2. *The Structure of the International Communication Association—2016: A Network Analysis*

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Communication, as a field and discipline, is constituted of diverse subject matter and theoretical perspectives. As Craig (1999) has argued, communication is not a coherent field, but rather an interdisciplinary clearinghouse of "disciplinary traditions, substantive specialties, methodologies, and school of thought" (p. 120). Scholars have engaged in empirical research and discussion about its structure, antecedent conditions that created its current form, and how the idealized field should look (Rogers & Chaffee, 1983). Much of this research has used network analysis methods to describe the discipline (Barnett, 2013). Specifically, the structure of the communication discipline, and the patterns of communication among the disciplines' scholars, can be described through the social and semantic network analysis of the affiliations of communication scholars, hiring practices (Barnett, Danowski, Feeley, & Salker, 2010; Mai, Liu, & González-Bailón, 2015) and academic publication (journals, books, conference papers) (Barnett, Huh, Kim, & Park, 2011).

This chapter describes the structure of the International Communication Association (ICA) based on its member affiliations in the various divisions and interest groups that comprise the organization and through a semantic network analysis of the paper titles presented at the organization's annual conferences from 2013 to 2016. It extends previous social network analysis by adding the examinations of co-authorships among scholars from different countries and regions, and relationships between divisions/interest groups and the authors' countries of origin. Also, it broadens the previous semantic network analysis of the concepts in ICA conference paper titles by how they have been used by scholars from different countries. Specifically, it conducts a

social and semantic network analysis to study the structure of communication research on a global level by examining the evolution of the structures of joint membership networks of ICA divisions and interest groups between 1991, 2005, and 2016, as well as by exploring the relations among the ICA's divisions and interest groups, the scholars' countries of origin, and the concepts used in the titles of conference papers between 2013 and 2016.

Past Research

In 1991, Barnett and Danowski (1992) examined communication scholars' affiliations through joint memberships in the ICA's divisions and interest groups. They reported that communication research could be best described along three dimensions: science to humanities, mediated to interpersonal communication, and theoretical to applied. Also, they found clusters of the humanities, media, interpersonal, and technology. At the organization's center was Mass Communication. At the periphery were various interest groups and the Instructional Division.

Later, Doerfel and Barnett (1999) used semantic network analysis methods to study the structure of the ICA by examining the titles of papers presented to its divisions and interest groups at its 1991 conference. Semantic network analysis examines the relationships in a body of text based on the shared meanings of symbols. In other words, two entities are connected to the extent that the use of concepts (words) overlaps. The results revealed that the semantic network for ICA had a high degree of correspondence with the affiliation structure reported by Barnett and Danowski (1992).

In the mid-2000s, Lee and Barnett (2006) extended prior research through a network analysis based on joint memberships in the ICA's divisions/interest groups in 2005, and a semantic network analysis based on the shared words in paper titles presented to its divisions and interest groups at its 2005 conference. They compared the structure of ICA in 1991 with that of 2005, and suggest that the dimensions differentiating the divisions/interest groups remained the same. While Mass Communication remained at the center of the affiliation network, the Communication and Technology and Political Communication divisions became more central. The results of the semantic network analysis indicated that Philosophy and International/Intercultural Communication were the most central divisions, with Interpersonal and Information Systems at the periphery, along with newly formed interest groups, such as Intergroup Communication and Game Studies. Also, they found a significant correlation between the semantic and the joint membership networks.

Scholars have also examined communication by studying the citation patterns within the field and between communication and other disciplines. Reeves and Borgman (1983) found that journals from 1975 to 1979 clustered into two groups: speech communication and mass communication. Rice, Borgman, and Reeves (1988), and So (1988) examined the citations among a larger number of communication journals for 1977–1985, and found the citation patterns were consistent with Reeves and Borgman. Leydesdorff and Probst (2009) analyzed journal-to-journal citations among ISI Communication, Political Science, and Social Psychology journals, and found a specific set in communication to be developing, notably in their "being cited" patterns, suggesting the evolution of the field into a unified discipline. Barnett et al. (2011) examined the citations among ISI's communication journals for 1998–2007, as well as the citations to and from other disciplines' journals. They found three separate clusters: a well-connected group of mainstream journals and two isolated collections of journals characterized as technical writing and text analysis.

This chapter represents a continuation of the previous research that was based on the social and semantic network analysis of the joint memberships in the ICA's divisions and interest groups, and the shared use of symbols in paper titles presented to its divisions/interest groups. First, it extends the previous social network analysis based on joint memberships in the ICA's divisions and interest groups by adding the examinations of co-authorship among scholars from different countries, and relationships between divisions/interest groups and the authors' countries of origin. This represents the first attempt to examine how globalization has impacted the discipline, in general, and specifically, the ICA.

ICA is the largest scholarly organization devoted to the study of communication, from a variety of theoretical perspectives, with more than 4,500 members from 80 countries. Also, this research broadens the previous semantic network analyses of the concepts in ICA conference paper titles by addressing not only how different divisions and interest groups have used the concepts in conference paper titles, but also how scholars from different countries have used them. Specifically, the social and semantic network analyses study the structure of communication research on the global level by examining the evolution of the structures of joint membership networks of ICA divisions and interest groups between 1991, 2005, and 2016, as well as by exploring the relations among the ICA's divisions/interest groups, the scholars' countries of origin, and the concepts used in the titles of conference papers between 2013 and 2016. The research questions addressed are:

RQ1: What is the structure of ICA in 2016 based on joint membership networks of ICA divisions and interest groups, and what are the differences in the structures between 1991, 2005, and 2016?
RQ2: For the papers presented at the ICA meetings in the period of 2013–2016, which countries share the most co-authorships?
RQ3: For the 2013–2016 ICA meetings, what are the distributions of divisions and interest groups in terms of scholars' countries of origin?
RQ4a: For the 2013–2016 ICA meetings, what concepts do the different divisions and interest groups use to study communication?
RQ4b: For the 2013–2016 ICA meetings, what concepts do scholars from different countries use to study communication?

Method

Data

Four sets of data were used to describe the structure of communication research in the context of ICA. One, a joint membership network was generated using the 2016 Membership Directory. A roster that indicated 3,993 members' participation in ICA's 29 divisions and interest groups was obtained from the organization in July 2016. They are listed in Table 2.1. At the time of writing, a division must have 5% or more of active ICA members for two consecutive calendar years, a history of at least one formal interest group review, and the approval of its bylaws by two-thirds of the ICA board. Interest groups are formed when a petition including at least 3% of ICA membership and when they demonstrate an emerging scholarly interest through successful pre- and post-conferences for three consecutive years or a record of scholarly publications on the topic. An interest group requires a majority vote of the board of directors. These rules, however, have evolved and may have not applied in the same manner during the original times that different groups or divisions developed.

While an ICA member may register for a single division or interest group, a joint membership is defined by an individual's registration in two or more divisions/interest groups. The first divisional membership is free. Each additional affiliation costs $3.00. The average number of divisions or interest groups memberships for an ICA member is 2.3.

A second set of data was used to describe the co-authorship network based on papers presented at the ICA meeting from 2013 to 2016. Two or more authors from different countries writing a paper together define a co-authorship. The third set of data used to describe the divisional/interest group structure of the organization was based on the shared countries of

origin of the authors of ICA papers. A two-mode social network was created to illustrate the distribution of ICA papers presented to different divisions/interest groups in terms of authors' countries of origin for 2013 to 2016. The fourth data set used to describe ICA's semantic network was based on the titles of ICA papers. A total of 12,116 papers in the program presented specifically to divisions or interest groups, excluding panels, theme programs, and other association-wide programs, were included in the analysis. Each title was labeled with its division/interest group, and the author(s)' countries of origin. Two semantic networks were created. One describes the divisional/interest group structure based on the use of shared concepts in the titles of conference papers. The other describes the structure of authors' countries of origin based on the use of shared concepts in the conference papers' titles.

Procedure for Social Network Analysis

Network analysis is a set of research methods for identifying structures in systems based on the relations among the system's components (Rogers & Kincaid, 1981). In this study, the system is the ICA; the components are its divisions and interest groups, and the countries of origin of authors' ICA papers. For the joint membership (RQ1) and co-authorship networks (RQ2), the data sets in network analysis are two n x n matrices **S**, where n indicates the number of nodes. A node is a basic unit of analysis (the divisions and interest groups or the authors' countries of origin) that constitutes the system. While ICA had 29 divisions/interest groups in 2016, authors from a total of 82 countries presented papers at ICA meetings between 2013 and 2016. Each cell sij contains the relational strength between nodes i and j. For the affiliation network, it is the number of joint memberships among the divisions and interest groups; for the co-authorship network, it is the number of co-authorship between countries. For RQ3, the data set used in network analysis is a two-mode n × m matrix **S**, where n indicates the number of divisions/interest groups, and m the number of authors' countries. Each cell sij describes the number of authors who presented papers to a given division/interest group from a given country.

To answer RQ1, the centralities of divisions and interest groups in joint membership network in 2016 were calculated using UCINET (Borgatti, Everett, & Freeman, 2002). There are three indicators of centrality: degree, eigenvector, and betweenness centrality. Degree indicates the total number of shared memberships or ties with other divisions/interest groups. Eigenvector centrality is an overall indicator of how central a division/interest group is, such that the more central the divisions/interest groups it is tied to, the more

central it becomes (Bonacich, 1972). Betweenness indicates if a division/interest group lies on a path between two others. Divisions/interest groups with high betweenness potentially have some control over the interactions of the two nonadjacent divisions/interest groups (Freeman, 1977, 1979).

The results of degree and eigenvector centrality analysis in 2016 are compared with the centralities of ICA divisions and interest groups in 1991 and 2005 that were calculated by Barnett and Danowski (1992), and Lee and Barnett (2006).

To answer RQ2 and RQ3, the eigenvector and betweenness centralities of 28 divisions and interest groups (CIOS was not included) and the 82 countries in the co-authorship network were calculated using UCINET. Then, the Gephi software (Bastian, Heymann, & Jacomy, 2009) was employed to determine clusters within the network based on modularity (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008), which measures how well a network is divided into subgroups. Gephi was also used to visualize these networks.

Procedure of Semantic Network Analysis

Semantic network analysis is performed in three steps. The first step is to clean the texts and select the concepts for analysis. Concept selection in semantic analysis is based on the frequency of word occurrence (Hunter, 2014). The "stop words," which include articles, prepositions, conjunctions, and transitive verbs that do not contribute to the meaning of the text or distort the description of the text were eliminated (Danowski, 1993; Doerfel & Barnett, 1999; Kwon, Barnett, & Chen, 2009), and the text was stemmed. Stemming reduces words to their root form—generally a written word. The stem need not be the morphological root of the word. Related words may be mapped to the same stem. For example, stemming reduces the words "fishing," "fished," and "fisher" to the root word, "fish." 138 words whose frequency was equal to or greater than the mean (6) were retained for analysis.

The second step is to create two-mode semantic networks of division/interest group by concept (RQ4a) and country by concept (RQ4b). The data sets used in semantic network analysis are two two-mode n x m matrices S, where n indicates the number of divisions/interest groups (n = 28), and countries of origin of ICA papers' authors (n = 82), m (m = 138) is the number of concepts in the titles of ICA papers. In the division/interest group by concept network, each cell s_{ij} describes the number of times a concept is used by certain division or interest group; in the country by concept network, each cell s_{ij} describes the number of times a concept is used by scholars from different countries.

To answer RQ4a and RQ4b, the eigenvector and betweenness centralities of the 28 divisions and interest groups or 82 countries and the 138 concepts in the two-mode network of division by concept were calculated using UCINET. Gephi calculated the clusters and created the visual representations of these networks.

Results

Affiliation Network

Table 2.1 presents the normalized centralities of the divisions/interest groups in 1991, 2005, and 2016. The results indicate that Mass Communication and Communication Technology are the two most central divisions, with over 2,800 shared memberships in 2016. They have over twice the average number (1,355) of joint memberships and the highest degree, eigenvector, and betweenness.

Figure 2.1 illustrates the 2016 joint membership network. The size of the circles indicates the division/interest group's number of members. The lines connecting the circles indicate that they have more than the mean (48) memberships in common. The darker the line, the greater the number of shared memberships. The darkest line is between Mass Communication and

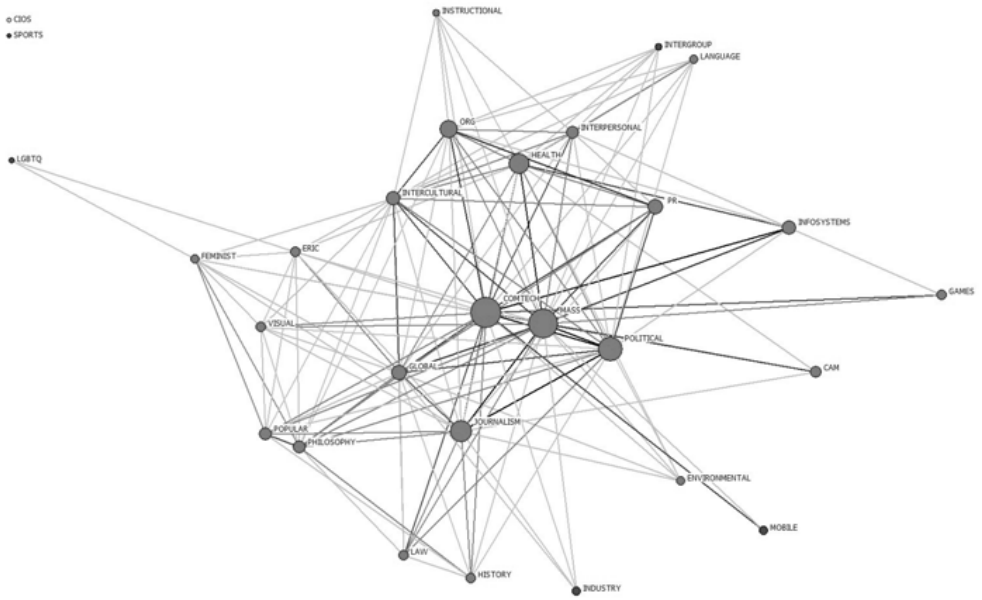

Figure 2.1: International Communication Association Affiliation Network—2016.

Table 2.1: The Centrality of Joint Membership in 1991, 2005, and 2016.

	Degree (No. of Ties)			Eigenvector			Betweenness	Members
	1991	**2005**	**2016**	**1991**	**2005**	**2016**	**2016**	**2016**
MASS	813	2,312	2,881	0.65	0.64	0.43	16.07	842
ORG	681	1,232	1,671	0.38	0.22	0.19	1.37	474
INTERCULTURAL	590	1,382	1,697	0.32	0.27	0.18	3.79	355
INTERPERSONAL	566	1,104	1,409	0.31	0.18	0.15	0.76	308
PHILOSOPHY	472	1,068	1,498	0.2	0.18	0.15	0.78	303
INFO	438	839	1,354	0.18	0.15	0.17	0.35	333
POLITICAL	424	1,318	2,247	0.22	0.3	0.34	3.55	686
CTECH	392	1,665	2,835	0.17	0.35	0.42	13.93	869
HEALTH	350	1,026	1,786	0.15	0.19	0.23	0.03	558
FEMINIST	324	637	1,193	0.13	0.09	0.11	2.87	206
INSTRUCTIONAL	318	562	1,001	0.13	0.08	0.1	0	152
PR	297	892	1,494	0.12	0.15	0.17	0.03	376
POPULAR	275	996	1,455	0.1	0.18	0.15	0.3	304
LANGUAGE		832	1,097		0.12	0.1	0	182
CLAW		799	1,260		0.15	0.14	0.33	217
VISUAL		719	1,220		0.11	0.12	0.09	219

JOURNALISM	533	1,954	0.09	0.27	4.05	580
CIOS	467	407	0.07	0.04	0	66
INTERGROUP	402	927	0.05	0.09	3.31	152
LGBTQ	305	817	0.04	0.07	0	113
ERIC	141	1,193	0.02	0.11	3.63	210
GAME	21	947	0	0.1	0	216
CAM		1,134		0.13	0	277
ENVIR		924		0.1	0	198
GLOBAL		1,837		0.21	0	382
HISTORY		1,114		0.12	0.03	222
INDUSTRY		754		0.08	0	171
MOBILE		773		0.09	0	176
SPORTS		403		0.04	0	70

• Eigenvector and Betweenness Centrality have been normalized.

Note: The centralities for 1991 and 2005 were calculated based on the previous work by Barnett and Danowski (1992) and Lee and Barnett (2006). According to the two articles, there were only 13 divisions and interests groups in 1991, 22 in 2005.

Communication Technology, which have 267 shared members, and Mass Communication and Political Communication, with 248 joint members. The interest groups, who are peripheral in the diagram, have only a few weak ties.

Lines between divisions/interest groups indicate joint memberships. 48 required for a link. The darker the line, the greater is the number. Solid lines indicate strong clusters, weaker ones are shown by dashes.

Figure 2.1 also shows the results of a cluster analysis, which was conducted to identify subgroupings within the association. In 2016, ICA is composed of three clusters and a dyad composed of Organizational Communication and Public Relations. The first cluster is related to Mass Communication. It consists of Mass Communication, Political Communication, Journalism Studies, Communication History, and Communication Law and Policy. The second cluster is centered about Communication Technology and includes Information Systems, Health Communication, and Interpersonal Communication. The cluster is composed of two more tightly connected dyads (Health Communication and Interpersonal Communication) and (Communication Technology and Information Systems). The third cluster is composed of two smaller groups, one with Feminist Scholarship, Visual Communication, Popular Communication, and Philosophy, Theory and Critique, and another with Intercultural Communication, Ethnicity and Race in Communication, and Global Communication and Social Change. The members of this cluster generally take a more humanistic approach to communication.

Figure 2.1 also displays two dimensions that differentiate ICA's divisions and interest groups. The first differentiates the humanities (left) from the scientific (right) divisions, and the second, those that focus on the individual, such as Interpersonal Communication (top) from those that take a more macro perspective, which generally deal with mediated communication (bottom).

These results are similar to those reported by Barnett and Danowski (1992). They found two dimensions, one that separated the humanistic from the scientifically oriented divisions/interest groups and another that differentiated interpersonal from mass communication. Also, they reported three or four clusters or subgroups, humanistic, mediated, and interpersonal, with the fourth that focused on information technology. This suggests that the overall structure of ICA has changed little over the last 25 years, despite the addition of seven new divisions and interest groups (Children Adolescents and Media, Environmental Communication, Global Communication, Communication History, Media Industry, Mobile Communication, and Sports Communication).

What have changed are the relative centralities of the divisions. As illustrated in Table 2.1, from 1991 to 2016, the following divisions have become more central. Communication Technology went from the eighth (of 13) to the second most central; Political Communication from the seventh to the third; and Health Communication from the ninth to the fourth. Other divisions have become less prominent. Organizational Communication was the second most central, and is now the fifth. Interpersonal Communication went from fourth to the tenth, and Intercultural and Development Communication third to sixth due to its fragmentation into three separate divisions—Intercultural Communication, Ethnicity and Race in Communication, and Global Communication and Social Change. These changes in centrality are reflective of ICA's members' interests in that they have come about due to the emergence of the information society with ubiquitous communication/information technologies and the process of globalization. In the early 1990s, ICA was primarily a North American organization whose members came from the traditional disciplines of Speech Communication and Journalism/Mass Media.

Co-authorship by Country

Table 2.2 presents the normalized centralities of countries in the co-authorship network whose degrees are equal to or greater than the mean (6). There are only 26 countries and regions that co-authored at least 6 papers with other countries. They are the core countries in the co-authorship network. The United States is the most central country followed by the United Kingdom, Germany, and China. The most co-authorships were between the U.S. and China (n = 239), followed by the U.S. and Germany (n = 60), the U.S. and South Korea (n = 49), and the U.S. and Israel (n = 30). A cluster analysis of the network ties resulted in two groups. Cluster one is centered about the United States and includes five East Asian countries, including China, Singapore, Japan, South Korea, and Hong Kong, along with India and New Zealand. The second cluster is centered about the UK and Germany. It is composed of 13 European countries, including Belgium, Switzerland, Spain, Finland, Sweden, Denmark, Italy, Norway, France, Greece, Portugal, Netherlands, and Austria. Canada and Israel are also members of this cluster. These results indicate that the United States shared the most co-authorships with the developed East Asian countries, while the European countries shared the most co-authorship with each other.

From 2013 to 2016, scholars from 24 countries and regions presented their papers on ICA meetings to at least seven, the mean number of divisions or

Table 2.2: Centrality measures of core countries in ICA co-authorship network.

	ID	Eigenvector	Betweenness	Cluster	Authors
1	USA	0.542	0.512	1	6,688
2	UK	0.411	0.067	2	558
3	GERMANY	0.404	0.107	2	834
4	CHINA	0.355	0.036	1	358
5	BELGIUM	0.311	0.014	2	264
6	SWITZERLAND	0.299	0.003	2	172
7	SPAIN	0.292	0.008	2	81
8	FINLAND	0.289	0.004	2	96
9	SWEDEN	0.274	0.008	2	233
10	DENMARK	0.272	0.002	2	156
11	CANADA	0.269	0.014	2	237
12	ITALY	0.249	0.005	2	43
13	NORWAY	0.235	0.004	2	75
14	FRANCE	0.228	0.01	2	36
15	ISRAEL	0.212	0.002	2	244
16	GREECE	0.209	0.001	2	11
17	SINGAPORE	0.204	0.014	1	249
18	PORTUGAL	0.199	0.027	2	31
19	JAPAN	0.173	0.002	1	71
20	RUSSIA	0.156	0	2	18
21	KOREA	0.15	0.001	1	216
22	NETHERLANDS	0.133	0	2	83
23	AUSTRIA	0.129	0	2	141
24	NEWZEALAND	0.129	0.001	1	83
25	INDIA	0.118	0.001	1	30
26	HK	0.115	0.001	1	63

• Eigenvector and Betweenness Centrality have been normalized.

interest groups. For divisions and interest groups, Political Communication, Communication and Technology, and Organizational Communication have the greatest eigenvector centralities, indicating the greatest number of countries presented their papers in these three divisions. In terms of betweenness centrality, Global Communication and Social Change is the most

central division, presenting papers from a great number of countries. The United States and China are the most central countries, presenting papers to the most divisions or interest groups, followed by Germany, Netherlands, Singapore, UK, Israel, South Korea, Belgium, and Spain. Consistent with the co-authorship network, three clusters emerged from the analysis, an East Asian cluster with China at the center, a German center group, and another centered about the UK.

Divisions/Interest Groups by Countries

Figure 2.2 present graphic representation of the international network based on the memberships in the divisions and interest groups for 2016. It illustrates the countries' relations. The size of the label indicates the number of authors' country of origin. Four clusters emerged from the analysis. The first cluster is centered about the United States. It includes 15 divisions/interest groups, including Organizational Communication, Global Communication and Social Change, Feminist Scholarship, Intercultural Communication, Health Communication, Communication History, Communication Law and Policy, Ethnicity and Race in Communication, Information Systems, LGBTQ Studies, Intergroup Communication, Language and Social Interaction, Instructional Communication, Interpersonal Communication, and Sports Communication. The results indicate that communication in the United States is the most comprehensive and diverse. Cluster 2 is centered about Communication and Technology, Environmental Communication, and Mobile Communication. China, Singapore, South Korea, Japan, and Taiwan are in this cluster, indicating the East Asian countries' emphasis of communication technology.

Lines between divisions/interest groups indicates joint memberships. 48 required for a link. The darker the line, the greater the number.

The third cluster is centered about Political Communication, Mass Communication, and Germany. It is composed of Children Adolescents and Media, Visual Communication and Game Studies, and seven European countries, including Netherlands, Belgium, Spain, Austria, Switzerland, Portugal, and Italy. The final cluster is centered about Journalism, Popular Communication, Communication Theory, and the United Kingdom. It is composed of Public Relations and Media Industries, and eight countries, including Canada, Finland, Australia, Hong Kong, Sweden, Denmark, and France. These results indicate that communication has two centers in Europe: Germany, focusing on political and mass communication; and the UK, focusing on journalism and communication theory.

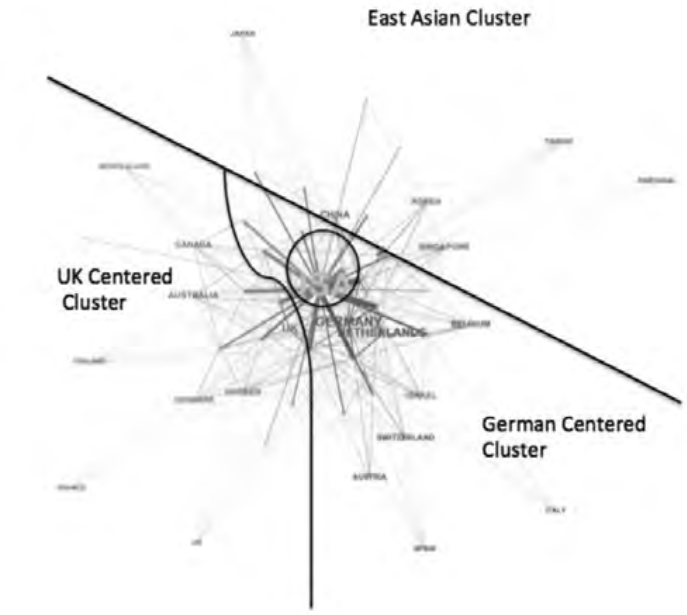

Figure 2.2: Network of country based on division/interest group membership—2013 to 2016.

Semantic Networks

Overall, Communication and Technology, Political Communication, and Health Communication are the most central divisions in the semantic network. The concepts *media*, *social*, and *communication* are the most central concepts. These concepts are used in the most titles of ICA papers by more divisions and interest groups. Table 2.3 shows the 20 most central (eigenvector centrality) divisions/interest groups and concepts in the six main clusters of the division by concept two-mode network. It shows which concepts the different divisions/interest groups commonly use to study communication.

The first cluster is arrayed about Global Communication and Social Change, and includes Intercultural Communication, Ethnicity and Race in Communication, Popular Communication, Philosophy, Theory, and Critique; Communication History, Communication Law and Policy, Feminist Scholarship, and Sports Communication. The members of this cluster generally take a more humanistic approach to the study of communication. The concepts *media*, *digital*, *case*, *China*, and *change* are the five most central concepts in this cluster. Cluster 2 is centered about Organizational Communication, and includes Public Relations, Intergroup Communication,

Table 2.3: Divisions and interest groups and concepts with greatest eigenvector centralities in six main clusters.

	Cluster 1		Cluster 2		Cluster 3	
1	**GLOBAL**	**0.230**	**ORG**	**0.208**	**CTECH**	**0.374**
2	media	0.169	**PR**	**0.206**	**MASS**	**0.348**
3	**POPULAR**	**0.156**	communication	0.164	**INFO**	**0.294**
4	digital	0.141	public	0.143	social	0.166
5	case	0.140	explore	0.132	online	0.158
6	China	0.120	**INTERPERSONAL**	**0.130**	research	0.135
7	**PHILOSOPHY**	**0.118**	engagement	0.108	theory	0.128
8	**INTERCULTURE**	**0.109**	relationship	0.105	effect	0.128
9	change	0.104	power	0.092	model	0.120
10	**FEMINIST**	**0.099**	perspective	0.089	network	0.111
11	TV	0.098	**LANGUAGE**	**0.075**	influence	0.108
12	**ERIC**	**0.094**	strategy	0.071	impact	0.106
13	**HISTORY**	**0.092**	crisis	0.070	perception	0.105
14	**CLAW**	**0.090**	collective	0.068	examine	0.098
15	USA	0.084	**INTERGROUP**	**0.067**	community	0.091
16	culture	0.084	discourse	0.059	data	0.088
17	life	0.071	group	0.055	understanding	0.088
18	age	0.069	identity	0.054	Facebook	0.085
19	challenge	0.065	management	0.050	**MOBILE**	**0.084**
20	international	0.062	**LGBTQ**	**0.048**	content	0.083

(*Continued*)

Table 2.3: (*Continued*)

	Cluster 4		Cluster 5		Cluster 6	
1	**POLITICAL**	**0.336**	**HEALTH**	**0.330**	**CAM**	**0.226**
2	**JOURNALISM**	**0.274**	role	0.126	study	0.149
3	news	0.134	information	0.115	**GAME**	**0.075**
4	political	0.108	**ENVIR**	**0.111**	video	0.067
5	framing	0.093	approach	0.097	young	0.061
6	comparison	0.082	health	0.096	longitudinal	0.059
7	attitude	0.077	behavior	0.088	game	0.057
8	coverage	0.073	support	0.076	literacy	0.038
9	knowledge	0.066	norm	0.071	people	0.036
10	source	0.061	efficacy	0.068	violence	0.036
11	opinion	0.055	context	0.064	play	0.036
12	press	0.051	message	0.064	investigate	0.034
13	negative	0.051	risk	0.058	peer	0.034
14	environment	0.051	adult	0.054	adolescent	0.034
15	selection	0.050	test	0.050	p1ict	0.033
16	issue	0.049	evaluation	0.050	youth	0.030
17	action	0.043	college	0.040	children	0.026
18	web	0.041	intention	0.038	mediation	0.023
19	participation	0.040	persuasion	0.037	viewing	0.022
20	discussion	0.039	food	0.032	involvement	0.021

• Division and Interest Groups are in CAPITALS.
Eigenvector Centrality has been normalized.

Interpersonal Communication, Language and Social Interaction, and Lesbian, Gay, Bisexual, Transgender & Queer Studies. In this cluster, *communication*, *public*, *explore*, *engagement*, and *relationship* are the most central concepts. The third cluster is composed of Mass Communication, Communication and Technology, Information Systems, and Mobile Communication. *Social*, *online*, *research*, *theory*, and *effect* are the most central concepts.

There are three other clusters composed of just two divisions/interest groups. They are: Cluster 4 with Political Communication and Journalism Studies, which contain *news, political*, *framing*, *comparison*, and *attitude*; the fifth cluster with Health Communication and Environmental Communication, in which *role*, *information*, *approach*, *health*, and *behavior* are central concepts; and a sixth cluster with Game Studies and Children Adolescents and Media, which include *study*, *video*, *young*, *longitudinal*, and *game*. In addition, there are two relatively isolated clusters: with Instructional Communication and Developmental Communication, in which *student* is the most central word, and a cluster with Visual Communication Studies, in which *analysis* and *image* are the most central words.

Discussion

This chapter describes the differences in the structures of joint membership networks of ICA divisions and interest groups in 1991, 2005, and 2016. Also, it describes the structure of communication research presented to ICA between 2013 and 2016 through an examination of the co-authorship of papers presented at ICA meetings; the global distributions of divisions/interest groups of Communication in terms of members' countries; and concepts different divisions/interest groups and countries use to study communication. Together, these results will help us better understand the field of communication as it is currently constituted in the global academic environment.

From the perspective of divisions/interest groups, the structure of ICA has changed little over the last 25 years, despite the addition of new divisions and interest groups, and an enlarged membership from around the world, which have enriched the field. What have changed are the relative centralities of the divisions. Communication and Technology, Political Communication, and Health Communication have become more central. Also, these three divisions are the most central divisions in the semantic network indicating that the most frequent concepts in the titles of ICA papers can be found in the titles of papers presented to these divisions. In particular, the changes in centrality of Communication and Technology are reflective of ICA's

members' interests that have evolved with the emergence of the global information society.

Political Communication, Organizational Communication, and Global Communication and Social Change, as well as Communication and Technology, presented ICA papers written by scholars from the most countries. Although the centrality of Interpersonal Communication decreased, social media platforms, *Facebook* and *Twitter*, were identified as central terms in a cluster of division by concept network composed of Mass Communication, Communication and Technology, Information Systems, and Mobile Communication. This indicates not only the importance of new communication technology for the study of interpersonal communication, but also the challenge of technology on the boundaries and development of ICA's divisions.

Geographically, between 2013 and 2016, three regional centers emerged. The first center is the United States, which has the most authors and co-authorships with other nations. It acts as a liaison connecting the other two regional groupings, East Asia and Europe. The United States has the most co-authorship with East Asian countries—China, Singapore, Japan, and South Korea. Scholars from the United States also presented papers to the most divisions and interest groups. Communication in the United States is the most comprehensive and diverse.

China is a second center. Similar to the United States, scholars from China presented papers to many divisions and interest groups. This is probably because China has the most number of co-authorships with the United States. With rapid economic and technological development, China has become the East Asian center for the study of communication technology, environmental communication, and mobile communication. Chinese scholars emphasize the concepts *social*, *public*, *relationship*, *culture*, and *network*. Also, the concept *China* has become a new focus for many ICA divisions/interest groups, such as Global Communication and Social Change, and Intercultural Communication, Ethnicity and Race in Communication, and Philosophy, Theory, and Critique.

The third center is located among the European countries. They shared many co-authorships with each other. Germany and the United Kingdom are the two most important axes. Specifically, Germany has the second most number of authors, and the second most number of co-authorships with the United States. Scholars from Germany focus more on political and mass communication, and emphasize concepts related to media effects and online communication. The UK has the third most number of authors. Scholars from

the UK pay more attention to the study of journalism and communication theory emphasizing concepts related to political, digital media, journalism, TV, and framing.

In a global society, these regional differences are important in that they indicate that different parts of the world emphasize different aspects of the communication process and apply communication theory in diverse ways depending on the location of the researcher. These dissimilarities, as implied here, may be due to affiliations and co-authorship relations among communication scholars, or other cultural or historical factors. Further, they may have long-term implication for the ICA, suggesting that the organization may fragment into regional associations or be supplanted by organizations, such as the European Communication Research and Education Association and the Chinese Communication Association, focusing on distinct aspects of communication of provincial concern.

Finally, there are limitations to this research. The structure of the academic discipline at the global level is not fully depicted by one international organization, the ICA. There are other important international professional communication organizations that may have different structures, such as the International Association of Mass Communication Research (IAMCR). Also, it is also conceivable that other organizations may emphasize different aspects of communication. Future research should examine the results of this study to determine if they could be applied to the understanding the entire field of communication.

In conclusion, this chapter describes the structure of the ICA based on its member affiliations in the various divisions and interest groups in 2016, and through a semantic network analysis of the paper titles presented at its conferences from 2013 to 2016. It extended previous research by adding the examinations of co-authorship among scholars from different countries, and relationships between divisions/interest groups and the authors' countries of origin. Also, it broadens the previous semantic analysis of the concepts presented to ICA by how they have been used by scholars from different countries. The results indicate that the structure of ICA has changed little over the last 25 years, despite the addition of new divisions and interest groups and new members from around the world. What have changed are the relative centralities of the divisions. Geographically, three regional centers have emerged, the United States, East Asia, which focuses on the study of communication technology, and Europe, in which a German-centered subgroup examines political and mass communication, and a UK-centered subgroup, which focuses in journalism and communication theory.

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