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Connected and Fragmented: Introducing a Social Network Study of Religious Congregations

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Connected and Fragmented: Introducing a Social Network Study of Religious Congregations

Abstract: This article introduces a new data collection on the social networks between religious congregations in eight counties encompassing and surrounding a major metropolitan area in the southeastern United States. Participating congregations were asked to mention up to ten other congregations within the study area with whom they were connected. Of the congregations in the study area, 20% participated, and another 30% were mentioned by a participating congregation as a connection; the larger social network that can be created from this project includes 50% of the congregations in the study area. This article's initial analyses describe and depict the overall structure of the network, focusing on patterns of cohesion, fragmentation, and centralization, which have implications for congregations' ability to access friendship and support within the network. Future research from this project will use social network analytic techniques to examine diversity and homogeneity within relational patterns and to analyze the relationships between congregational connectedness, isolation, vitality, and sustainability. This collection addresses a need for network data within sociology of religion and congregational studies, whose scholars often ask questions related to relational dynamics in religious settings but lack the data needed to analyze them.

INTRODUCTION

This article introduces a new study that investigates relational ties between religious congregations in eight counties encompassing and surrounding a major metropolitan area in the southeastern United States. This study utilizes social network analysis, a "growing academic area … [that] emphasizes the importance of social ties among actors … and networks that emerge out of, and mold social interaction" (Felmlee and Faris, 2013:439). In contrast to traditional statistical methods that focus on attributes of units (e.g., individuals, congregations, or organizations) and that assume "independence" among the units (Fox, 2008:101), social network analysis intentionally measures relational connections among units and seeks to understand the relational patterns in concert with attributes of the units (Borgatti, Everett, and Johnson, 2018:144). Many surveys of congregations thus far have either focused on congregations as the key unit or integrated data on congregations with information about their attenders and ministers (e.g., Chaves 2004; Woolever and Bruce 2010). However, very little research has used social network analysis to examine congregational life, and no other study, to my knowledge, has examined networks of relationships among U.S. congregations or among congregations from multiple faith traditions, including non-Christian ones (see Chapman 2004 for a network analysis of Canadian evangelical congregations).

This study fills a need within sociology of religion and congregational studies, whose scholars often refer to network properties but lack data to investigate them empirically (Cheadle and Schwadel, 2012:1199; Everton, 2018:xvi-xvii). For example, in congregational studies, Nancy Ammerman conducted an extensive study of congregations' partnerships that is not based on social network analysis (2005); in addition, the National Congregations Study measures whether congregations report collaborations with other congregations for social service projects

(Chaves, Anderson, and Eagle 2014). However, these studies cannot gauge network dynamics among congregations.

Sean Everton, a prominent scholar at the intersection of social network analysis and sociology of religion, has identified four ways that network dynamics operate in religious settings (2018). First, religious social networks can "bind" people and communities, and particularly those that are homogeneous, together (Everton, 2018:85; see also Putnam, 2000:22 and McPherson, Smith-Lovin, and Cook 2001). Second, religious social networks can create bridges that provide flexibility for innovation and that facilitate connections with more diverse people and communities (Everton, 2018:135; see also Granovetter 1973 and Putnam, 2000:22). Third, religious social networks can "build up" and strengthen people through offering friendships and support (Everton, 2018:195; see also Ellison and George 1994 and Bradley 1995). Lastly, religious social networks can also "tear down" by contributing to cultural divides and increasing polarization (Everton, 2018:251; see also Burt 2001). Due to the data limitations presented above, prior research has not been able to investigate these dynamics in relation to congregational life. This data collection will facilitate the examination of, for example, (1) the extent to which congregational networks involve homogeneity, acting as echo chambers, or include more diversity, (2) the extent to which congregations are well connected or isolated and the types of congregations that are more connected or isolated, and (3) the extent to which connectedness and isolation impact congregations' vitality and sustainability.

While future articles from this data collection will address many of these dynamics, this first article introduces the data collection and describes the resulting networks. Its descriptions are oriented around three themes: cohesion; fragmentation; centralization. Network connections can be important sources of friendship and support (Fischer 1982; Wellman and Wortley 1990),

and these three themes matter because they impact the extent to which congregations may be able to access these relational benefits. Cohesion and fragmentation are interrelated; they involve, respectively, “the extent to which a network ‘stays together’ versus the extent to which a network breaks apart” (Prell, 2012:166). Because more cohesive social networks are more interconnected (Borgatti et al., 2018:174), congregations in more cohesive networks may have a greater number of opportunities within the wider network in which they can access friendship and support, while congregations in more fragmented networks may have fewer opportunities for doing so. The third relational theme involves centralization, which concerns “the extent to which a network is dominated by a single [actor]” (Borgatti et al., 2018:184). In a more centralized network, there may be one congregation that serves as the prominent source of most of the friendship and support, while in a decentralized network many congregations may contribute to patterns of friendship and support. Exploring cohesion, fragmentation, and centralization provides a helpful lens into patterns of friendship and support among congregations.

DATA AND METHODS

Data Collection and Response Rates

During the fall of 2017, the Center for Congregational Resources at Samford University mailed 1,951 questionnaires to congregations in eight counties encompassing and surrounding a major metropolitan area in the southeastern United States; an additional questionnaire was given to a minister for whose congregation we did not have an address. The list for the mailing was based on a database of congregations purchased from InfoGroup. Before the mailing, I had done my best to delete religious schools, religious nonprofits and businesses, religious judicatory bodies, duplicate congregations, and congregations that had closed or merged with another congregation, and I included fewer than five newly founded congregations that were not in the

database. However, after the mailing, I still discovered some duplicate congregations and non-congregational entries. Accounting for these, we likely mailed questionnaires to 1,892 valid congregations. Of these, we received 171 completed questionnaires (9.0%) in the mail. This excludes two questionnaires completed by judicatory leaders who filled out the questionnaires for their judicatory body, not a congregation.

While the first wave of data collection focused on the whole population of congregations, a second wave used snowballing, which involved inviting alters, or the congregations to whom the participating congregations mentioned having connections (Wasserman and Faust, 1994:42), to take part in the study (Borgatti et al., 2018:40). Snowballing did not provide all congregations in the study area with an equal chance to participate; however, it is commonly used "to avoid the sparsity of connections" that sometimes occurs in network studies that include many actors (Scott, 2013:50). The second wave of data collection occurred through phone interviews, for which each additional congregation became eligible by being mentioned as an alter. Each alter received three contacts; if, before the third contact, they indicated that they were not interested in participating in the study, however, they no longer received contacts. Contacts included: phone calls, emails, contacts through online forms, giving questionnaires directly to ministers, and giving questionnaires to judicatory leaders to distribute (for the two who originally filled out questionnaires for their judicatory bodies). The phone call was the preferred method of contact, and other forms were typically used when the congregation could not be reached by phone. Interviews took place from January 17, 2018 to December 13, 2018. Congregations became eligible all throughout the period of phone interviews. Many congregations that became eligible early in the study received their three calls spaced out over six or more months; others who became eligible for the study near the end of the data collection received their three calls within a

few weeks or a month; a few became eligible in the last week of the data collection and received their three calls within 3-5 days.

Of the 906 congregations mentioned as alters that did not originally respond to the mailed questionnaire (some of whom did not receive it because I was not aware of them), 267 (29.5%) completed phone interviews. Throughout the process, I learned of congregations that merged, changed their names, changed their location and/or phone number, and closed, and I accounted for these things in recruiting congregations. I also learned of 294 congregations that were not originally mailed or given a survey, and I invited them to participate in the study as well.[1]

The questionnaires and subsequent phone interviews were typically completed by a minister or staff member at the congregation. In a few cases where there was not a minister or staff member due to a leadership transition or financial challenges, a long-time lay leader provided the information. The same questions were asked via the paper questionnaire and the phone interview. Completing the paper questionnaire typically took 10-15 minutes, and the phone interview typically lasted 30-40 minutes.

In summary, of the 2,186 congregations (that I am aware of) in the eight-county study area, 438 (20.0%) participated in the study, and 639 (29.2%) were mentioned as a connection but did not participate. Overall, 1,077 (49.3%) were connected in some way to the study (participants or alters). Table 1 presents a numerical summary of the data collection and response rates.

[1] Five congregations that were eligible to participate in the study were not invited to. However, the error was noticed after the data collection was completed.

Table 1. Numerical Summary of Data Collection and Response Rates

Congregations	
In InfoGroup database	1,892
Not in InfoGroup database	294
Total	2,186
First Wave of Data Collection	
Valid congregations receiving questionnaires	1,892
Questionnaires returned	171
Response rate	9.0%
Second Wave of Data Collection	
Congregations receiving phone calls	906
Phone interviews completed	267
Response Rate	29.5%
Overall Summary	
Total congregations	2,186
Participating congregations	438
Alters that did not participate	639
Congregations connected to study (participants and alters)	1,077
Overall response rate for participants	20.0%
Percentage of congregations connected to study (participants and alters)	49.3%

The data collection has a variety of biases. First, there was a bias against congregations with no relational ties, since all congregations contacted in the second wave of data collection had been reported as an alter and had at least one tie. Second, because the second wave of the data collection relied on phone calls, leaving voicemails, and sending messages via email and website contact forms, there was bias against congregations without a working phone number, without a working voicemail, and without an online way to contact the congregation.

Assessing the Participating Congregations

The initial list of congregations in the eight-county study area was based on a database of congregations purchased from InfoGroup. Its promotional materials state:

> Infogroup provides the most complete and accurate database of churches and religious associated businesses with approximately 350,000 houses of worship [in the United States]. The Infogroup database is compiled from yellow page directories, telephone verification, denominational directories, white pages, utility sources, and church websites. Church related information found in the church sections of the yellow pages is compiled as the phone books go through the standard Infogroup update process and basic information is collected. The Infogroup compilation associates utilize denominational directories and web research to enhance the data with unique information including religious denomination, church size, church attendance, membership race, church school size, and various church ministries. In addition, new churches and religious organizations are identified through utility connects and other public sources. ("InfoGroup Documentation")

While no list of congregations is complete or perfect, InfoGroup was chosen due to its robust list of congregations across multiple faith traditions. However, it is difficult to use its information about congregational characteristics to determine the representativeness of the participating congregations due to some incomplete and inaccurate information about denominational affiliations and other characteristics.

Although comparing participating and non-participating congregations is not possible, comparisons between participants can still be beneficial for assessing the quality of the data collection. The first comparison only involves congregations that were originally mailed a

survey, and it explores differences between the congregations that returned the survey via mail (referred to as "initial") and the congregations that completed phone interviews (referred to as "later"). This comparison seeks to differentiate, among congregations that had a chance to respond to the population-wide survey via mail, the initial congregations from the later congregations that were selected via snowball sampling, which was not random. The following differences were identified via bivariate analyses.[2] The initial congregations, on average, had an earlier founding date than the later congregations; a greater percentage of the initial congregations were founded before 1900, while a greater percentage of the later congregations were founded in 2000 or later. The initial congregations tended to have fewer in average weekly attendance than the later congregation, with the former having a greater percentage of congregations with an average weekly attendance of less than 100. The initial congregations, compared to the later, had a greater percentage of regularly attending adults that were 60 or older. The initial congregations had an older main minister[3] than the later congregations; a greater percentage of the initial congregations had a main minister who was 65 or older, while a greater percentage of the later congregations had a main minister who was 40-54. Lastly, the initial congregations were more likely to have a main minister whose tenure at the congregation was either less than five years or at least 20 years, while the later congregations were more likely to have a main minister with a tenure of 5-19 years. Congregations that returned questionnaires via mail tended to have a longer history, a smaller size, a greater percentage of regularly attending adults that were 60 or older, an older main minister, and a main minister with either a short or rather long tenure.

[2] Bivariate analyses relied on Chi-square tests and t-tests. The results reported are statistically significant at $p<0.05$. Analyses are not presented but are available upon request.
[3] The main minister is defined in the questionnaire as the "solo or leading minister, pastor, priest, rabbi, imam, or other type of congregational leader."

In addition, there are meaningful differences between participating congregations that were included in the original mailing (referred to as "included") and participating congregations that were identified after the mailing (referred to as "excluded"), and these differences have insights for evaluating the representativeness of the InfoGroup database. Of the participating congregations, about 20% (87 out of 438) were excluded from the initial wave of data collection. Compared to included participants, excluded participants are more likely to have the following characteristics[4]: no denominational affiliation; a founding date of 2000 or later; an average weekly attendance of less than 50; a lower percentage of regularly attending adults that are 60 or older; a greater percentage of regularly attending adults that are new to the congregation in the last five years; a main minister who is younger than 40; a main minister whose tenure at the congregation is less than five years; a main minister with either no or certificate-level theological education; either no budget or an annual budget of less than $50,000; a rural location. These analyses suggest that the purchased InfoGroup database was less representative of, for example, nondenominational congregations, recently founded congregations, congregations with younger ministers who have shorter tenures, congregations with fewer resources, and rural congregations.

Contextualizing the Participating Congregations

In order to introduce and contextualize the participating congregations, Table 2 presents comparisons with the 2012 National Congregations Study (NCS) (Chaves et al. 2014) and the 2010 U.S. Religion Census (USRC) (Grammich et al. 2012) in order to see how the participating congregations align with and differ from a nationally representative survey of congregations and an in-depth enumeration of congregations in the study's eight-county area, respectively. For religious tradition, the participating congregations, compared to the 2012 NCS, have a higher

[4] Bivariate analyses relied on Chi-square tests and t-tests. The results reported are statistically significant at $p<0.05$. Analyses are not presented but are available upon request.

percentage of Evangelical Protestant congregations and lower percentages of Black Protestant congregations and congregations from "other" traditions.[5] The greater percentage of Evangelical Protestant congregations in this study is not surprising due to its southeastern context. Compared to the USRC data for the eight counties in the study, however, the participating congregations have a lower percentage of Evangelical Protestant congregations and higher percentages of congregations from the Mainline Protestant, Black Protestant, Roman Catholic, and other traditions.

Table 2. Comparing Current Study to the 2012 National Congregations Study and the 2010 U.S.

	Current Study	2012 NCS	2010 USRC*
Religious Tradition			
Evangelical Protestant	54.1%	46.2%	69.0%
Mainline Protestant	19.4%	20.3%	13.2%
Black Protestant	17.4%	21.4%	13.4%
Roman Catholic	4.3%	5.5%	1.6%
Other traditions	4.8%	6.7%	2.9%
Denominational Affiliation			
Yes	81.2%	76.5%	
No	18.8%	23.5%	
Congregation Size†			
Under 50	21.2%	35.7%	
50-99	23.3%	25.2%	
100-199	22.6%	21.4%	
200-349	14.2%	8.8%	
350-499	7.1%	2.6%	
500-999	5.9%	3.4%	
1,000-1,999	3.4%	1.7%	
2,000+	2.3%	1.2%	
Founding Date			
Before 1900	26.0%	23.8%	
1900-1949	21.8%	23.5%	
1950-1979	19.1%	16.4%	
1980-1999	11.7%	21.6%	
2000 or later	21.4%	14.7%	

*Encompassing this study's eight-county area
†Congregation size measured as average weekly attendance in the current study and as number of regular participants in the 2012 NCS.

	Current Study	2012 NCS
Adults 60 or Older		
0-10%	12.8%	20.7%
11-20%	14.5%	15.2%
21-40%	34.2%	27.1%
41-60%	26.6%	20.4%
61-100%	11.9%	16.5%
Adults Younger than 35		
0-10%	19.8%	26.1%
11-20%	20.2%	28.6%
21-40%	43.5%	30.6%
41-60%	12.0%	10.5%
61-100%	4.6%	4.1%
Main Minister's Sex		
Male	92.0%	88.6%
Female	8.0%	11.4%
Main Minister's Age		
Under 40	14.0%	9.1%
40-54	35.0%	37.0%
55-64	33.6%	32.3%
65+	17.4%	21.7%

Other Notes
N of current study = 438
N of 2012 NCS = 1,331
Some variables have lower Ns due to missing data
2012 NCS data weighted by WTA3CNGD

	Current Study	2012 NCS
Formal Annual Budget		
Yes	83.2%	76.4%
No	16.8%	23.6%
If Yes, Budget Size		
Under $50,000	11.4%	20.4%
$50,000-$150,000	23.1%	36.1%
$150,001-$300,000	21.7%	20.4%
$300,001-$500,000	14.0%	11.5%
$500,001-$1,000,000	12.0%	6.4%
More than $1,000,000	18.0%	5.2%
Community Type‡		
City	29.0%	
Suburb	39.0%	
Town	8.0%	
Rural	24.0%	
Primarily Urban		50.2%
Primarily Suburban		18.1%
Primarily Rural		31.7%

‡Community type for current study determined using 2017 National Center for Education Statistics locale data (Geverdt 2015) in GIS. Community type for NCS based on 2010 U.S. Census designation for census tract.

[5] Religious tradition was coded according to the RELTRAD scheme (Steensland et al. 2000). For the participating congregations, Black Protestant congregations include those from historically African American denominations, like the National Baptist Convention and the African Methodist Episcopal Church, as well as other Methodist, Baptist, and nondenominational congregations where at least 80% of attenders are African American (Steensland et al. 2000:314). Other traditions include: Eastern Orthodox; Jewish; Latter-day Saint; Muslim; Spiritualist; Unitarian Universalist.

The remaining comparisons only involve the 2012 NCS. Greater percentages of the current study's participants have the following characteristics: a denominational affiliation; a congregation size of 200 or more; a founding date of 2000 or later; an age composition where 21-60% of regularly attending adults are 60 or older; an age composition where 21-40% of regularly attending adults are younger than 35; a male main minister; a main minister who is younger than 40; a formal annual budget; a budget of $500,000 or more; a suburban location. In addition, lower percentages of the current study's participants have the following characteristics: a congregation size of less than 50; a founding date between 1980 and 1999; an age composition where either 0-10% or 61-100% of the regularly attending adults are 60 or older; an age composition where 0-20% of the regularly attending adults are younger than 35; a main minister who is 65 or older; a budget of $150,000 or less; a rural or urban location.

Measuring Relational Connections

Relational connections between congregations were measured through the following statement: "Please list up to ten congregations with whom your congregation has close connections, and indicate all of the type(s) of connections for each tie. Please do not list denominational bodies, ministerial associations, or clergy peer groups. Rather, list the congregations with which you have connections through these groups. Please list congregations from only the following counties: [a list of the eight counties in the study area]." The congregations reported through this question are termed alters (Wasserman and Faust, 1994:42). Participating congregations were asked, if the alter had a common name (e.g., First Baptist Church), to provide additional information (street name, etc.) so that I could identify it. Some participants who completed paper questionnaires and who mentioned alters whose identity was

unclear were contacted afterwards via phone to clarify. During phone interviews, the identity of alters was clarified as the relational data were collected.

For each alter mentioned, the participating congregation was asked to report whether their connection with the alter involved: a joint religious service; a joint service project; a joint retreat or conference, friendship with the minister(s), a clergy peer group, a ministerial association, or a pulpit exchange. Because of considerable ambiguity in the ways congregations defined different events, as well as clergy peer groups and ministerial associations, the options were combined into four final types of relational connections: (1) joint events between congregations; (2) friendships with ministers from other congregations; (3) participation in ministerial groups with ministers from other congregations; (4) ministers exchanging pulpits with ministers from other congregations (i.e., speaking at another congregation and/or inviting a minister to speak at theirs).

This information has been used to create 1,077 by 1,077 matrices in which the presence of a relational tie between a pair of congregations is coded as a one and in which the absence of a tie between a pair of congregations is coded as a zero. This article considers: ties to be present among a pair of actors if one or both of the congregations mentioned the tie; ties to be absent if neither congregation mentioned the tie. The five matrices described in this article include: (1) a network involving any type of tie; (2) a network involving only friendships between ministers; (3) a network involving only joint events; (4) a network involving only co-participation in a ministerial group; (5) a network involving only pulpit exchanges.

There are two additional biases related to the measurement of relational ties. First, congregations with more than ten relational ties were limited to reporting ten. Second, congregations were restricted to mentioning alters within the eight-county study area. Some

congregations, however, attempted to report alters outside of the study area. While the geographic boundary was necessary to define the study population, it is important to note that many of the participants have meaningful connections with congregations outside the study area.

Methods

The analyses use a variety of "whole network" measures that describe each entire network, rather than a particular congregation or subset of congregations, and present depictions of each network. Network measures utilized in this article concern cohesion, fragmentation, and centralization. Density is a cohesion measure that gauges "the proportion of the possible [relational ties] that are actually present in the [network]" (Wasserman and Faust, 1994:101), and higher density indicates more cohesion. Another measure of cohesion is based on quantifying network paths, or a sequence of actors and relational ties in which no actor or relational tie is repeated and where each relational tie is counted to measure the distance of the path (Wasserman and Faust, 1994:105-107). "The shortest path between [a pair of actors]" is called a geodesic (Wasserman and Faust, 1994:110), and the results present the average geodesic for the largest component (Wasserman and Faust, 1994:111), with smaller numbers indicating greater cohesion. A fragmentation measure gauges the proportion "of pairs of nodes that cannot reach each other by any" sequence of other actors and relational ties (Borgatti et al., 2018:178). Cohesion and fragmentation can also be gauged through examining the components, which are subsets of networks that are disconnected from other subsets, with no relational ties between the components (Wasserman and Faust, 1994:109). The analyses present: (1) the number of actors in the largest component, a measure of cohesion; (2) the number of isolates, or "actor[s] not having any ties to anyone else" (Prell, 2012:153), a measure of fragmentation. Lastly, the centralization measure ranges from zero to one and involves "the extent to which a network is dominated by a

single [actor]” where networks with high levels of centralization have fewer relational ties that do not involve this key actor (Borgatti et al., 2018:184). These measures were calculated with UCINET 6.695.

Depictions of the social networks are also presented alongside these measures. Each network figure includes the 1,077 congregations and the relational ties present in that particular network. For the nodes representing the congregations, the shapes differ depending on whether the congregation participated in the study, and node size is based on degree centrality, or the number of alters per congregation (Borgatti et al., 2018:191). In order for the networks to depict relational patterns in a decipherable manner, the network layout is organized around clusters identified through the Clauset-Newman-Moore algorithm, which seeks to identify clusters with many internal relational ties and to limit relational ties between clusters (Clauset, Newman, and Moore, 2004:1). The network diagrams have been created using the social network analysis software NodeXL.

RESULTS

The results explore dynamics within five configurations of this study’s social network, where the first involves any of the four types of relational ties and the remaining four involve a specific type of tie—friendships between ministers, joint events, ministerial groups, and pulpit exchanges. Table 3 presents the whole network measures for these networks.

Table 3. Whole Network Measures

	All Ties	Ties Involving Friend-ships between Ministers	Ties Involving Joint Events	Ties Involving Ministerial Groups	Ties Involving Pulpit Exchanges
Density out of 1,000 possible ties	3.337	2.953	2.535	1.961	1.436
Average geodesic in largest comp.	6.537	6.585	7.136	7.870	8.019
Fragmentation	0.057	0.265	0.397	0.652	0.786
Number of congregations in the largest component	1,046	923	836	635	497
Number of isolates	16	89	148	316	388
Centralization	0.013	0.014	0.010	0.012	0.012

Note: Results come from symmetric, dichotomous 1,077 x 1,077 matrices.

The results start with the network that contains all relational ties, which is depicted in Figure 1. The density of the network is fairly sparse with 3.34 ties per 1,000 possible ties; low densities are not uncommon in large networks due to the greater number of possible ties in large networks (Prell, 2012:170; Borgatti et al., 2018:175). The average geodesic is 6.5, indicating the number of network ties, on average, between congregations in the largest component. The level of fragmentation is low; only 5.7% of pairs of actors are disconnected in the network. Almost all congregations (97.1%) are in the largest component, and there are only sixteen congregations (1.5%) that are isolates, without connections to other congregations. There is also a very low level of centralization, indicating that the network is decentralized and not organized around a few highly central nodes. Because this network is inclusive of all four types of relational ties, it is the most cohesive and least fragmented of the networks presented in this article. However, it is cohesive primarily in the sense that almost all of the actors are in the same component; the network is otherwise quite sparse and decentralized.

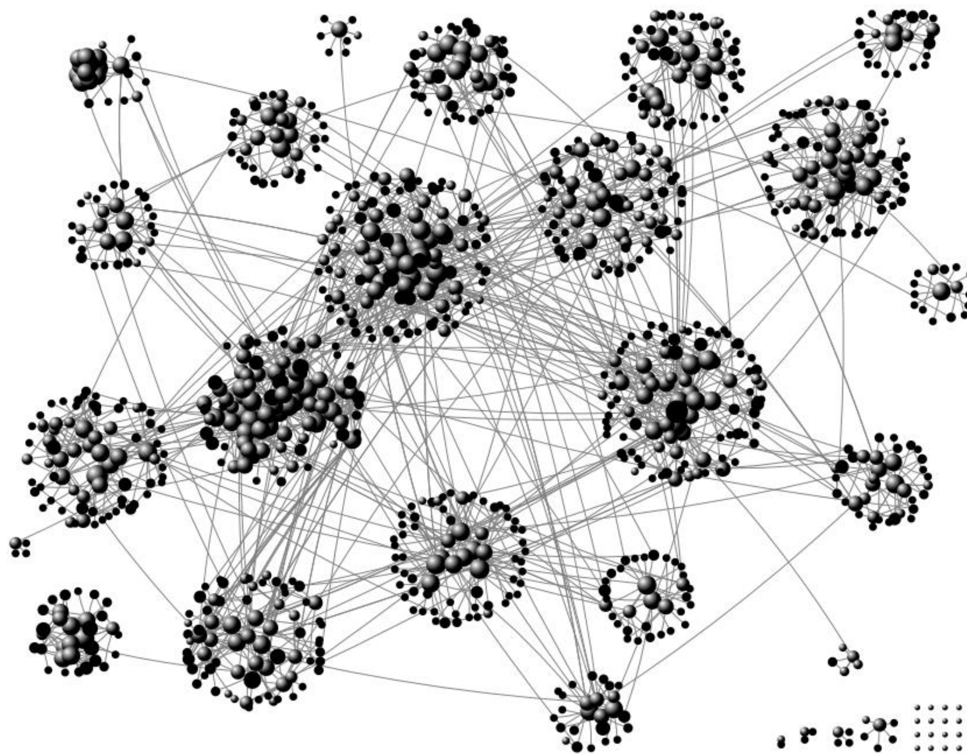


Figure 1. Social Network of All Ties among Congregations

Legend for All Figures

Black spheres = survey participants
Black circles = alters that did not participate
Node size is based on number of connections

Clusters generated with Clauset-Newman-Moore Algorithm (Clauset et al. 2004)

There are differing levels of cohesion across the networks based on specific tie types, which are depicted in Figures 2-5. Higher density values indicate more cohesion, and the densities in these networks are: 2.95 ties per 1,000 possible ties for friendships among ministers; 2.54 ties per 1,000 possible ties for joint events; 1.96 ties per 1,000 possible ties for ministerial groups; 1.44 ties per 1,000 possible ties for pulpit exchanges. The average geodesic within the largest component, which indicates the average number of network ties between congregations, also varies across the networks, and lower average geodesics indicate more cohesion: 6.6 network ties for friendships between ministers; 7.1 network ties for joint events; 7.9 network ties for ministerial groups; 8.0 network ties for pulpit exchanges. Lastly, cohesion can be measured through the number of congregations in the largest component: 923 (85.7%) for friendships between ministers; 836 (77.6%) for joint events; 635 (59.0%) for ministerial groups; 497 (46.1%) for pulpit exchanges. The results indicate that the networks, from most cohesive to least cohesive, are: friendships among ministers; joint events; ministerial groups; pulpit exchanges.

Figure 2. Social Network of Ties Involving Friendships between Ministers

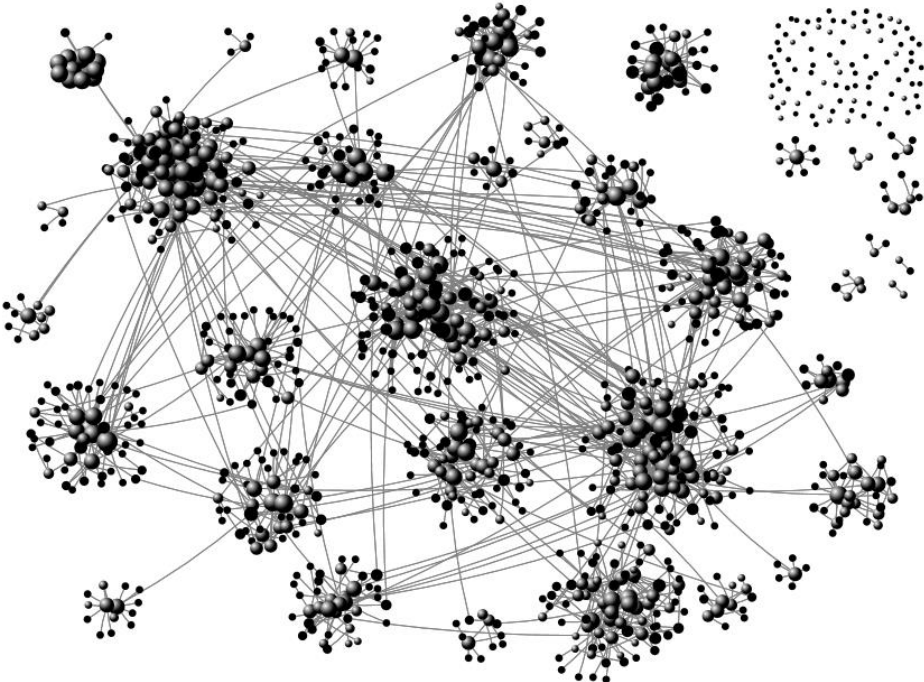


Figure 3. Social Network of Ties Involving Joint Events

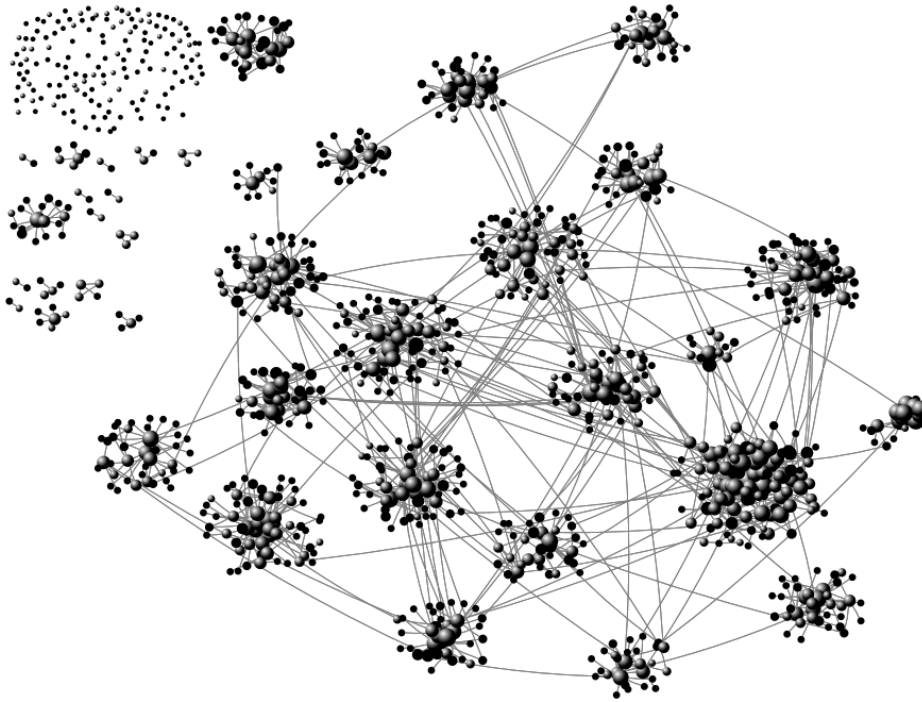


Figure 4. Social Network of Ties Involving Ministerial Groups

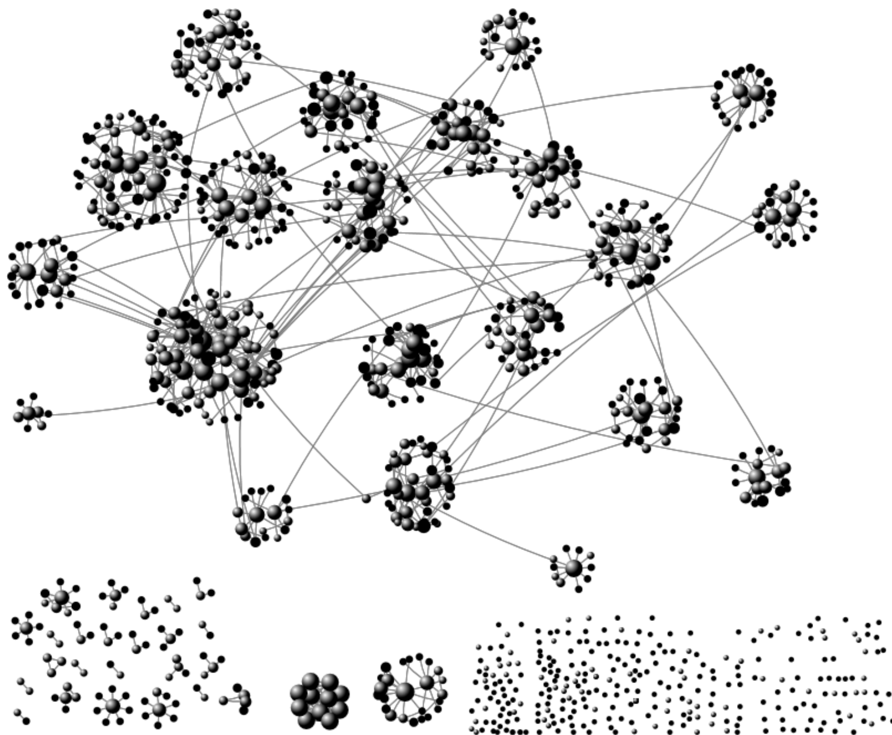
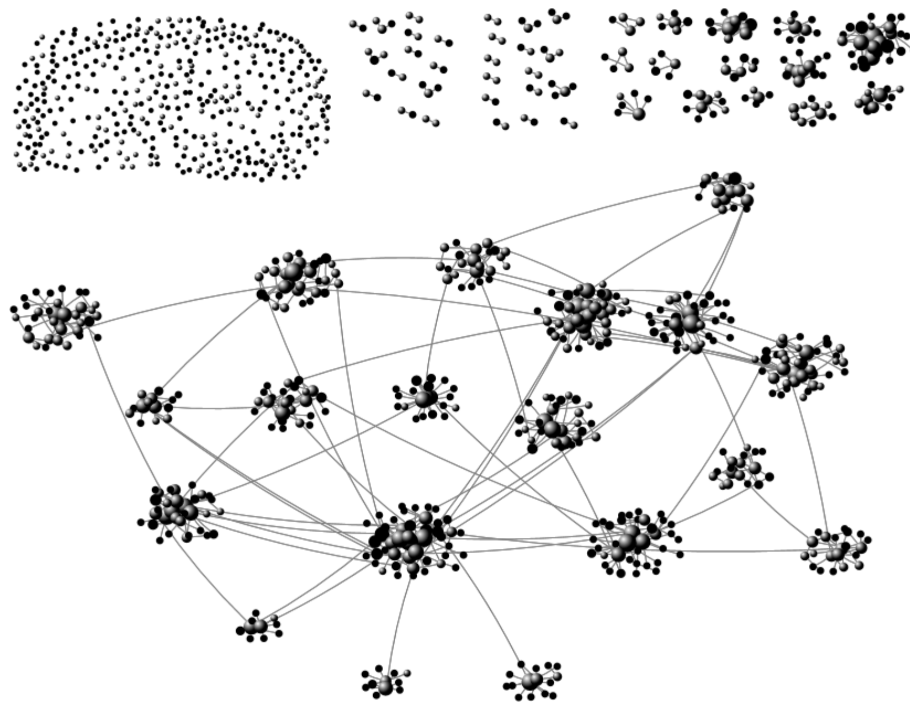


Figure 5. Social Network of Ties Involving Pulpit Exchanges



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

There are also differing levels of fragmentation across these networks. The fragmentation measure, which indicates the proportion of the pairs of actors that are disconnected in the network, varies across the networks: 26.5% of the pairs of actors are disconnected for friendships between ministers; 39.7% of the pairs of actors are disconnected for joint events; 65.2% of the pairs of actors are disconnected for ministerial groups; 78.6% of the pairs of actors are disconnected for pulpit exchanges. The number of congregations that are isolates, or that do not have any relational ties, also differs across these networks: 89 (8.3%) for friendships between ministers; 148 (13.7%) for joint events; 316 (29.3%) for ministerial groups; 388 (36.0%) for pulpit exchanges. These results suggest that the networks, from most fragmented to least fragmented, are: pulpit exchanges; ministerial groups; joint events; friendships among ministers.

Overall, the networks are quite decentralized, indicating that they are not dominated by a single highly-connected congregation. The levels of centralization do not differ meaningfully across the four networks based on specific tie types.

DISCUSSION AND CONCLUSION

This article has introduced a recent data collection that provides a unique look at relational patterns and social networks among religious congregations. The results describe patterns of cohesion, fragmentation, and decentralization across this study's networks. The overall network is cohesive yet sparse with very little fragmentation or centralization. However, levels of cohesion and fragmentation vary across specific types of relational ties. This section discusses the implications of these results, starting with (1) friendships between ministers and (2) ministerial groups, both of which have ramifications for ministers' health, and then moving to (3) joint events and (4) pulpit exchanges, about which there is less research. This section concludes with directions for future research and the limitations of the study.

Many ministers face challenges with stress, mental health, physical health, and burnout (Woolever and Bruce 2012; Proeschold-Bell and Byassee 2018), and friendships with other ministers are crucial for supporting ministers' wellbeing and effectiveness in ministry. A pastor describes the importance of such a relationship: "My biggest thing is having someone to be accountable to…. I have a best friend…. We're both pastors, so we know the day-to-day stresses, and strains, and everything. We're able to relate [and] hold each other accountable" (Proeschold-Bell and Byassee, 2018:128). I am encouraged that, of the four networks focused on specific types of ties presented in this article, the network involving friendships between ministers has the most cohesion, even if it is sparse, and the least fragmentation. However, that there are some congregations in this study whose minister or ministers lack friendships with ministers from

other congregations is concerning. Isolation is quite dangerous for clergy because it can negatively impact their satisfaction in ministry, health, and commitment to ministry (Carroll, 2006:212-213). Jackson Carroll underscores the importance of friendships between ministers both for ministers and their congregations:

> In many conversations with pastors and denominational leaders…, the issue of clergy friendships emerged as of considerable importance for sustaining ministry in challenging times. Having close friends is in itself not a guarantee of excellent pastoral leadership; however, without the support, companionship, mutual critique, and joy that friends offer, without those with whom one can be vulnerable and share deeply, it is difficult, if not impossible, to sustain … [an] excellent ministry. (Carroll, 2006:212)

In this study, the results suggest that most congregations have ministers who are seeking and hopefully finding support, encouragement, and accountability through relationships with other ministers.

Similarly, in light of the demands and challenges that many ministers face, participating in ministerial groups, where ministers regularly gather to learn together and support each other, can be an important way for ministers "to practice self-care" (Woolever and Bruce, 2012:56-57). There are two key types of ministerial groups: (1) clergy peer groups, where small groups of ministers come together and commit to learn with, support, and provide accountability for each other (Marler et al., 2013:5; see also Ammerman, 2005:109); (2) ministerial associations, where larger groups of local ministers can network, organize initiatives, support each other, and find help (Ammerman, 2005:111-112). These groups can provide a venue for an "exchange of ideas and encouragement" (Ammerman, 2005:100) that has benefits for both ministers and their congregations; for example, ministers in ministerial groups engage in better self-care, and their

congregations have a stronger orientation toward community service (Marler et al., 2013:7). In this study, compared to the network involving friendships between ministers, the network involving ministerial groups is much less cohesive and much more fragmented. About 30% of congregations are not connected to any such group within the study area. These benefits are not as accessible for congregations within the network due to its fragmentation.

Joint events and pulpit exchanges are also important forms of connection between congregations. In the NCS, over 60% of congregations reported having a joint worship service in the past year (Chaves and Anderson, 2008:434), and congregations across multiple studies have reported collaborating with many types of organizations, including other congregations, to provide social services (Cnaan et al., 2002:70-71; Chaves, 2004:69). Collaborations on a variety of events, including but not limited to worship services, community service projects, mission trips, children's and youth programming, retreats, conferences, and other events, are beneficial for congregations because collaborating can pool resources, staff, volunteers, and facilities, allowing congregations to minister in ways that may not have been possible alone (e.g., Cnaan et al., 2002:70-75). The network involving joint events in this study is somewhat more cohesive and less fragmented, indicating that many congregations are using joint events with other congregations to increase their capacity for ministry. In addition, many congregations have pulpit exchanges, where a minister from a different congregation speaks or preaches during the service, at least occasionally (Chaves, 2004:232). These exchanges, which are particularly common among African American congregations (Ammerman, 2005:99), allow ministers to speak to a wider range of people and provide attenders opportunities to hear different perspectives and ideas. Unfortunately, however, the social network for pulpit exchanges in this study is very

fragmented, and the numerous congregations not engaged in pulpit exchanges may not experience these benefits.

Additional research will investigate the dynamics in this network, with two themes for orienting future research. First, future research will consider the extent to which congregations' relational patterns reflect homophily and diversity. Homophily, or "the principle that … contact between similar people occurs at a higher rate than among dissimilar people" (McPherson et al., 2001:416), is common in social networks, and religious social networks differ in the extent to which they engage with diverse people and ideas or "they serve as echo chambers" that "reinforce … [shared] beliefs" and values (Putnam and Campbell, 2010:437; see also Putnam, 2000:77-78). As the most common American religious organizational form (Chaves, 2004:3), congregations can facilitate or inhibit attenders' exposure to diversity (Waters, 2018:416). Data from this project will provide opportunities to explore: (1) the extent to which congregations interact with other congregations that are similar to or different from them, in regard to denomination, geographic proximity, community type, average weekly attendance, founding date, racial composition, age composition, and other factors; (2) the types of congregations that have more diverse or more homophilous connections. In addition, future research will identify strongly interconnected clusters of congregations, like those depicted in the figures using the Clauset-Newman-Moore algorithm (Clauset et al. 2004), and gauge the diversity and homogeneity within these subgroups.

Second, future research will consider the relationships between network dynamics and congregational vitality and sustainability. Within sociology of religion and congregational studies, there has been a growing focus on congregational vitality; this trend in research coincides with a shift in defining vitality not only based on congregations' numerical growth,

attendance, and budget size but also based on congregations' faith formation, internal relational dynamics, organizational culture, and broader community engagement (Woolever and Bruce 2004; Bobbitt 2014; Sterland et al. 2018; Theissen et al. 2019). There is ample evidence that religious congregations are important sources of relational connections and social support and that these factors are beneficial for attenders' wellbeing (Ellison and George 1994; Bradley 1995; Krause et al. 2001; Krause and Wulff 2005). However, because of the lack of network data available in sociology of religion and particularly in congregational studies, scholars have not yet examined the extent to which the connectedness and isolation experienced by congregations relate with their relational, spiritual, and organizational health. Future research will investigate not only the factors that predict the extent to which congregations are well connected or isolated within the network but also the relationships between congregations' connectedness, isolation, vitality, and sustainability.

There are a variety of limitations for this project that are common across studies of social networks. Defining the eight-county population and boundary for this study resulted in the participants not being generalizable to U.S. congregations and not being able to mention congregational connections outside of the study area (Prell, 2012:65-66). The use of snowball sampling, which ensured interconnectedness among the participants, did not provide congregations with equal opportunities to participate (Prell, 2012:67), and it resulted in fewer isolates among participants. Using mailed questionnaires and phone interviews to collect data limited the opportunities of congregations without a working phone or without publicly available contact information to participate. In addition, network questions can increase respondent burden; due to this factor, participants were asked to mention at most ten other congregations to "minimize … anger and frustration," as well as the length of time required to complete the

questionnaire or interview (Borgatti et al., 2018:60-61). This decision limited the responses of congregations that had more than ten connections. However, some participants may not have answered the network question fully or at all due to time constraints. Missing data on both congregations and the connections between them can impact data quality and accuracy (Borgatti et al., 2018:42-43). These limitations reflect common challenges across network studies. A final limitation is that, due to the geographical context of the southeastern United States, the network is heavily oriented toward Evangelical Protestant and Baptist congregations, which are not as predominant in other parts of the country.

In conclusion, the social network captured in this study provides a window into relational patterns among congregations, which are important to sociologists of religion and congregational scholars but often not directly observable due to data limitations (Cheadle and Schwadel, 2012:1199; Everton, 2018:xvi-xvii). This data collection will facilitate exploring patterns of diversity and homogeneity in a network of congregations, as well as investigating the relationships between congregations' connectedness, isolation, vitality, and sustainability.

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