John 8); the man with an infirmity with the Jewish leaders (John 5); and Barabbas with Pontius Pilate (Matthew 27). Ties among actors in this subgroup were moderately dense (density = 0.171), and 78 percent of the ties were positive. Most of the negative ties among members of this subgroup involved a civil or religious authority and a non-authority.

The sixth and final subgroup was mostly comprised of Jesus's family and followers, and it included two key groups: the disciples of Jesus, coded as a group, and Jesus's four brothers, James, Joses, Judas, and Simon. The others classified into this subgroup were actors who interacted with the disciples as a group: the man whom Jesus raised from the dead and his widow mother (Luke 7); the epileptic and his father (Matthew 17; Mark 9; Luke 9); Cleopas and the person with him on the road to Emmaus (Luke 24); the woman who anointed Jesus from an alabaster flask before his crucifixion (Matthew 26); and children (Matthew 19; Mark 10; Luke 18). Ties within this subgroup had a moderate level of density (0.269), and they were overwhelmingly (90%) positive.

In summary, Jesus's social network had six subgroups, and actors from each category were likely to be members of the same subgroup. Jesus's family and followers were mostly in the first, third, and sixth subgroups, the civil and religious authorities were mostly in the fifth subgroup, and stigmatized people were mostly in the second and fourth subgroups.⁷ Perhaps the most interesting finding from the subgroup analysis was that Jesus was grouped with stigmatized people, not his family and followers. From a social network perspective, Jesus's placement in the second subgroup likely reflected how he largely provided the attachments and cohesion for that subgroup and how stigmatized people within

⁷ A chi-square test indicates that the actors from the same category—Jesus's family and followers, the civil and religious authorities, or stigmatized people (McClure 2016)—were more likely to be classified into the same subgroup ($\chi^2 = 96.0$, d.f. = 10, $p < 0.001$).

Jesus's social network, on average, had very few ties beyond their ties to Jesus (McClure, 2016: 12–13).

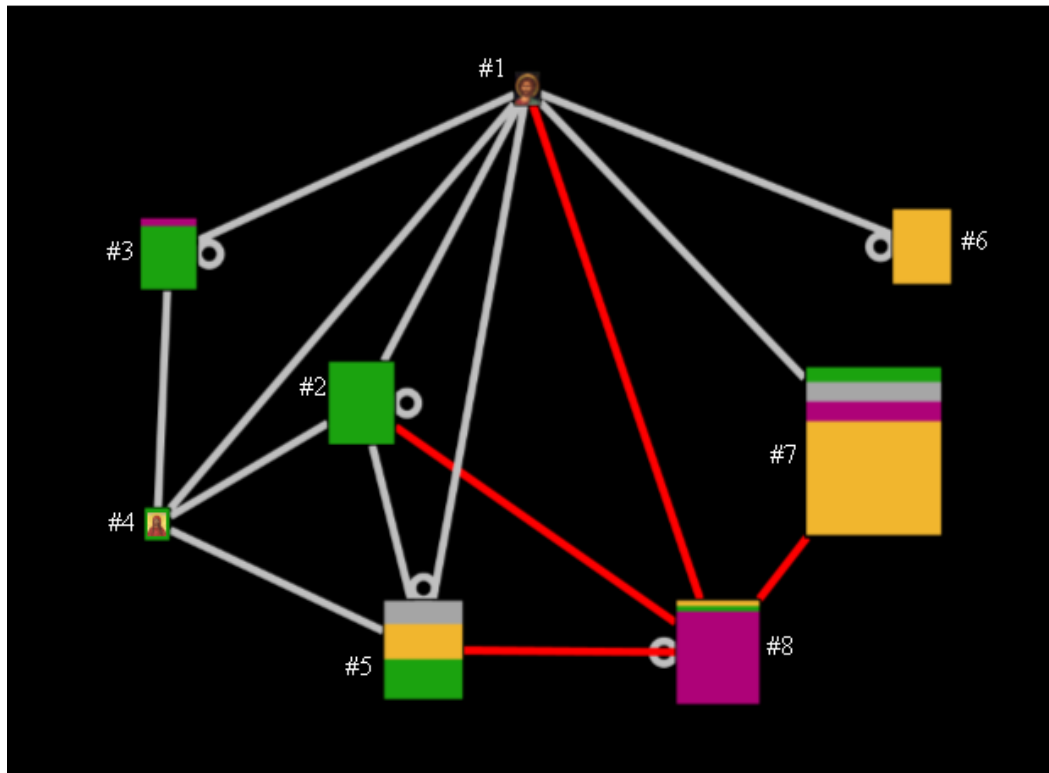
Blockmodeling

In exploring different roles and positions in Jesus's social network, this study identified eight blocks using an interactive version of CONCOR in UCINET, which maximizes the structural equivalence of actors within each block (Scott, 2013: 126–27). Actors are listed by block in Appendix D. Blockmodeling provides a simplified structure of the social network, and the simplified structure of Jesus's social network is illustrated in Figure 4. Appendix E presents the matrices of the densities of ties within and between the blocks and reduced matrices of the block ties.

The blocks varied in their size and composition. The first block only included Jesus. The second block had twelve actors: the disciples of Jesus (coded as a group) and eleven of the twelve disciples (coded as individuals). Judas Iscariot, the disciple who betrayed Jesus (Matthew 26; Mark 14; Luke 22; John 18), was excluded from this block. The second block was designated as the “disciples.” The third block included nine actors, many of whom were Jesus's family and followers; these actors provided Jesus with protection and worship during his infancy, financial support during his ministry, emotional support during his crucifixion, and materials for burial (Matthew 2:11–33; 27:55–56; Luke 2:4–20; 8:2–3; 23:50–54; John 19:25). The actors in the third block were the “providers.” The fourth block only included Mary Magdalene. The fifth block contained seventeen actors; 41 percent were Jesus's family and followers, 35 percent were stigmatized people, and 24 percent were others. Jesus's family and followers within this block included his mother and brothers, as well Joanna and Mary, the mother of James and Joses (Matthew 27:56; Luke 8:2–3). Many of the other actors in this block had positive interactions with Jesus that involved healings (Matthew 17; Mark 7; Luke 7; John 9) or revelations of spiritual insight (Luke 24; John 4), and some of these interactions resulted in stigmatized people and “others” supporting Jesus and telling people about him (Luke 24; John 4, 9). The actors in the fifth block were the “supporters.” The sixth block contained the ten lepers whom Jesus healed in Luke 17. The seventh block was the largest with fifty-two actors, and it was mostly comprised of stigmatized people and others with few ties in the social network. The actors in this block were the “marginalized.” The eighth and final block included many of the civil and religious authorities who opposed Jesus (Herod Antipas, Pontius Pilate, the high priests and chief priests, elders, scribes, the Pharisees, the Sadducees, the Jewish leaders, etc.), as well as Judas Iscariot, who betrayed Jesus to the religious leaders (Matthew 26; Mark 14; Luke 22; John 13, 18), and the criminal who

“blasphemed” Jesus during their crucifixion (Luke 23:39). The actors in this block were the “antagonists.”

Figure 4: Blockmodel of Jesus’s Social Network



Created with NodeXL (<http://nodexl.codeplex.com>)

Legend

Block coloration

- Based on the composition of each block
- Green – Jesus’s family and followers
- Fuchsia – Civil and religious authorities
- Yellow-orange – Stigmatized people
- Grey – Others

Tie color

- Light grey – Positive interactions
- Red – Negative interactions

Note:

Loops indicate ties within the block

Block size is based on the number of actors in each block

These blocks had unique ties. Jesus had ties with all of the blocks; he had positive ties with the “disciples,” “providers,” Mary Magdalene, “supporters,” “ten lepers,” and “marginalized” and a negative tie with the “antagonists.” There were many ties among the three blocks that included many of Jesus’s family and followers (blocks 2, 3, and 4). First, there were positive ties within the “disciples”

and the “providers.” While these two blocks were not tied together, they were connected by Mary Magdalene. The “supporters” mainly included Jesus’s family and followers and stigmatized people, and actors in this block had positive ties with each other, the “disciples,” and Mary Magdalene. Two other blocks also contained many stigmatized people—the “ten lepers” and the “stigmatized.” Both of these blocks had positive ties with Jesus. Although the ties among the “antagonists” were positive, the “antagonists” were the main source of negative ties in Jesus’s social network. They had negative ties with Jesus, the “disciples,” the “supporters,” and the “marginalized.”

In summary, Jesus’s social network had eight roles. Jesus had a unique role due to his connections with all of the actors. Jesus’s family and followers were mainly classified as “disciples” and “providers;” these blocks were connected by Mary Magdalene. The “supporters” included Jesus’s family and followers and stigmatized people, and other stigmatized people were classified as the “ten lepers” and the “marginalized.” While the “supporters” had many ties within Jesus’s social network, the other two blocks of stigmatized people mainly had positive connections with Jesus. Most of the civil and religious authorities were “antagonists,” and this block had negative ties with Jesus, some of his family and followers, and some stigmatized people. Actors from the same categories tended to be classified into the same blocks.⁸

Balance

The final analysis in this article examined balance among triads, or groups of three actors, all of which were tied together (Felmlee and Faris, 2013: 448), in order to identify patterns of interpersonal tension in Jesus’s social network. The configurations of balanced and unbalanced triads are depicted in Figure 2 (Wasserman and Faust, 1994: 224). In Jesus’s social network, there were 798 triads. Of these, thirty-seven (4.6%) were unbalanced. Jesus was involved in 276 total triads, twenty-eight (10.1%) of which were unbalanced. Jesus was involved in most (76%) of the unbalanced triads in his network. Thirty-seven other actors were involved in unbalanced triads, and each was involved in, on average, two to three unbalanced triads.

Examining the unbalanced triads revealed patterns of tension in Jesus’s social network. Three main patterns were related to Jesus’s betrayal, crucifixion, and burial. First, much of the imbalance related to Jesus’s betrayal involved Judas Iscariot, the disciple who betrayed Jesus to the religious authorities who wanted to kill him (Matthew 26; Mark 14; Luke 22; John 18). Jesus had a negative tie with

⁸ A chi-square test indicates that actors from the same category—Jesus’s family and followers, the civil and religious authorities, or stigmatized people (McClure 2016)—were more likely to be classified into the same block ($\chi^2 = 126.5$, d.f. = 12, $p < 0.001$).

Judas Iscariot; however, Jesus also had positive ties with the other disciples, and these disciples had positive ties with Judas Iscariot. Judas also contributed to imbalance by having positive ties with Jesus's disciples and with some religious leaders who criticized Jesus's disciples (Matthew 9, 12; Mark 2; Luke 5, 19). By collaborating with the religious leaders in order to betray Jesus, Judas created tension among Jesus and his disciples.

Second, other unbalanced triads were related to Jesus's crucifixion. Pontius Pilate condemned Jesus to crucifixion, even though his wife discouraged him from doing so (Matthew 27:19). In addition, the centurion who participated in Jesus's crucifixion and who confirmed Jesus's death for Pontius Pilate also came to believe that Jesus "was the Son of God" (Matthew 27:54; Mark 15:39–45). During Jesus's crucifixion, there was also a triad with three negative ties that included Jesus, the criminal who "blasphemed" him, and the soldiers of Pilate who crucified them (Luke 23:32–33, 39).

A third pattern of imbalance in Jesus's social network was related with Jesus's burial and involved Joseph of Arimathea and Nicodemus, two religious leaders who buried Jesus's body after his crucifixion (Matthew 27; Mark 15; Luke 23; John 19). Despite the religious leaders' mostly negative ties with Jesus, these two men supported Jesus, albeit secretly (John 3:1–2; 19:38–39). This imbalance led to tension with the religious leaders' widespread opposition of Jesus. Unbalanced triads contribute to tension within social networks, and much of the imbalance in Jesus's social network was related to his betrayal, crucifixion, and burial.

DISCUSSION AND CONCLUSION

This study has examined the structure of Jesus's social network using subgroup, blockmodeling, and balance analyses. These analyses provide additional information about the three categories of actors in Jesus's social network—Jesus's family and followers, the civil and religious authorities, and stigmatized people—and Jesus, as well. After discussing these things, this section turns to the limitations of this study.

Jesus's family and followers were prominent in his social network, and they provided support for him throughout his life and ministry (McClure 2016). The structure of Jesus's social network reflects their importance. This category contained three cohesive subgroups: the first involved ten of the disciples, when coded as individuals; the second involved many of the women who supported Jesus throughout his ministry, as well as key figures from Jesus's infancy, burial, resurrection; the third included the disciples of Jesus, when coded as a group, and Jesus's brothers. The cohesion within this category provided Jesus with a strong support network as many of his family and followers collaborated to help him during his infancy (Matthew 1–2; Luke 2), his ministry (Matthew 10; Luke 8:2–

3), and his crucifixion and burial (Luke 23:55–56; John 19:25–27). The actors in this category also had three main roles: the “disciples” served alongside Jesus (Matthew 10), the “providers” supplied Jesus with financial, material, and emotional support (Luke 8:2–3, 23:55–56; John 19:25–27), and the “supporters” followed Jesus and told others about him (Luke 8:2–3, 24:33–35; John 4, 9). Mary Magdalene also helped to connect the different roles among Jesus’s family and followers. These roles suggest that, while Jesus’s family and followers overwhelmingly supported him (McClure 2016), they did so in different ways. Lastly, there was imbalance among Jesus and his disciples because Judas Iscariot betrayed him to the religious leaders instead of supporting him (Matthew 26; Mark 14; Luke 22; John 18). Examining Jesus’s social network in more depth indicates that Jesus’s family and followers provided him with a strong support network and many forms of support; however, by betraying Jesus, Judas Iscariot caused tension among Jesus and his disciples.

Jesus’s ties with the civil and religious authorities were mainly negative, and his relationships with them were characterized by conflict (McClure 2016). In Jesus’s social network, the civil and religious authorities were mostly involved in one subgroup, which indicated that, despite the ideological conflicts among the civil and religious leaders in first century Palestine (Jeffers 1999; Riches 1990; White, 2004: 75–80), the civil and religious authorities were closely interconnected. This cohesion, despite ideological differences, is best understood through the role that many of the civil and religious authorities played in Jesus’s social network. As “antagonists,” many of the civil and religious authorities overcame their ideological differences in order to oppose Jesus and his ministry. For example, the Pharisees and Sadducees, who often disagreed with each other (Riches, 1990: 59; White, 2004: 78), together challenged Jesus to provide “a sign from heaven” (Matthew 16:1–4). In addition, the Pharisees collaborated with the chief priests, who served in the Temple and generally belonged to the Sadducees (Achteimer et al., 1996: 881), to arrest Jesus (John 7:32; 11:57; 18:3). Within the structure of Jesus’s social network, the civil and religious authorities were mostly united in their opposition to Jesus and his ministry. A few of the civil and religious leaders, however—the wife of Pilate, a centurion, Joseph of Arimathea, and Nicodemus—supported Jesus (Matthew 27:19, 54; Mark 15:39; Luke 23:47; John 19:38–39), despite their ties to other authorities who opposed him. Their support of Jesus created tension within the civil and religious authorities’ widespread opposition toward Jesus.

Jesus also interacted with many people who were stigmatized, excluded, and devalued in his society (Link and Phelan, 2001: 371). Despite stigmatized people’s low levels of centrality and prominence in Jesus’s social network, Jesus had many positive ties with them (McClure 2016). Looking deeper into the structure of Jesus’s social network, stigmatized people were mainly classified into

two subgroups; one was comprised of the ten lepers whom Jesus healed (Luke 17), and the other included many stigmatized people with very few ties, some of whom were only connected with Jesus. They were classified into three roles in Jesus's social network: the "supporters," the "ten lepers," and the "marginalized." The blockmodeling analyses indicated that Jesus was an important source of positive ties particularly for the ten lepers and many of the stigmatized people who were "marginalized." Very few stigmatized people contributed to imbalance in Jesus's social network. While Jesus instructed and encouraged people to care for those who were marginalized in society (e.g., Matthew 25:31–46; Luke 10:30–37), he also showed compassion toward stigmatized people by integrating them into his social network, as the subgroup analysis powerfully visualized.

These analyses also provide additional considerations about Jesus's role within his social network and about his life and ministry more broadly. First, in the subgroup analysis, Jesus was grouped with mostly stigmatized people, many of whom had few ties beyond their tie to Jesus. This subgroup was the least cohesive of the six subgroups in Jesus's social network, and actors in this subgroup would have been largely disconnected if Jesus were not included in it. The subgroup analysis underscores the importance of Jesus's connections with many people who were otherwise devalued and excluded in first century Palestine (Link and Phelan, 2001: 371; McClure 2016); these interactions reflected and reinforced his teachings about serving those who were on the fringes of society (e.g., Matthew 25:31–46; Luke 10:30–37). Second, the blockmodeling analysis indicated an important difference between Jesus and many of the civil and religious authorities—"the antagonists." While Jesus had many positive and compassionate connections with the "marginalized" in his social network, the "antagonists" had many negative connections with them. While the "antagonists" opposed Jesus and his followers in a variety of situations (Matthew 9, 22; Luke 20; John 9, 10), a key source of conflict involved Jesus's interactions with stigmatized people. Examples include the scribes and Pharisees criticizing Jesus for eating with tax collectors and sinners (Mark 2:15–17; Luke 5:30–32); the scribes and Pharisees challenging Jesus to condemn a woman caught in adultery (John 8:2–11); the Pharisees and Jewish leaders excommunicating a blind man whom Jesus healed (John 9); and the Pharisees planning to kill Jesus because he healed a man with a withered hand on the Sabbath (Matthew 12:9–14). Jesus differed from the "antagonistic" religious leaders by having compassionate interactions with stigmatized people (McClure, 2016: 13), many of whom were "marginalized," and this created conflict within his social network (e.g., Matthew 9; Mark 2; Luke 5; John 9). Finally, much of the imbalance in Jesus's social network was related to his betrayal, crucifixion, and burial—key events in the climax and conclusion of the Gospels (Powell, 2009: 91–92). This tension

resulted not only in Jesus's betrayal but also in unexpected sources of support during his crucifixion and burial.

This study has a number of limitations. First, as evangelistic writings about Jesus, the Gospels are not objective or comprehensive biographies of Jesus's life (Powell, 2009: 83, 85); they do not contain information from every stage of Jesus's life (Powell, 1998: 7), and they "do not record all or even most of the [interpersonal connections within] Jesus's social network" (McClure, 2016: 15). Although one cannot construct Jesus's entire social network from the Gospels, these sources provide "the oldest accounts of Jesus's life and ministry" (McClure, 2016: 15; see White, 2004: 98). In addition, the accounts in the Gospels largely reflect the emphases and perspectives of their authors (Powell 1998), not necessarily how things occurred historically (Hayes and Holladay 2007). While this study cannot differentiate between the authors' accounts and historical fact, it presents how the Gospels portrayed the interpersonal connections in Jesus's social network (McClure, 2016: 15).

There are opportunities for further research. Biblical scholars have observed many similarities and differences among the Gospels (e.g., Powell 1998), and it would be intriguing to develop social networks for the four Gospels and to use social network analysis to examine the similarities and differences among them. Such a study would evaluate how well social network analysis can identify biblical scholars' insights about the Gospels and explore whether social network analysis could identify new themes in the Gospels. In addition, these studies on Jesus's social network have many theological implications and faith-related applications. Moving forward, it would be beneficial to present theological reflections and practical applications from this study through more theological and general-audience outlets.

In conclusion, this study built on McClure's previous study (2016) to examine the structure of Jesus's social network in more depth. This study used subgroup analyses to identify cohesive communities, blockmodeling to describe different roles and positions, and balance analyses to examine interpersonal tension within Jesus's social network. These analyses demonstrate how Jesus was embedded into a community of ties and how these social dynamics shaped his life and ministry. The subgroup analysis underscored Jesus's compassion for those who were stigmatized and marginalized by society. He encouraged people to care for the stigmatized through his teachings and also modeled how to interact with them in compassionate ways through integrating them into his social network. The blockmodeling analysis demonstrated that a key source of Jesus's conflict with the religious leaders involved his positive and compassionate connections with stigmatized people, many of whom were on the margins of society and some of whom were treated poorly by the more "antagonistic" religious leaders. Lastly, the balance analyses indicated how interpersonal tensions surrounded the climax

of the Gospels and the major crisis in Jesus's life—his betrayal, crucifixion, and burial (Powell, 2009: 91–92).

REFERENCES

- Achtemeier, Paul J., Roger S. Boraas, Michael Fishbane, PHEME PERKINS, William O. Walker, Jr., with the Society of Biblical Literature, eds. 1996. *The HarperCollins Bible Dictionary*, Revised Edition. New York: HarperCollins Publishers.
- Aland, Kurt, ed. 1985. *Synopsis of the Four Gospels: Revised Standard Version*, 2nd Edition. New York: American Bible Society.
- Bauckham, Richard. 1990. *Jude and the Relatives of Jesus in the Early Church*. Edinburgh: T&T Clark.
- Bauckham, Richard. 2002. *Gospel Women: Studies of the Named Women in the Gospels*. Grand Rapids, MI: Wm. B. Eerdmans Publishing Co.
- Beutler, Johannes. 2006. *Judaism and the Jews in the Gospel of John*. Rome: Editrice Pontificio Instituto Biblico.
- Borgatti, Stephen P., Martin G. Everett, and Jeffrey C. Johnson. 2013. *Analyzing Social Networks*. Thousand Oaks, CA: SAGE Publications, Inc.
- Bowker, John. 2006. *World Religions: The Great Faiths Explored & Explained*. New York: DK Publishing, Inc.
- Clauset, Aaron, M. E. J. Newman, and Cristopher Moore. 2004. "Finding Community Structure in Very Large Networks." *Physical Review E* 70(6): 1–6.
- Collins, Randall. 2015. "Jesus in Interaction: The Microsociology of Charisma." *Interdisciplinary Journal of Research on Religion* 11(8): 1–29.
- Cotter, Wendy J., CSJ. 2010. *The Christ of the Miracle Stories: Portrait through Encounter*. Grand Rapids, MI: Baker Academic.
- Duling, Dennis C. 1999. "The Jesus Movement and Social Network Analysis (Part I: The Spatial Network)." *Biblical Theology Bulletin* 29(4): 156–75.
- Duling, Dennis C. 2000. "The Jesus Movement and Social Network Analysis (Part II: The Social Network)." *Biblical Theology Bulletin* 30(1): 3–14.
- Ehrman, Bart D. 2012. *Did Jesus Exist? The Historical Argument for Jesus of Nazareth*. New York: HarperOne.
- Evans, Craig A., and Emanuel Tov, eds. 2008. *Exploring the Origins of the Bible: Canon Formation in Historical, Literary, and Theological Perspective*. Grand Rapids, MI: Baker Academic.
- Felmlee, Diane, and Roger Faris. 2013. "Interaction in Social Networks." In *Handbook of Social Psychology*, 2nd Edition, edited by John DeLamater and Amanda Ward, 439–64. New York: Springer.
- Glover, Carl A. 1939. *With the Twelve*. Nashville, TN: Cokesbury Press.
- Harrison, Chris. 2008. "Visualizing the Bible." Retrieved September 24, 2013, from www.chrisharrison.net/index.php/Visualizations/BibleViz.
- Hayes, John H., and Carl R. Holladay. 2007. *Biblical Exegesis: A Beginner's Handbook*, 3rd Edition. Louisville, KY: Westminster John Knox Press.
- Jeffers, James S. 1999. *The Greco-Roman World of the New Testament Era: Exploring the Background of Early Christianity*. Downers Grove, IL: Inter Varsity Press.

- Jenson, Robert W. 2010. *Canon and Creed*. Louisville, KY: Westminster John Knox Press.
- Josephus, Flavius. 1737. *The Works of Flavius Josephus, the Learned and Authentic Jewish Historian and Celebrated Warrior. With Three Dissertations Concerning Jesus Christ, John the Baptist, James the Just, God's Command to Abraham, &c. and Explanatory Notes and Observations*, translated by William Whiston. Baltimore: Armstrong & Berry.
- Kaltenbach, John E. 1956. *The Life of Jesus: A Consecutive Narrative Constructed from the Revised Standard Version New Testament*. New York: Thomas Nelson & Sons.
- Knoppers, Gary N. 2013. *Jews and Samaritans: The Origins and History of Their Early Relations*. New York: Oxford University Press.
- Link, Bruce G., and Jo C. Phelan. 2001. "Conceptualizing Stigma." *Annual Review of Sociology* 27: 363–85.
- McClure, Jennifer M. 2016. "Introducing Jesus's Social Network: Support, Conflict, and Compassion." *Interdisciplinary Journal of Research on Religion* 12(5): 1–22.
- Powell, Mark Allan. 1998. *Fortress Introduction to the Gospels*. Minneapolis, MN: Augsburg Fortress.
- Powell, Mark Allan. 2009. *Introducing the New Testament: A Historical, Literary, and Theological Survey*. Grand Rapids, MI: Baker Academic.
- Prell, Christina. 2012. *Social Network Analysis: History, Theory, and Methodology*. Thousand Oaks, CA: SAGE Publications, Inc.
- Riches, John. 1990. *The World of Jesus: First-century Judaism in Crisis*. New York: Cambridge University Press.
- Römhild, Christoph. 2008. "Proper Nouns in the King James Bible." Christoph Römhild [producer]. Linton Freeman [distributor]. Retrieved September 24, 2013 from <http://moreno.ss.uci.edu/data.html>.
- Sakenfeld, Katharine Doob, Samuel E. Balentine, Kah-Jin Jeffrey Kuan, Eileen Schuller, Brian K. Blount, Joel B. Green, and PHEME PERKINS, eds. 2006. *The New Interpreter's Dictionary of the Bible*, Vol. 1: A—C. Nashville, TN: Abingdon Press.
- Sakenfeld, Katharine Doob, Samuel E. Balentine, Kah-Jin Jeffrey Kuan, Eileen Schuller, Brian K. Blount, Joel B. Green, and PHEME PERKINS, eds. 2009a. *The New Interpreter's Dictionary of the Bible*, Vol. 4: Me—R. Nashville, TN: Abingdon Press.
- Sakenfeld, Katharine Doob, Samuel E. Balentine, Kah-Jin Jeffrey Kuan, Eileen Schuller, Brian K. Blount, Joel B. Green, and PHEME PERKINS, eds. 2009b. *The New Interpreter's Dictionary of the Bible*, Vol. 5: S—Z. Nashville, TN: Abingdon Press.
- Scott, John. 2013. *Social Network Analysis*, 3rd Edition. Thousand Oaks, CA: Sage Publications, Inc.
- Stein, Robert H. 1994. *The Method and Message of Jesus' Teachings*, Revised Edition. Louisville, KY: Westminster John Knox Press.
- Theissen, Gerd. 1978. *Sociology of Early Palestinian Christianity*, translated by J. Bowden. Philadelphia: Fortress Press.
- Wasserman, Stanley, and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press.
- White, L. Michael. 2004. *From Jesus to Christianity*. New York: Harper Collins Publishers, Inc.

Appendix A: Actors by Category

Category #1—Jesus

1. Jesus

Category #2—Jesus's family and followers

1. Andrew
2. Anna
3. Bartholomew (also known as Nathanael)
4. Disciples of Jesus
5. James, brother of Jesus
6. James, son of Alphaeus
7. James, son of Zebedee
8. Joanna
9. John, son of Zebedee (also called the disciple whom Jesus loved)
10. John the Baptist
11. Joseph
12. Joses, brother of Jesus
13. Judas Iscariot
14. Judas, brother of Jesus
15. Martha of Bethany
16. Mary Magdalene
17. Mary, mother of James and Joses
18. Mary, mother of Jesus
19. Mary of Bethany
20. Mary, wife of Cleopas
21. Matthew (also known as Levi)
22. Philip
23. Salome (also the mother of James and John, the sons of Zebedee)
24. Seventy others
25. Shepherds
26. Simeon
27. Simon Peter
28. Simon, brother of Jesus
29. Simon, the Canaanite (also known as Simon the zealot)
30. Sister of Mary, the mother of Jesus
31. Susanna
32. Thaddeus (also known as Judas, son of James or Judas, not Iscariot)
33. Thomas
34. Wise men (also known as Magi)

Category #3—Civil and religious authorities

1. Annas
2. Caiaphas
3. Captains of the temple

4. Centurion (Mark 15; Luke 23)
5. Centurion (Matthew 8; Luke 7)
6. Chief Priests
7. Elders
8. Herod Antipas
9. Herodians
10. Jairus
11. Jewish leaders
12. Joseph of Arimathea
13. Lawyers
14. Nicodemus
15. Pharisees
16. Pontius Pilate
17. Rich young ruler
18. Ruler of the synagogue
19. Sadducees
20. Scribes
21. Simon, a Pharisee
22. Soldiers of Pilate
23. Teachers of the law
24. Wife of Pilate

Category #4—Stigmatized people

1. Barabbas
2. Bartimaeus (Mark 10; Luke 18)
3. Blind man #1 (Matthew 9)
4. Blind man #2 (Matthew 9)
5. Blind man #1 (Matthew 20)
6. Blind man #2 (Matthew 20)
7. Blind man (Mark 8)
8. Crucified criminal #1
9. Crucified criminal #2
10. Daughter of Jairus
11. Daughter of the Syro-Phoenician woman
12. Dead man raised (Luke 7)
13. Deaf, mute man (Mark 7)
14. Demon-possessed man #1 (Matthew 8; Mark 5; Luke 8)
15. Demon-possessed man #2 (Matthew 8)
16. Epileptic
17. Greeks
18. Lazarus
19. Leper #1, also a Samaritan (Luke 17)
20. Leper #2 (Luke 17)
21. Leper #3 (Luke 17)
22. Leper #4 (Luke 17)

23. Leper #5 (Luke 17)
24. Leper #6 (Luke 17)
25. Leper #7 (Luke 17)
26. Leper #8 (Luke 17)
27. Leper #9 (Luke 17)
28. Leper #10 (Luke 17)
29. Leper (Matthew 8; Mark 1; Luke 5)
30. Man blind from birth
31. Man mute, blind, and with a demon (Matthew 12; Luke 11)
32. Man with a demon (Mark 1; Luke 4)
33. Man with dropsy
34. Man with infirmity (John 5)
35. Man with a withered hand
36. Mother-in-law of Peter
37. Mute man (Matthew 9)
38. Nobleman's sick son
39. Paralytic (Matthew 9; Mark 2; Luke 5)
40. Poor widow (Mark 12; Luke 21)
41. Samaritans
42. Simon, the leper
43. Sinful woman (Luke 7)
44. Syro-Phoenician woman
45. Tax collectors
46. Tax collectors and sinners
47. Woman caught in adultery (John 8)
48. Woman of Samaria (John 4)
49. Woman with an alabaster flask
50. Woman with an issue of blood
51. Woman with infirmity (Luke 13)
52. Zacchaeus

Category #5—Others

1. Boy with five loaves and two fish
2. Children
3. Cleopas
4. Disciples of John the Baptist
5. Father of the epileptic
6. Nobleman
7. Person with Cleopas (Luke 24)
8. Simon of Cyrene
9. Widow mother (Luke 7)
10. Wife of Jairus

Source: McClure, 2016: 19–22.

Appendix B: The Data Collection

Important information about the data collection is presented in McClure's first study on Jesus's social network (2016: 7–8):

This paper analyzes Jesus's social network, based on the [ties] recorded in the four Gospels of the New Testament: Matthew, Mark, Luke, and John (Powell, 1998: 1).⁹ It is important to note that these Gospels are not biographies of Jesus but rather theological writings to certain Christian communities about Jesus's life and ministry (Powell, 1998: 7–8; White, 2004: 98). Each Gospel conveys a unique emphasis and specific theological points (Powell, 1998: 2). Although these Gospels certainly do not describe all of Jesus's interactions (Powell, 1998: 7), they are the earliest sources about Jesus's life (White, 2004: 98). Additionally, when conducting analyses of the Gospels, it is difficult to differentiate Jesus's actual words, actions, and intentions from the perspectives or interpretative frames of the authors (Hayes and Holladay, 2007: 22–24). This study views the texts of the Gospels as autonomous documents that are shaped by events, ideas, authors, and audiences (Hayes and Holladay, 2007: 23, 182; White, 2004: 116), and it analyzes these texts as they are, without differentiating the historical accounts from the authors' viewpoints.

This study coded [interpersonal connections] between humans in the Gospels, whether or not a name was given.¹⁰ For example, a leper could be referred to as the leper from Matthew 8, since a name is not given for this leper in the text. Individuals (Jesus, Simon Peter, etc.) and concrete groups of people (the Pharisees, Sadducees, disciples of Jesus, etc.) were included as actors. Some groups were treated as actors, while individual members were also treated as distinct actors. The most common instance includes coding the group of Jesus's disciples as a node and then coding each of the individual disciples as nodes. References to larger conglomerates like crowds and multitudes were not coded (e.g., Matthew 14:14; Luke 6:17).

A number of challenges arose when the same actor had multiple names, when multiple actors had the same name, and when accounts were repeated in different Gospels. Actors who had multiple names, like Simon Peter or Nathaniel/Bartholomew, were coded as one actor, based on traditional understandings of the names (Glover, 1939: 44–45). When different actors had the same name (like Mary Magdalene and Mary, the mother of Jesus), more details were used to distinguish between them. Similar accounts across the Gospels, like when Jesus heals the boy with epilepsy and/or a demon (Matthew

⁹ The present study coded data from the New King James Version. The data collection for this project was inspired by Christoph Römheld's social network dataset that contains all of the proper nouns, including people, places, and events, in the King James Bible (2008). Chris Harrison (2008) has produced sophisticated visualizations of Römheld's data.

¹⁰ References to non-human beings, like God the Father, the Holy Spirit, angels, Satan, and demons, were not included.

17:14–18; Mark 9:17–27; Luke 9:38–42), were combined so that there is one epileptic/demon-possessed boy, not three (see Aland, 1985: 341–55). After creating an initial list of 144 actors, I removed actors who did not [have any ties] with Jesus from the final list of actors in order to focus on Jesus's social network.¹¹ In total, 121 actors were included in this analysis.

The matrix that indicates whether there are ties between actors is called an adjacency matrix (Borgatti, Everett, and Johnson, 2013: 18–20). For this study, it records whether or not a pair of actors interacted, and, if they did, whether the tie was positive or negative. Network ties are symmetric, or non-directional. In other words, they indicate, for example, whether Jesus interacted with a Samaritan woman, but not who initiated the interaction or who responded. Whether ties were positive or negative was determined by coding each [interpersonal connection] between each pair of actors as either positive or negative. If there were more positive than negative [connections], the tie was coded as positive; on the other hand, if there were more negative than positive [connections], the tie was coded as negative.¹²

Some attribute data were collected for the actors in Jesus's social network. Based on what was available in the text of the Gospels, the gender of each actor was coded. The actors were also coded into the following categories: Jesus's family and followers; civil and religious authorities; stigmatized people; others who did not fit into these categories. Actors who fit into multiple categories were placed into the category that best fit their role in the narrative. For example, Pontius Pilate, who was a Gentile (i.e., stigmatized) and a civil authority, was coded with the civil and religious authorities, not stigmatized people.

This appendix also includes additional information about the coding process. Jennifer McClure coded the data. The ties were coded based on the texts of the four canonical Gospels in the New Testament. Ties were coded if (1) an actor interacted with another actor; (2) an actor was a member of another group (e.g., Simon, a Pharisee, mentioned in Luke 7:36–50, was tied with the group of Pharisees); (3) an actor responded or acted in response to another actor, even if the actors were not both present in the passage (e.g., Jesus's disciples have a negative tie with the Jewish leaders because of their fear of the Jewish leaders in John 20:19); (4) an actor mentioned another actor, even if they were not both present in the passage (e.g., Jesus is tied to Herod in the situation where he calls Herod a “fox” in Luke 13:32). The data collection for this project began in the fall

¹¹ The 23 excluded actors are: Alexander and Rufus (Mark 15); another girl (Matthew 26); another man (Luke 22); Archelaus (Matthew 2); Chuza (Luke 8); Elizabeth and Zacharias (Luke 1); Herodias, the daughter of Herodias, and Philip, Herod's brother (Matthew 14); priests and Levites (John 1); Tiberius Caesar and Lysanias (Luke 3); Malchus (John 18); officers (Mark 6); parents of the man blind from birth (John 9); a servant girl (Matthew 26; Mark 14; Luke 22; John 18); a servant of Caiaphas (Matthew 26); Simon, Judas Iscariot's father (John 6, 12, 13); soldiers (Luke 3); Zebedee, the father of James and John (Matthew 4; Mark 1).

¹² There were no ties with equal numbers of positive and negative interactions.

of 2013, and since the initial coding, McClure has inspected the coding of ties at least five times.

The data collection took account of parallel accounts among the Gospels. The many parallel accounts can be found in books like Kurt Aland's *Synopsis of the Four Gospels* (1985). For example, the passage on "Jairus's Daughter and the Woman with a Hemorrhage" is in all three synoptic Gospels—Matthew, Mark, and Luke (Aland, 1985: 125–27). The four unique actors in this passage are Jairus, his wife, his daughter, and the woman with an issue of blood. In coding these parallel passages, each of these actors was included in Jesus's social network once, not three times. The method for coding parallel passages also matters for determining if ties were positive or negative, which is based on the number of positive versus negative interpersonal connections. This study also counted interpersonal connections in such a way that parallel accounts were counted once, not as many times as they appeared across the Gospels. There are some instances, however, where the Gospels depict interpersonal connections differently. Some examples involve Jesus's interactions with his disciples (Powell, 2009: 111, 154). In these situations, these differences did not pose challenges when determining whether to code ties as negative or positive because the negative interactions between Jesus and his disciples were largely outweighed by their positive interactions. Another relevant example involves Jesus and his interactions with the two criminals with whom he was crucified. Matthew and Mark depict both criminals as denouncing Jesus; however, Luke depicts one criminal as criticizing Jesus and the other as asking for salvation (Aland, 1985: 319–20). This study follows Luke's text and depicts Jesus's tie with the first criminal as positive and his tie with the other as negative.

Appendix C: Actors by Subgroup (Clauset-Newman-Moore algorithm)

Subgroup #1

1. Andrew
2. Bartholomew (also known as Nathanael)
3. Boy with five loaves and two fish
4. Greeks
5. James, son of Alphaeus
6. James, son of Zebedee
7. Matthew (also known as Levi)
8. Mother-in-law of Peter
9. Philip
10. Simon Peter
11. Simon, the Canaanite (also known as Simon the zealot)
12. Tax collectors
13. Tax collectors and sinners
14. Thaddeus (also known as Judas, son of James or Judas, not Iscariot)
15. Thomas
16. Zaccheus

Subgroup #2

1. Anna
2. Bartimaeus (Mark 10; Luke 18)
3. Blind man #1 (Matthew 9)
4. Blind man #2 (Matthew 9)
5. Blind man #1 (Matthew 20)
6. Blind man #2 (Matthew 20)
7. Blind man (Mark 8)
8. Centurion (Matthew 8; Luke 7)
9. Crucified criminal #1
10. Crucified criminal #2
11. Daughter of Jairus
12. Daughter of the Syro-Phoenician woman
13. Deaf, mute man (Mark 7)
14. Demon-possessed man #1 (Matthew 8; Mark 5; Luke 8)
15. Demon-possessed man #2 (Matthew 8)
16. Jairus
17. Jesus
18. Leper (Matthew 8; Mark 1; Luke 5)
19. Man mute, blind, and with a demon (Matthew 12; Luke 11)
20. Man with a demon (Mark 1; Luke 4)
21. Man with dropsy
22. Man with a withered hand
23. Mute man (Matthew 9)
24. Nobleman

25. Nobleman's sick son
26. Paralytic (Matthew 9; Mark 2; Luke 5)
27. Poor widow (Mark 12; Luke 21)
28. Rich young ruler
29. Ruler of the synagogue
30. Samaritans
31. Seventy others
32. Simon, a Pharisee
33. Simon of Cyrene
34. Simon, the leper
35. Sinful woman (Luke 7)
36. Soldiers of Pilate
37. Syro-Phoenician woman
38. Wife of Jairus
39. Woman of Samaria (John 4)
40. Woman with an issue of blood
41. Woman with infirmity (Luke 13)

Subgroup #3

1. Joanna
2. John, son of Zebedee (also the disciple whom Jesus loved)
3. Joseph
4. Joseph of Arimathea
5. Mary Magdalene
6. Mary, mother of James and Josés
7. Mary, mother of Jesus
8. Mary, wife of Cleopas
9. Salome (also the mother of James and John, sons of Zebedee)
10. Shepherds
11. Simeon
12. Sister of Mary, the mother of Jesus
13. Susanna
14. Wise men (also known as Magi)

Subgroup #4

1. Leper #1, also a Samaritan (Luke 17)
2. Leper #2 (Luke 17)
3. Leper #3 (Luke 17)
4. Leper #4 (Luke 17)
5. Leper #5 (Luke 17)
6. Leper #6 (Luke 17)
7. Leper #7 (Luke 17)
8. Leper #8 (Luke 17)
9. Leper #9 (Luke 17)
10. Leper #10 (Luke 17)

Subgroup #5

1. Annas
2. Barabbas
3. Caiaphas
4. Captains of the temple
5. Centurion (Mark 15; Luke 23)
6. Chief Priests
7. Disciples of John the Baptist
8. Elders
9. Herod Antipas
10. Herodians
11. Jewish leaders
12. John the Baptist
13. Judas Iscariot
14. Lawyers
15. Lazarus
16. Man blind from birth
17. Man with infirmity (John 5)
18. Martha of Bethany
19. Mary of Bethany
20. Nicodemus
21. Pharisees
22. Pontius Pilate
23. Sadducees
24. Scribes
25. Teachers of the law
26. Wife of Pilate
27. Woman caught in adultery (John 8)

Subgroup #6

1. Children
2. Cleopas
3. Dead man raised (Luke 7)
4. Disciples of Jesus
5. Epileptic
6. Father of the epileptic
7. James, brother of Jesus
8. Joses, brother of Jesus
9. Judas, brother of Jesus
10. Person with Cleopas (Luke 24)
11. Simon, brother of Jesus
12. Widow mother (Luke 7)
13. Woman with an alabaster flask

Appendix D: Actors by Block (CONCOR)

Block #1

1. Jesus

Block #2

1. Andrew
2. Bartholomew (also known as Nathanael)
3. Disciples of Jesus
4. James, son of Alphaeus
5. James, son of Zebedee
6. John, son of Zebedee (also the disciple whom Jesus loved)
7. Matthew (also known as Levi)
8. Philip
9. Simon Peter
10. Simon, the Canaanite (also known as Simon the zealot)
11. Thaddeus (also known as Judas, son of James or Judas, not Iscariot)
12. Thomas

Block #3

1. Joseph
2. Joseph of Arimathea
3. Mary, wife of Cleopas
4. Salome (also the mother of James and John, sons of Zebedee)
5. Shepherds
6. Simeon
7. Sister of Mary, the mother of Jesus
8. Susanna
9. Wise men (also known as Magi)

Block #4

1. Mary Magdalene

Block #5

1. Cleopas
2. Dead man raised (Luke 7)
3. Epileptic
4. Father of the epileptic
5. James, brother of Jesus
6. Joanna
7. Joses, brother of Jesus
8. Judas, brother of Jesus
9. Man blind from birth
10. Mary, mother of James and Joses
11. Mary, mother of Jesus

12. Person with Cleopas (Luke 24)
13. Simon, brother of Jesus
14. Syro-Phoenician woman
15. Tax collectors and sinners
16. Widow mother (Luke 7)
17. Woman of Samaria (John 4)

Block #6

1. Leper #1, also a Samaritan (Luke 17)
2. Leper #2 (Luke 17)
3. Leper #3 (Luke 17)
4. Leper #4 (Luke 17)
5. Leper #5 (Luke 17)
6. Leper #6 (Luke 17)
7. Leper #7 (Luke 17)
8. Leper #8 (Luke 17)
9. Leper #9 (Luke 17)
10. Leper #10 (Luke 17)

Block #7

1. Anna
2. Barabbas
3. Bartimaeus (Mark 10; Luke 18)
4. Blind man #1 (Matthew 9)
5. Blind man #2 (Matthew 9)
6. Blind man #1 (Matthew 20)
7. Blind man #2 (Matthew 20)
8. Blind man (Mark 8)
9. Boy with five loaves and two fish
10. Centurion (Mark 15; Luke 23)
11. Centurion (Matthew 8; Luke 7)
12. Children
13. Crucified criminal #2
14. Daughter of Jairus
15. Daughter of the Syro-Phoenician woman
16. Deaf, mute man (Mark 7)
17. Demon-possessed man #1 (Matthew 8; Mark 5; Luke 8)
18. Demon-possessed man #2 (Matthew 8)
19. Disciples of John the Baptist
20. Greeks
21. Jairus
22. John the Baptist
23. Lazarus
24. Leper (Matthew 8; Mark 1; Luke 5)
25. Man mute, blind, and with a demon (Matthew 12; Luke 11)

26. Man with a demon (Mark 1; Luke 4)
27. Man with dropsy
28. Man with a withered hand
29. Man with infirmity (John 5)
30. Martha of Bethany
31. Mary of Bethany
32. Mother-in-law of Peter
33. Mute man (Matthew 9)
34. Nicodemus
35. Nobleman
36. Nobleman's sick son
37. Paralytic (Matthew 9; Mark 2; Luke 5)
38. Poor widow (Mark 12; Luke 21)
39. Samaritans
40. Seventy others
41. Simon of Cyrene
42. Simon, the leper
43. Sinful woman (Luke 7)
44. Tax collectors
45. Teachers of the law
46. Wife of Jairus
47. Wife of Pilate
48. Woman caught in adultery (John 8)
49. Woman with an alabaster flask
50. Woman with an issue of blood
51. Woman with infirmity (Luke 13)
52. Zaccheus

Block #8

1. Annas
2. Caiaphas
3. Captains of the temple
4. Chief Priests
5. Crucified criminal #1
6. Elders
7. Herod Antipas
8. Herodians
9. Jewish leaders
10. Judas Iscariot
11. Lawyers
12. Pharisees
13. Pontius Pilate
14. Rich young ruler
15. Ruler of the synagogue
16. Sadducees

17. Scribes
18. Simon, a Pharisee
19. Soldiers of Pilate

Appendix E: Block Densities and Reduced Matrices

Positive Ties - Density Matrix

	#1	#2	#3	#4	#5	#6	#7	#8
#1	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
#2	1.000	1.000	0.019	0.250	0.093	0.000	0.013	0.057
#3	1.000	0.019	0.083	0.556	0.059	0.000	0.002	0.012
#4	1.000	0.250	0.556	0.000	0.176	0.000	0.000	0.000
#5	1.000	0.093	0.059	0.176	0.103	0.000	0.003	0.000
#6	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000
#7	1.000	0.013	0.002	0.000	0.003	0.000	0.010	0.010
#8	0.000	0.057	0.012	0.000	0.000	0.000	0.010	0.211

 $\alpha=0.049$; criterion=0.074

Positive Ties - Reduced Matrix

	#1	#2	#3	#4	#5	#6	#7	#8
#1	0	1	1	1	1	1	1	0
#2	1	1	0	1	1	0	0	0
#3	1	0	1	1	0	0	0	0
#4	1	1	1	0	1	0	0	0
#5	1	1	0	1	1	0	0	0
#6	1	0	0	0	0	1	0	0
#7	1	0	0	0	0	0	0	0
#8	0	0	0	0	0	0	0	1

Negative Ties - Density Matrix

	#1	#2	#3	#4	#5	#6	#7	#8
#1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
#2	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.013
#3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
#4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
#5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
#6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
#7	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.014
#8	1.000	0.013	0.006	0.000	0.012	0.000	0.014	0.006

 $\alpha=0.006$; criterion=0.009

Negative Ties - Reduced Matrix

	#1	#2	#3	#4	#5	#6	#7	#8
#1	0	0	0	0	0	0	0	1
#2	0	0	0	0	0	0	0	1
#3	0	0	0	0	0	0	0	0
#4	0	0	0	0	0	0	0	0
#5	0	0	0	0	0	0	0	1
#6	0	0	0	0	0	0	0	0
#7	0	0	0	0	0	0	0	1
#8	1	1	0	0	1	0	1	0