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An analysis on communication theory and discipline

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Abstract This research explores the structure and status of theories used in Communication as an alternative for Communication discipline identity research and characteristics evaluation. This research assumes that communication theories are not only ongoing practices of intellectual communities, but also discourse about how theory can address a range of channels, transcend specific technologies and bridge levels of analysis. It examines widely-cited theoretical contentions among academic articles and the connections among these theories. Network analysis suggests that framing theory is the most influential of the identified theories (ranking first in frequency and degree, closeness, betweenness and eigenvector centrality) and serves to link other communication theories and theory groups. While mass communication and technology theories exhibited the highest centrality, interpersonal, persuasion and organization communication theories were grouped together, integrating sub-theories of each group. Framing theory was the most popular and influential communication theory bridging not only mass communication theories, but also interpersonal, technology, information system, health, gender, inter-cultural and organizational communication theories.

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Introduction

Despite tremendous progress in communication theory and research, the history of the communication field has been marked by a tendency towards theoretical fragmentation and an identity crisis (O'Sullivan 1999). Much of this tendency stems from the multiple theoretical traditions within the field, such as the critical, rhetorical, socio-psychological and semiotic traditions (Barge and Craig 2009; Craig 1999). These perspectives vary in their compatibility with one another, and research in each tradition may advance with only limited engagement with the others.

Scholars have built theories from systematic observation and evaluation, to explain not only one specific action, but also a group of actions or related phenomena (Littlejohn and Foss 2009). According to Kerlinger and Lee (1999), "theory" refers to a set of interrelated constructs, concepts, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena. Indeed, our knowledge of communication is largely packaged into theories of various types. At any given moment in certain fields, a prevailing theory is taken as true, such as relativity theory in physics or evolutionary theory in biology. In the social sciences, the many schools of thought make this ideal of a single fundamental theory unlikely, as different scholarly communities adopt different visions of what is normal or what is revolutionary in theory (Littlejohn and Foss 2009).

The Communication discipline was initially dominated by rhetoric and speech and mass media-oriented research, and later expanded its scope to new media, public relations, advertising and human communication (Barnett and Danowski 1992; Chung et al. 2009; Lee and Barnett 2006). For example, the International Communication Association (ICA) and National Communication Association (NCA) have also supported a steady increase of various scholastic approaches, with a tendency toward the investigation of new communication technologies as a key research agenda.

This research examines the theoretical structure of Communication as an alternative for the identity research and evaluation of the Communication discipline. It assumes that communication theories are not only ongoing practices of intellectual communities (Anderson 1996), but also discourse about how theory can address a range of channels, transcend specific technologies and bridge levels of analysis. The basic premise is that Communication as a field of theoretical investigation has generated a wide range of perspectives, and the evolving nature of communication is induced by an intrinsic propensity to accommodate new ideas and orientations (Ayish 2003). Consequently, this research explores the structure and status of the theories used in Communication, and examines widely-cited theoretical contentions among academic articles and the connections among these theories which might represent a conceptual merging or bridging and scholarly linking.

Literature review

Communication discipline identity

Communication as a discipline in the larger structure of academia has been a source of considerable debate over the past several decades. Communication is often perceived as an

interdisciplinary clearinghouse for other disciplines (Craig 1999). The *Journal of Communication's* (1983) special edition, "Ferment in the Field," identified clearly-distinguished epistemological lines of study (i.e., science and humanities) within the field of communication. Furthermore, Rogers and Chaffee (1983) pointed to a large gap between mass communication and interpersonal communication, with each side having its own "functional autonomy"—a claim supported by many other researchers (Berger and Chaffee 1988). Other scholars have argued that the field is more complex than this suggested dichotomy between mass and interpersonal communication (Wiemann et al. 1988). Wiemann et al. (1988) suggested that communication research can be categorized by unit of analysis (e.g., macro versus micro) as well as channel (i.e., mass versus interpersonal). Such a divide might also be defined according to a theoretical or applied orientation, empirical or critical perspective, or even methodological differences (Chung et al. 2009).

While some elements of this differentiation have remained constant for decades, other trends suggest broad evolutionary changes in the field. Barnett and Danowski (1992) identified three dimensions that differentiate scholarship in communication, based on a network analysis of ICA membership. They asserted that the most essential distinction within the field is the scientific-humanistic separation, and that the field can be further defined according to mass (mediated) versus interpersonal, and theoretical versus applied. Lee and Barnett (2006) replicated Barnett and Danowski's (1992) study, identifying a structural shift in communication between 1991 and 2005 due to scholars' increasing attention to new communication technologies.

Communication as a practical discipline was constructed upon the idea of communication as an increasingly central focal point in our culture (Craig 2003). Some scholars have adopted a post-modernist perspective in addressing communication's interdisciplinary nature. According to Craig (1993), Communication is not required to fit the conventional sense of an institutional discipline. Rather, researchers can gain a broader contextual comprehension of practical human issues through social relevance, instead of through fields that remain stuck in limited applications due to their use of multi-discipline-compatible tools. As an intellectual tradition, the field remains radically heterogeneous and largely derivative. Rogers (1994) argued that the history of communication study would be the story of the social science. In some respects, such attributes of communication bring into questions the independency of Communication as a discipline (Barnett et al. 2011).

Discipline identity research from positivistic perspective

The purpose of this study is to categorize and clarify the theoretical structure of Communication as constructed by the major journals from various academic organizations. The measurement and analysis of such categorization criteria may involve the use of diverse methods (Chung et al. 2009), including semantic network analysis, social network analysis, and bibliometric analysis. Semantic network analysis, which examines structural relations among units of meaning (words or phrases), is widely used to identify the simultaneous occurrences of key terms in abstracts or titles of research papers to clarify the degree of intellectual connectivity among the studies. Semantic network analysis has extensively been used to examine the structure of Communication (Doerfel and Barnett 1999).

Another analytic method used to understand the structure of Communication Studies is social network analysis, which may be used to determine the similarities or closeness among actors through the affiliation data of communication-related academic organizations. Social network analyses of affiliations of communication organizations have been

conducted by Barnett and Danowski (1992), Doerfel and Barnett (1999), Lee and Barnett (2006) and Chung et al. (2009).

Finally, the most commonly used analytic method is bibliometric network analysis, which compares research reference lists or measures similarities among their journals, and connections between individual researchers or citations/co-citations. Many communication scholars have performed citation/co-citation network analyses to map the field (e.g., Barnett et al. 2011; Feeley 2008; Funkhouser 1996; Kim and Barnett 2008; Park and Leydesdorff 2009; Rice et al. 1988).

In spite of its popularity and performance, bibliometric network analyses have mostly examined the frequency of citation, and questions remain about the validity of these results. As Leydesdorff (1998) argued, citation could be the result of the interaction between networks of authors and between networks of their communications. Therefore, theoretical approaches have been examined in several subfields of communication such as intercultural communication and political communication.

Communication theory is enormously rich in the range of ideas that fall within its nominal scope, and new theoretical work on communication might need. There is no current knowledge of the most prevalent theories used in communication. This research examines this theoretical structure based on the assumption that communication theories are not only a set of textual propositions so nominated, but current practices of intellectual communities (Anderson 1996). Thus, this exploration both describes contemporary status of theory usage in the field and provides insight into current research practice.

Research questions

Although communication research is diverse and comprehensive, research relevant to the issues raised in this study is lacking. Network research that investigates the theoretical structure of the communication discipline is especially scarce. The current research addresses the following research questions.

RQ1: What are the most frequently used theories in the field of communication?
RQ2: What are interrelationships among these theories?

There has been a considerable split between mass communication and interpersonal communication studies (Rogers and Chaffee 1983) as evidenced by previous research (e.g., Barnett and Danowski 1992; Lee and Barnett 2006). However, Reardon and Rogers (1988) challenged the intellectual separation of interpersonal and mass media communication, arguing that this division was primarily the result of historical convenience and university politics. In a sense, Barnett and Danowski's (1992) identification of a clear distinction between ICA divisions related to mass media studies and its divisions focusing on interpersonal communication was not based on the theoretical associations among each division, but on a false dichotomy that the discipline has traditionally taken for granted. It is important to examine whether such a distinction results from theoretical proximity or from arbitrary tradition. Thus, this study asks,

RQ3: Does the traditional distinction between mass and interpersonal communication have a basis in theoretical association and proximity?

As Wiemann et al. (1988) suggested the communication field may be more complex than this straightforward dichotomy suggests. For example, Lee and Barnett (2006) found some divisions tied together in terms of scholars' interest in the specific topics, such as the influence of technologies on communication process at the individual or organizational

level or health issues. However, it is unclear whether such a linkage in the divisions that share interests is related to common theories. Consequently, this research investigates the following question;

RQ4: Does the research focusing on similar topics (e.g., technologies or health related issues) cluster together in terms of the association in the theories on which the research is based?

Methods

Data

To address these research questions, this study examined articles published in the major non-specialized communication journals that report empirical research in terms of data collection method, data analysis method, and the subject of study. Every issue of four journals from 2000 to 2009 was examined—*Journal of Communication* (JOC, vol. 50 no. 1–vol. 59 no. 4), *Human Communication Research* (HCR, vol. 26 no. 1–vol. 35 no. 4), *Communication Monographs* (CM, vol. 67 no. 1–vol. 76 no. 4), and *Communication Research* (CR, vol. 27 no. 1–vol. 36 no. 6), which are the four central journals in the field of communication based on citation results such as Google Scholar journal citation statistics (Levine 2010) and more often cite communication journals (Feeley 2008). *Communication Theory,* one of central journals, was not included in the analysis since rather than reporting empirical research that evaluates established theories it is primarily a venue for the debut of new theories or theoretical development.

The procedures employed by Anderson (1996) to identify theories were used in this study. This method included any theory that was "named" (whether as a theory or using a synonym such as hypothesis, approach, proposition or model) and followed by a "catering" citation to a related scholarly discussion of the theory. Many potential entries failed one or the other criterion. For example, several authors discussed a direct effect theory of mass media, but failed to offer a citation to support its existence, while some citations that were not grouped under a named theory were presented during discussions.

Through this nomination process, Anderson (1996) counted 249 entries, 195 of which were single-entry selections while eighteen theories were identified by three or more of the authors or author teams. In comparison, the present study identified 89 theories that appeared more than three times in the 1,156 research articles of the four journals. 785 of these articles met Anderson's requirements for inclusion in the study (177 articles out of 238 from HCR, 301 articles out of 404 from JOC, 127 articles out of 222 from CM, and 180 articles out of 292 from CR). The theory group (i.e., mass, interpersonal, health, technology communication theories) to which each theory belongs was determined by following the definitions and guidelines suggested by Littlejohn and Foss (2009).

Mass communication theories

Mass communication is the process by which a person, group of people, or large organization creates a message and transmits it through media to a large, anonymous, and heterogeneous audience. Mass communication theories are outlined into three categories: (1) theories about culture and society, (2) theories of influence and persuasion and (3) media use theories (Littlejohn and Foss 2009).

Interpersonal communication theories

Interpersonal communication is often explained by comparing it to mass communication. It examines how people in relationships talk to one another, why they select the messages they select, and the effect the messages have on the relationship and the individuals. Interpersonal communication theories fall into four categories: (1) theories about meaning in relationships, (2) theories about motives in relationships, (3) theories about messages in relationships, and (4) theories about movement in relationships (Littlejohn and Foss 2009).

Health communication theories

Health communication examines the role performed by human and mediated communication in the delivery of health care and the promotion of individual and public health. Health communication theories can be understood from four perspectives: (1) theories on health communication and the delivery of health care, (2) theories on health communication and the promotion of health, (3) theories on health and risk communication, and (4) theories on health communication and new information technologies (e-health) (Littlejohn and Foss 2009).

New technology theories

Recent technological advances and societal changes challenge traditional definitions of mass communication. Even new technology tends to blur the lines between traditional mass communication and interpersonal communication. New technology theories are being developed to address the changing nature of the media. They represent the extent to which new technology is being put to productive use, which in turn, determines the level of technological dynamism in media, organization, or society (Littlejohn and Foss 2009; Sarkar 2002).

Network analysis

Network analysis is a set of research methods used to identify structures in systems based on the relations among the system's components (Rogers and Kincaid 1981). Network analysis has been selected as a main research tool to investigate the structure of communication discipline through bibliometric, semantic, and affiliation analysis. The current study uses the method by investigating communication theories as nodes and visualizing their connections to measure directly, not by proxy, the structure of the discipline. In the current study, the system is the communication discipline as represented by communication journals, and the components (subsystems) are its theories. The basic data structure used in network analysis is an $n \times n$ matrix S, where n indicates the number of nodes. A node is a basic unit of analysis (in this case, a theory) that constitutes the system. Each cell S_{ij} contains the relational strength between nodes i and j. In communication research, the relationship is usually a function of the frequency of communication. In the present study, this relational strength refers to the frequency of theories co-occurring in articles.

The primary dataset for journals was defined as 785 (articles) $\times$ 89 (theories appearing at least three times), in which each cell was coded 1 for the presence of a theory and 0 for absence. It was pre-multiplied by its transpose to form an 89 $\times$ 89 matrix of joint (shared) theories. S_{ij} indicates the number of times both theory i and theory j are mentioned together.

Data analysis procedures

Centrality In network analysis, "centrality" refers to a measure of relative importance of a node within the overall network. The UCINET 6 network analysis program (Borgatti et al. 2005) was employed to measure various indicators of centralities of the communication theories: degree, closeness, betweenness and eigenvector centralities. Degree centrality indicates a node's number of links. Actors who have more ties to other actors may be in an advantageous position because they may have access to and be able to call on more of the resources of the network as a whole. Closeness is extent to which an actor is close to, or can easily reach all the other actors in the network. It focuses on the direct ties that an actor has, or the ties of the actor's neighbors, rather than indirect ties to all others. It usually measured by averaging the path distances. A direct tie is counted as 1 and an indirect tie receives proportionately less weight. Betweenness is extent to which an actor mediates between any other two actors on the shortest path between those actors. Betweenness centrality views an actor as being in a favorable position to extent that the actor falls on the geodesic paths between other pairs of actors in the network. It is usually averaged across all possible pairs in the network. Eigenvector is the extent to which a theory is connected to others who are central. Eigenvector centrality captures the comprehensive structure among the nodes, such that a node may be more central due to its relation to an even more central node. The principal eigenvector of the adjacency matrix of the network is a recursive version of degree centrality (Bonacich 1972; Freeman 1979; Hanneman and Riddle 2005; Monge and Contractor 2003).

Multidimensional scaling (MDS) The underlying idea behind multidimensional scaling is to map relational data based on the concepts of space and distance (Woelfel and Fink 1980). MDS is a generic term for examining the similarities or dissimilarities in data in a way that shows the structure of distance data as a geometrical picture. MDS may be employed when similarities or dissimilarities between objects are known and approximated by "physical" distances. In this study, metric MDS was used to analyze the structure of inter-theoretical relations in two-dimensional Euclidean space using UCINET 6.90 (Borgatti et al. 2005).

Results

Theory composition and frequency

Table 1 represented the 89 theories with frequency and centrality in the four journal publications. The most cited theory was framing theory (133), followed by priming theory (101), cultivation effect (68), agenda setting theory (65), elaboration likelihood model (57), uses and gratifications theory (49), third-person effect (47), social cognitive theory (43), self-efficacy theory (42), and social capital theory (38). Table 1 shows that mass communication theories were the most frequently cited in Communication, while the next most frequently mentioned theories address interpersonal communication.

Among the eighteen theories identified by three or more communication scholars by Anderson (1996), ten theories (agenda setting, cognitive dissonance theory, cultivation analysis, diffusion of innovations, source credibility, social judgment theory, spiral of silence, theory of reasoned action, uncertainty reduction theory and uses and gratifications)

were used at least three times in the four communication journals. Cultivation theory, diffusion of innovations and uses and gratifications were the most central.

Centrality

The degree, closeness, betweenness and eigenvector centralities reflecting the co-occurrences of theories identified the most influential theories (see Table 1). Degree centrality of the theory (number of direct links with other theories) network indicated that framing theory was the most central, followed by priming theory, social cognitive theory, cultivation effect, social identity theory, diffusion of innovations, elaboration likelihood model, self-efficacy and agenda setting theory. The top 10 theories of the highest closeness centrality (extent to which a theory is close to, or can easily reach all other theories) were framing theory, priming theory, social cognitive theory, social identity theory, cultivation effect, diffusion of innovations, elaboration likelihood model, identification theory, agenda setting theory and self-efficacy theory. The betweenness centrality (the extent to which a theory mediates between any other two theories on the shortest path between those theories) result showed that framing theory was noticeably central, followed by priming theory, social cognitive theory, social identity theory, cultivation effect, elaboration likelihood model, systems theory, reactance theory, self-efficacy theory and diffusion of innovations. Framing theory also was the highest in eigenvector centrality (extent that a theory is connected to others who are central), followed by social cognitive theory, priming theory, diffusion of innovations, elaboration likelihood model, cultivation effect, identification theory, social identity theory, agenda setting theory and self-efficacy theory.

Interestingly, in frequency social cognitive theory ranked 8th, while it was 3rd in degree, closeness and betweenness centralities and 2nd in eigenvector centrality. Also, while the frequencies of social identity theory and diffusion of innovations were outside of the top 10, they were in a high ranking of every centrality. On the contrary, the frequencies of agenda setting theory and uses and gratifications theory were less in proportion to their centrality compared to other core theories, which means they were cited by themselves or shared with minor theories. This suggests that social cognitive theory transcends the substantive cleavages between mass and interpersonal communication, communication technology and health and organizational communication. Rather, scholars it is applied in all areas of communication research.

Shared-theory networks

The most cited theories tended to be used with other theories resulting in a number of joint-theories. For instance, framing theory and priming theory had 37 joint appearances, followed by framing theory and agenda setting theory (29), priming theory and agenda setting theory (29), cultivation effect and priming theory (15), agenda setting theory and cultivation effect (11), social cognitive theory and self-efficacy theory (11), identification theory and cultivation effect (10), social presence theory and media richness theory (10), social presence theory and hyperpersonal perspective (9), framing theory and cultivation effect (9), third-person effect and presumed influence hypotheses (9), and heuristic model of persuasion and elaboration likelihood model (8). Among 89 theories excluding framing theory, 66 theories were accompanied with framing theory at least three times. Table 2 shows the matrix of the most shared 25 theories.

Table 1 Communication theories frequency and centrality

No	Theory	Frequency	Degree	Closeness	Betweenness	Eigenvector
1	Activation model	18 (32)	56 (31)	36.82 (28)	0.935 (28)	3.918 (30)
2	Affective disposition theory	5 (70)	13 (73)	33.716 (68)	0.031 (75)	1.218 (65)
3	Agenda building theory	9 (57)	37 (52)	34.375 (61)	0.054 (70)	7.581 (12)
4	Agenda setting theory	65 (4)	206 (4)	39.111 (9)	1.721 (15)	48.18 (3)
5	Assimilation effect	5 (70)	13 (73)	33.588 (69)	0.036 (74)	0.586 (79)
6	Attachment theory	6 (69)	22 (64)	34.375 (61)	0.346 (44)	1.685 (55)
7	Attribution theory	26 (21)	76 (22)	36.975 (24)	1.521 (18)	7.205 (14)
8	Balance theory	4 (76)	17 (68)	34.646 (57)	0.145 (61)	0.722 (74)
9	Cognitive appraisal theory	4 (76)	9 (82)	30.877 (83)	0.012 (80)	0.149 (84)
10	Cognitive dissonance theory	10 (54)	36 (53)	35.772 (42)	0.48 (40)	2.219 (44)
11	Communication accommodation theory	17 (36)	56 (31)	37.288 (19)	1.634 (16)	2.917 (39)
12	Communication privacy management	12 (48)	29 (58)	34.375 (61)	0.252 (50)	0.93 (70)
13	Control theory	7 (65)	15 (70)	33.083 (75)	0.084 (69)	0.716 (75)
14	Conversational constraint theory	4 (76)	11 (78)	33.46 (71)	0.101 (65)	0.702 (76)
15	Cultivation effect	68 (3)	208 (3)	39.819 (4)	3.241 (6)	27.15 (4)
16	Cultural I–C theory	23 (24)	47 (42)	35.484 (48)	0.246 (51)	3.948 (29)
17	Developmental theory	27 (18)	90 (16)	38.596 (11)	2.381 (12)	5.718 (20)
18	Differential gains model	4 (76)	10 (80)	31.655 (80)	0.009 (81)	0.578 (80)
19	Diffusion of innovations	28 (15)	107 (13)	39.819 (4)	2.535 (10)	10.933 (7)
20	Digital divide	8 (61)	31 (54)	35.484 (48)	0.38 (42)	2.442 (41)
21	Disinhibition effect	11 (50)	40 (49)	36.214 (35)	0.74 (31)	3.073 (37)
22	Ego enhancement theory	4 (76)	9 (82)	29.333 (85)	0 (84)	0.201 (83)
23	Elaboration likelihood model	57 (5)	151 (6)	39.819 (4)	3.374 (5)	12.085 (6)
24	Equity theory	8 (61)	28 (59)	34.783 (56)	0.133 (62)	1.096 (67)
25	Expectancy violation theory	18 (32)	53 (36)	36.066 (38)	0.632 (37)	2.188 (46)
26	Expectation states theory	11 (50)	24 (62)	34.109 (66)	0.027 (76)	2.213 (45)
27	Extended parallel process model	20 (28)	64 (27)	36.066 (38)	0.647 (36)	3.038 (38)
28	Face theory	10 (54)	20 (66)	33.588 (69)	0.159 (60)	1.358 (60)
29	Feminist theory	22 (26)	54 (33)	35.484 (48)	0.091 (67)	4.78 (24)
30	Framing theory	133 (1)	368 (1)	44.221 (1)	9.843 (1)	99.736 (1)
31	Gender-role theory	10 (54)	30 (57)	35.06 (53)	0.233 (53)	1.087 (68)
32	Genre theory	3 (85)	3 (89)	0 (89)	0 (84)	0 (89)
33	Halo effect	4 (76)	5 (87)	27.16 (87)	0 (84)	0.015 (87)
34	Health belief model	14 (39)	50 (40)	35.918 (41)	0.293 (47)	1.897 (54)
35	Heuristic model of persuasion	20 (28)	71 (25)	37.131 (22)	0.74 (31)	6.539 (17)
36	Hostile media effect	22 (26)	62 (28)	36.364 (32)	0.721 (33)	4.026 (28)
37	Hyperpersonal perspective	29 (14)	96 (15)	37.131 (22)	1.2 (23)	3.344 (35)
38	Identification theory	32 (12)	108 (12)	39.286 (8)	2.397 (11)	7.821 (11)
39	Identity negotiation perspective	3 (85)	6 (86)	31.095 (82)	0 (84)	0.258 (82)
40	Impression management theory	8 (61)	31 (54)	35.2 (52)	0.675 (35)	1.358 (60)
41	Inoculation theory	13 (44)	28 (59)	34.646 (57)	0.244 (52)	1.454 (58)
42	Interactionist theory	3 (85)	4 (88)	26.911 (88)	0 (84)	0.008 (88)

Table 1 continued

No	Theory	Frequency	Degree	Closeness	Betweenness	Eigenvector
43	Interpersonal deception theory	5 (70)	15 (70)	30.769 (84)	0.021 (77)	0.111 (85)
44	Knowledge gap	19 (31)	45 (44)	35.06 (53)	0.173 (56)	3.834 (31)
45	Life span approach	13 (44)	40 (49)	35.628 (44)	0.233 (53)	3.622 (33)
46	Media dependency theory	7 (65)	15 (70)	31.769 (79)	0.004 (82)	0.995 (69)
47	Media richness theory	20 (28)	74 (23)	36.975 (24)	0.773 (30)	2.053 (47)
48	Mental model	5 (70)	12 (77)	32 (78)	0.04 (73)	0.911 (71)
49	Model of memory	5 (70)	18 (67)	33.46 (71)	0.11 (64)	0.794 (72)
50	Mood management theory	5 (70)	10 (80)	32.353 (77)	0.161 (59)	0.633 (77)
51	Normative theory	7 (65)	22 (64)	34.241 (65)	0.089 (68)	1.932 (51)
52	Parasocial relationship	15 (37)	53 (36)	35.772 (42)	0.169 (57)	3.117 (36)
53	Pluralistic ignorance	14 (39)	53 (36)	36.066 (38)	0.302 (46)	3.389 (34)
54	Politeness theory	26 (21)	74 (23)	37.607 (16)	1.602 (17)	7.153 (15)
55	Presumed influence hypotheses	11 (50)	41 (48)	34.646 (57)	0.208 (55)	1.652 (56)
56	Priming theory	101 (2)	305 (2)	42.105 (2)	6.693 (2)	73.812 (2)
57	Problematic integration theory	11 (50)	45 (44)	35.628 (44)	0.285 (48)	2.028 (48)
58	Proteus effect	3 (85)	13 (73)	33.846 (67)	0.021 (77)	1.164 (66)
59	Reactance theory	18 (32)	53 (36)	36.975 (24)	2.833 (8)	2.712 (40)
60	Relational dialectics theory	4 (76)	13 (73)	33.208 (73)	0.05 (71)	1.223 (64)
61	Schema theory	13 (44)	45 (44)	35.628 (44)	0.262 (49)	6.058 (18)
62	Self-discrepancy theory	4 (76)	7 (85)	29.333 (85)	0.019 (79)	0.042 (86)
63	Self-efficacy	42 (9)	136 (7)	39.111 (9)	2.573 (9)	8.353 (9)
64	Signal detection theory	7 (65)	16 (69)	33.208 (73)	0.098 (66)	0.625 (78)
65	Social capital theory	38 (10)	100 (14)	37.931 (14)	1.335 (21)	6.982 (16)
66	Social cognitive theory	43 (8)	158 (5)	41.706 (3)	4.832 (3)	12.847 (5)
67	Social comparison theory	28 (15)	82 (19)	37.288 (19)	1.306 (22)	4.955 (23)
68	Social exchange theory	9 (57)	39 (51)	35.341 (51)	0.716 (34)	2.291 (42)
69	Social identification-deindividuation (SIDE)	15 (37)	68 (26)	36.975 (24)	1.071 (24)	4.313 (26)
70	Social identity theory	31 (13)	113 (11)	39.819 (4)	4.125 (4)	4.615 (25)
71	Social information theory of CMC	14 (39)	60 (30)	36.214 (35)	0.787 (29)	1.237 (63)
72	Social judgment theory	9 (57)	31 (54)	35.06 (53)	0.126 (63)	2.269 (43)
73	Social network theory	28 (15)	81 (20)	37.931 (14)	1.505 (19)	5.679 (21)
74	Social penetration theory	9 (57)	27 (61)	34.375 (61)	0.048 (72)	1.575 (57)
75	Social presence theory	27 (18)	90 (16)	36.515 (30)	0.971 (26)	2.016 (50)
76	Source credibility	4 (76)	9 (82)	31.655 (80)	0 (84)	0.262 (81)
77	Spiral of silence	25 (23)	79 (21)	37.447 (18)	0.993 (25)	5.66 (22)
78	Stigma theory	14 (39)	48 (41)	36.364 (32)	0.334 (45)	3.658 (32)
79	Structural hole	3 (85)	11 (78)	32.593 (76)	0.004 (82)	0.763 (73)
80	Structuration theory	18 (32)	47 (42)	36.214 (35)	0.538 (38)	1.917 (53)
81	Systems theory	23 (24)	62 (28)	36.515 (30)	3.01 (7)	1.387 (59)
82	Theory of planned behavior	14 (39)	54 (33)	36.364 (32)	0.496 (39)	1.332 (62)
83	Theory of reasoned action	27 (18)	89 (18)	37.288 (19)	0.935 (27)	7.277 (13)
84	Third-person effect	47 (7)	135 (8)	37.607 (16)	1.849 (14)	8.116 (10)

Table 1 continued

No	Theory	Frequency	Degree	Closeness	Betweenness	Eigenvector
85	Transportation theory	12 (48)	42 (47)	35.628 (44)	0.376 (43)	4.147 (27)
86	Two-step flow model	8 (61)	24 (62)	34.51 (60)	0.166 (58)	1.918 (52)
87	Uncertainty management theory	13 (44)	54 (33)	36.82 (28)	0.461 (41)	2.019 (49)
88	Uncertainty reduction theory	35 (11)	120 (9)	38.428 (12)	1.428 (20)	5.796 (19)
89	Uses and gratifications theory	7 (65)	15 (70)	31.769 (79)	0.004 (82)	0.995 (69)

MDS Analysis

The shared-theory network of Communication was analyzed using MDS. Figure 1 shows the shared-theory network that resulted from the links and their connection density among the nodes and the relative strengths of connections among theories.

The results supported the centrality and shared-theory network results of communication theories, indicating that framing theory is the most central and bridges other theories and theory groups. Theories of sub-discipline of the communication filed identified theory groups based on research focus and similarity. The mass communication theory group was the most central and included framing theory, priming theory, cultivation theory, agenda setting theory, uses and gratifications theory and spiral of silence. The communication technology and CMC related theory groups including diffusion of innovations, social identification and deindividuation (SIDE) model and hyperpersonal perspective were also central. Uncertainty reduction theory, social presence theory and expectancy violation theory were categorized into the interpersonal communication theory group. Persuasion theories such as social cognitive theory, elaboration likelihood model, self-efficacy, theory of reasoned action, extended parallel process model, pluralistic ignorance, and theory of planned behavior were broadly grouped in the group. The organization communication theory group included social identity theory, system theory, social exchange theory, equity theory and proteus theory. Health, gender, information system and inter-cultural communication theories were relatively peripheral.

The results of in-depth examination show the shared-theory network among a subset of theories focusing on similar topic clusters on which research is based. It clarifies that divisions linked by scholars' interests in specific common topics are bounded by theories. For example, the theory sub-structure of mass communication consisted of framing theory, priming theory, cultivation theory, agenda setting theory, elaboration likelihood model, spiral of silence, social cognitive model, diffusion of innovation theory, and third-person effect while that of interpersonal communication is composed of third-person effect, elaboration likelihood model, uncertainty reduction theory, theory of planned behavior, social cognitive theory, social comparison theory and attribution theory (see Figs. 2, 3).

Elaboration likelihood model, self-efficacy theory, third-person effect, theory of planned behavior, theory of reasoned action and health belief model make a health communication theory subset (see Fig. 4). Social information theory of CMC, Social identification-deindividuation (SIDE) model, hyperpersonal perspective, and social presence theory are gathered as a new technology theory group (see Fig. 5).

Table 2 Frequency of shared theories among top 25 theories

Theory	No	4	7	15	17	19	23	30	35	37	38	47	56	63	65	66	67	69	70	73	75	77	83	84	88	89
Agenda setting theory	4	65																								
Attribution theory	7	1	26																							
Cultivation effect	15	11	1	68																						
Developmental theory	17	0	3	0	27																					
Diffusion of innovations	19	7	0	3	1	28																				
Elaboration likelihood model	23	3	1	3	1	1	57																			
Framing theory	30	29	6	9	6	6	5	133																		
Heuristic model of persuasion	35	4	0	5	1	0	8	3	20																	
Hyperpersonal perspective	37	0	0	0	2	1	0	3	0	29																
Identification theory	38	1	1	10	0	1	1	5	1	0	32															
Media richness theory	47	0	1	1	1	2	0	0	0	3	2	20														
Priming theory	56	29	4	15	1	6	6	37	3	0	1	1	101													
Self-efficacy	63	2	2	5	1	2	4	1	0	0	6	1	5	42												
Social capital theory	65	2	0	5	0	3	1	4	0	1	3	2	2	1	38											
Social cognitive theory	66	3	1	7	1	3	3	5	3	1	4	2	7	11	1	43										
Social comparison theory	67	0	4	4	1	2	2	2	0	0	1	3	3	2	0	0	28									
SIDE model	69	0	1	0	2	0	1	5	0	8	0	2	1	0	0	0	1	15								
Social identity theory	70	2	0	0	0	2	3	2	2	1	2	3	1	1	1	4	1	2	31							
Social network theory	73	2	0	2	1	2	1	4	2	2	0	1	2	0	5	2	1	1	2	28						
Social presence theory	75	0	0	0	0	1	0	1	0	9	0	10	0	0	2	1	2	5	4	0	27					
Spiral of silence	77	2	0	3	1	0	0	2	0	1	3	1	4	3	1	1	1	1	1	0	0	25				
Theory of reasoned action	83	1	0	4	1	0	4	2	0	0	0	0	8	4	0	1	1	0	1	0	0	2	27			
Third-person effect	84	2	3	1	1	0	5	4	0	0	1	0	3	5	2	0	7	0	3	0	0	7	2	47		
Uncertainty reduction theory	88	2	2	0	7	3	2	3	1	6	0	4	2	0	1	2	2	4	6	2	5	0	0	2	35	
Uses and gratifications theory	89	5	1	9	0	1	1	3	1	0	1	2	4	0	3	5	1	0	0	0	1	1	1	1	0	49

Fig. 1 The structure of theory network. The size of the *concentric circles* shows the density of communication theories. The thickness of *the line* connecting two nodes is proportional to the connection density between the two nodes (Ties with at least three links are shown)

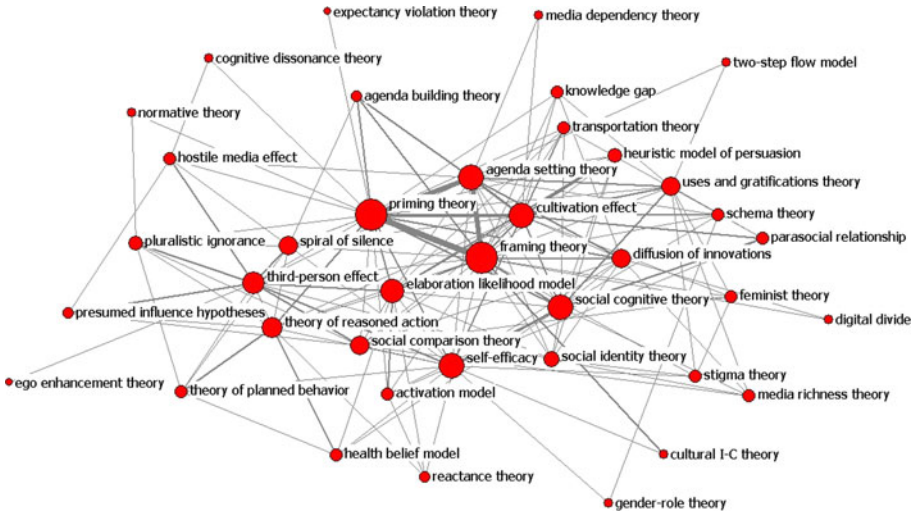

Fig. 2 The sub-structure of mass communication theory. The size of the *concentric circles* shows the density of mass communication theories. The thickness of *the line* connecting two nodes is proportional to the connection density between the two nodes (Ties with at least two links are shown)

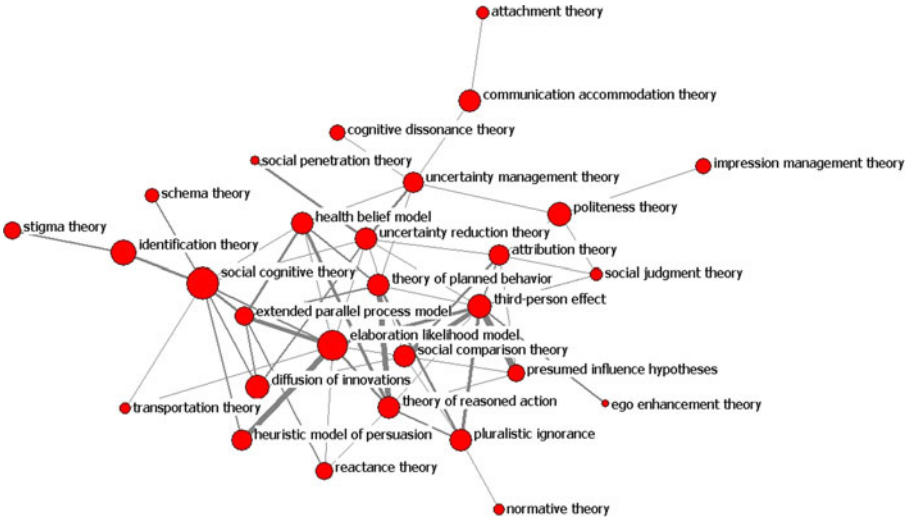

Fig. 3 The Sub-Structure of Interpersonal Communication Theory, Note: The size of the *concentric circles* shows the density of interpersonal communication theories. The thickness of *the line* connecting two nodes is proportional to the connection density between the two nodes (Ties with at least two links are shown)

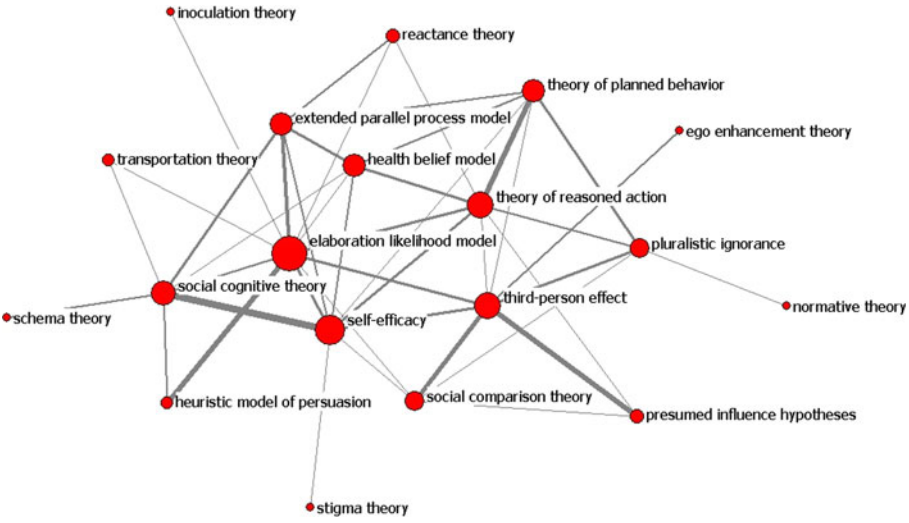

Fig. 4 The sub-structure of health communication theory. The size of the *concentric circles* shows the density of health communication theories. The thickness of *the line* connecting two nodes is proportional to the connection density between the two nodes (Ties with at least two links are shown)

Discussion

There is a lack of recent research on the theoretical structure of communication scholarship. To provide a better understanding of this theoretical complex, this research examined the structure and status of communication theories by analyzing the theories presented in the field's journals. Also, it identified the most prominent theories in academic articles and

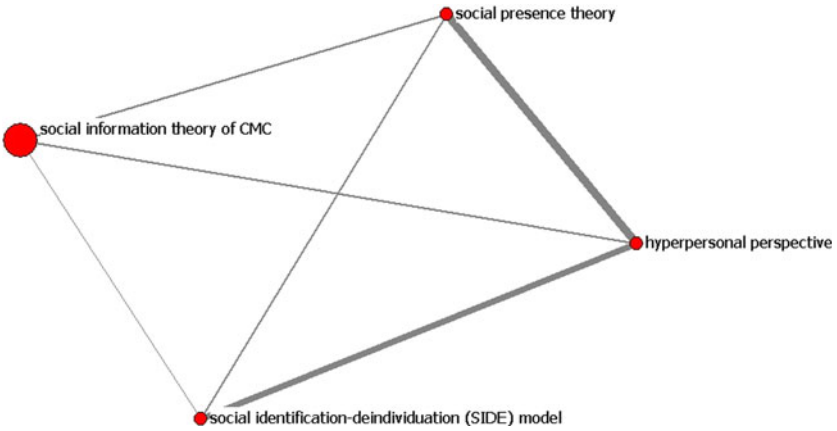

Fig. 5 The sub-structure of new technology theory. The size of the *concentric circles* shows the density of new technology communication theories. The thickness of *the line* connecting two nodes is proportional to the connection density between the two nodes (Ties with at least two links are shown)

their interrelationships. Given this context, the current research clarified the subject using network analysis of core communication journals.

Network analysis found that *framing theory* was the most influential (ranking first in frequency and every centrality). Mass communication theory and technology theory groups emerged as influential. While mass communication and technology theories exhibited the highest centrality, interpersonal, persuasion and organizational communication theories formed groups with each other integrating their sub-theories. Health communication, feminist scholarship, information systems, and inter-cultural communication theory groups were in the peripheral position (as are their membership networks, Chung et al. 2009).

The shared-theory network showed that framing theory was not only most popular, but serves to bridge other communication theories and theory groups (omnipresence and common to all across the communication discipline). Framing theory was the most influential, in that it accompanied near three quarters (66 of 89 theories) of communication theories. Also, it bridged the next most influential theories (priming theory, social cognitive theory, social identity theory, cultivation theory, diffusion of innovations, elaboration and likelihood model) from Communication's various sub-fields.

The strength and success of Communication should be gauged by how well researchers coordinate theories toward the end of elaborating and understanding complex communication processes (D'Angelo 2002; Halloran 1983). Although sporadic, the philosophical discussion regarding bridging of mass and interpersonal communication theory and research has continued (O'Sullivan 1999). A promising approach to this challenge of theoretical fracture has been indentified in framing theory.

Considering that framing theory has gained recent popularity in the examination of a variety of communication functions and has been applied to various contexts, it is interesting to examine whether it may function as a linking theory between mass and interpersonal theories. As an attempt to providing the comprehensive framework for mass communication theories and interpersonal theories, Berger and Chaffee (1987) argued that theories in the communication field might be better organized by communication functions (e.g., socialization, persuasion) or different communication contexts (families, health, cross-cultural) rather than the traditional dichotomy between mass and interpersonal communication.

Of importance here is whether the framing theory has the potential to work as a bridge between communication theories and sub-fields including mass and interpersonal communication. Among mass communication theories, there has been a consistent interest in the potential of the framing theory paradigm (D'Angelo 2002; Entman 1993; Matthes 2007). A research paradigm is defined as a general theory that informs the most scholarship on the operation and outcomes of any particular system of thought and action. The framing paradigm could be applied with parallel benefits to the study of public opinion and voting behavior in Political Science. It could also be associated with cognitive studies in Social Psychology and with class, gender and race research in Cultural Studies and Sociology. In particular, as Entman (1993) expected, Mass Communication studies would benefit from an explicit and common understanding of the concept of frames.

It is not surprising that CMC theories had a close connection with interpersonal theories rather than mass media theories considering that most of CMC theories were driven from the interpersonal communication theories based on face-to-face interaction. In addition, health communication theories were more connected with the group of mass media theories. Despite recent emphasis on interpersonal influence on behavioral or attitudinal changes, it seems that most research concerning health issues has focused on the influence of mass media. It is interesting to note that traditional communication theories, such as cognitive dissonance theories, communication accommodation theories, and social penetration theories were relatively isolated from the theory network. It might be because the theories are too old or too general to be used in the contemporary research or recent research trend may have bias toward applied research.

One could argue whether or not articles from just four journals lead to a better understanding of the Communication discipline, although the journals undoubtedly are the core outlets for scientific communication research. The authorship of the four journals comes from various institutions and sources. Articles published in these journals should be seen as the outcome of a complex process involving authors, editors, and their institutions. A limitation of this study is its focus on a limited (10 year) time frame. This raises the question, are the data and findings representative of communication?

Nevertheless, the primary implications of this research reside in developing the inter-theory networks with recent and available data that describes the structural connectivity among communication theories and provides a snapshot of how a segment of the field has been thinking over the last decade. This study also suggests that framing theory should be understood as a "linking theory" in Communication. Rather than focusing on every communication journal, the current study investigated only scientific research articles in four major journals. Such articles had a hypothesis, an approach, and a proposition or model with catering citation, in accordance with Anderson's (1996) theory identification procedure. The researchers assumed that accepted, published manuscripts represent the scholarly direction and characteristics of Communication discipline as an aggregate.

Clearly, this study's theoretical and methodological strategies address some of the drawbacks of previous research. It should be distinguished from past studies in that it provides a novel approach to understanding and clarifying the theoretical structure of Communication. If the analysis is expanded to examine longitudinal changes, or if additional methods such as bibliometric analysis are simultaneously applied, more meaningful conclusions about the changing trends in the field would be possible. Further research analyzing additional journals of various communication sub-fields is needed to gain a more comprehensive understanding and generalization of the current results, which will hopefully serve as a stepping-stone for future research.

References

Anderson, J. A. (1996). *Communication theory*. New York, NY: The Guilford Press.

Ayish, M. I. (2003). Beyond Western-oriented communication theories: a normative Arab-Islamic perspective. *Journal of the European Institute for Communication and Culture, 10*, 79–92.

Barge, J. K., & Craig, R. T. (2009). Practical theory in applied communication scholarship. In R. Frey & K. N. Cissna (Eds.), *Routledge Handbook of Applied Communication Research* (pp. 55–78). New York: Routledge, NJ.

Barnett, G. A., & Danowski, J. A. (1992). The structure of communication: a network analysis of the International Communication Association. *Human Communication Research, 19*, 264–285.

Barnett, G. A., Huh, C., Kim, Y., & Park, H. W. (2011). Citations among communication journals and other disciplines: a network analysis. *Scientometrics, 88*, 449–469.

Berger, C. R., & Chaffee, S. H. (1987). The study of communication as a science. In C. R. Berger & S. H. Chaffee (Eds.), *Handbook of Communication Science* (pp. 15-19). Newbury Park, CA: Sage.

Berger, C., & Chaffee, S. (1988). Bridging the communication gap. *Human Communication Research, 15*, 311–318.

Bonacich, P. (1972). Factoring and weighting approaches to status scores and clique identification. *Journal of Mathematical Sociology, 2*, 113–120.

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2005). *Ucinet 6 for Windows*. Harvard: Analytic Technologies.

Chung, C., Lee, S., Barnett, G. A., & Kim, J. (2009). A comparative network analysis of KSJCS and ICA in the era of hybridization. *Asian Journal of Communication, 19*, 170–191.

Craig, R.T. (1993). Why are there so many communication theories? *Journal of Communication, 43*, 26–33.

Craig, R. T. (1999). Communication theory as a field. *Communication Theory, 9*, 119–161.

Craig, R. T. (2003). *Discursive origins of a communication discipline*. Miami Beach, FL, USA: Paper presented at the annual convention of the National Communication Association.

D'Angelo, P. (2002). News framing as a multiparadigmatic research program: a response to Entman. *Journal of Communication, 52*, 870–888.

Doerfel, M. L., & Barnett, G. A. (1999). A semantic network analysis of the International Communication Association. *Human Communication Research, 25*, 589–603.

Entman, R. M. (1993). Framing: toward clarification of a fractured paradigm. *Journal of Communication, 43*(4), 51–58.

Feeley, T. H. (2008). A bibliometric analysis of communication journals from 2002 to 2005. *Human Communication Research, 34*, 505–520.

Freeman, L. C. (1979). Centrality in social networks: conceptual clarification. *Social Networks, 1*, 215–239.

Funkhouser, E. T. (1996). The evaluative use of citation analysis for communication journals. *Human Communication Research, 22*, 563–574.

Halloran, J. D. (1983). A case for critical eclecticism. *Journal of Communication, 33*, 270–278.

Hanneman, R., & Riddle, R. (2005). *Introduction to social network methods*. Riverside, CA: University of California, Riverside. Retrieved from http://faculty.ucr.edu/~hanneman.

Kerlinger, F. N., & Lee, H. B. (1999). *Foundations of behavioral research* (4th edn.). New York: Harcourt College Publishers.

Kim, H. J., & Barnett, G. A. (2008). *Social network analysis using author co-citation data*. Toronto, ON, Canada: Proceedings of the fourteenth Americas Conference on Information Systems.

Lee, S. J., & Barnett, G. A. (2006). *The structural change in Communication between 1991 and 2005: A social and semantic network analysis of the International Communication Association*. Dresden, Germany: Paper presented at the annual convention of the International Communication Association.

Levine, T. R. (2010). Ranking and trends in citation patterns of communication journals. *Communication Education, 59*, 41–51.

Leydesdorff, L. (1998). Theories of citation. *Scientometrics, 43*, 5–25.

Littlejohn, S. W., & Foss, K. A. (2009). *Encyclopedia of communication theory*. Thousand Oaks, CA: Sage.

Matthes, J. (2007). Beyond accessibility? toward an on-line and memory-based model of framing effects. *Communications, 32*, 51–78.

Monge, P. R., & Contractor, N. (2003). *Theory of communication networks*. New York, NY: Oxford University Press.

O'Sullivan, P. (1999). Bridging the mass-interpersonal divide. *Human Communication Research, 25*, 569–588.

Park, H. W., & Leydesdorff, L. (2009). Knowledge linkage structures in communication studies using citation analysis among communication journals. *Scientometrics, 81*, 157–175.

Reardon, K. K., & Rogers, E. M. (1988). Interpersonal versus mass media communication: a false dichotomy. *Human Communication Research, 15*, 284–303.

Rice, R. E., Borgman, C. L., & Reeves, R. (1988). Citation networks of communication journals, 1977–1985: cliques and positions, citations made and citations received. *Human Communication Research, 15*, 256–283.

Rogers, E. M. (1994). *A history of communication study: a biographical approach*. New York: Free Press.

Rogers, E. M., & Chaffee, S. H. (1983). Communication as an academic discipline: a dialogue. *Journal of Communication, 33*, 18–30.

Rogers, E. M., & Kincaid, D. L. (1981). *Communication networks: toward a new paradigm for research*. New York: Free Press.

Sarkar, J. (2002). Technological diffusion: alternative theories and historical evidence. *Journal of Economic Surveys, 12*, 131–176.

Wiemann, J. M., Hawkins, R. P., & Pingree, S. (1988). Fragmentation in the field and the movement toward integration in communication science. *Human Communication Research, 15*, 304–310.

Woelfel, J., & Fink, E. L. (1980). *The measurement of communication processes: Galileo theory and methods*. New York: Academic.