Journal of the Association for Information Systems

Volume 16 | Issue 12 Article 2

12-29-2015

Co-authorship, Homophily, and Scholarly Influence in Information Systems Research

Michael Gallivan
Georgia State University, mikegallivan@yahoo.com

Manju Ahuja
University of Louisville, Manju.ahuja@louisville.edu

Recommended Citation
Gallivan, Michael and Ahuja, Manju (2015) "Co-authorship, Homophily, and Scholarly Influence in Information Systems Research," *Journal of the Association for Information Systems*, 16(12), .
DOI: 10.17705/1jais.00416
Available at: https://aisel.aisnet.org/jais/vol16/iss12/2

Journal of the Association for Information Systems
JAIS

Research Perspective

Co-authorship, Homophily, and Scholarly Influence in Information Systems Research

Michael Gallivan
Georgia State University
mikegallivan@yahoo.com

Manju Ahuja
University of Louisville
manju.ahuja@louisville.edu

Abstract

Information Systems (IS) researchers have increasingly focused attention on understanding the identity of our field (Hirschheim & Klein 2003; Lyytinen & King 2004). One facet of any discipline's identity is the social aspect of how its scholars actually conduct their work (DeSanctis 2003), which is formally labeled as the study of sociology of science. Contributing to this tradition of work, we empirically examine scholarly influence (Acedo et al., 2006); scientific collaboration, including metrics that capture the prevalence of c-oauthored work; antecedents to co-authorship; and the effect of co-authorship on subsequent citations. Based on analyzing five leading IS journals for a period of seven years, we found that co-authored papers have become increasingly common in leading IS journals and that co-authoring continues to be more prevalent in journals published in North America compared to European journals. Moreover, we found significant effects of homophily related to gender, homophily/proximity, and geography. IS scholars worldwide exhibit a stronger preference for collaborating with co-authors of the same sex and those who attended the same PhD program than one would expect by chance. We also examined differences among journals and found some intriguing results for the effect of co-authorship on citations. Overall, we found evidence that the number of co-authors was positively related to citations although there was some variance across journals. These findings point to a need for more research to better understand both the processes of collaboration and the drivers and downstream benefits associated with it.

Keywords: *Co-authorship, Scientific Collaboration, Scientometrics, Social Networks, Sociology of Science.*

* Kalle Lyytinen was the accepting senior editor. This article was submitted on 7th February 2012 and went through two revisions.

Volume 16, Issue 12, pp. 980-1015, December 2015

1. Introduction

In 1996, Benbasat and Zmud initiated a dialog about the importance of establishing a central identity for the information systems (IS) field. In a pair of opinion papers, they lamented the lack of the IS field's relevance to practice and proposed that the IS community should find its core in the "IT artifact" (Benbasat & Zmud, 2003). Taking a different stance, first Lyytinen (1999) and later, Lyytinen and King (2004) offered contrasting views about the identity and relevance of IS research. Lyytinen and King (2004, p. 242) claim that, while IS needs intellectual discipline like any other field:

> *discipline will not be achieved by creating social conventions that define what is to be excluded and what is included, or establish rules about how members of the field must do their research. Discipline can come only from IS researchers themselves, interacting in the market of ideas.*

In a similar vein, DeSanctis (2003, p. 361) established her vision of IS identity as that which emerges through scholars' actions in a community rather than as a subject matter domain. She elaborates how discipline is an emergent property of communities:

> *To understand the state or progress of a discipline…is to understand the social dynamics of the research community (Price & deSolla, 1986). The measure of a discipline lies less in its outputs or artifacts than in the interactions of scholars…. The research process is inherently social – the joint processes by which scientists undertake their work…. An understanding of the discipline comes from a broad examination of its social life – of the characteristics of the scholarly community and of the communications among scholars over time.*

We adopt this alternative view of our field's identity in our work. DeSanctis (2003) suggested several approaches to understanding the social life of IS research. One approach relates to the pattern of collaborative relationships and other communications among scholars (Chin, Myers & Hoyt 2002). Researchers have found these collaborative patterns to be related to authors' scholarly influence (citation patterns) (Acedo, Barroso, Casanueva, & Galán, 2006). A community of practice perspective is consistent with the knowledge-based view of organizations whereby social interaction is the means by which knowledge is exchanged and created (Klein & Hirschheim, 2008; Nonaka & Takeuchi, 1995; Spender, 1996). Such social interaction is the lifeblood of knowledge both in formal organizations and in informal communities (Ahuja & Carley, 1999). Such self-reflection is important so that new norms, behaviors, and structures can be developed at academic institutions that foster the continued and increased production of ideas and innovation. Policy makers in the US and Europe have created incentives for university scientists for such a purpose because they form the engines of the innovation infrastructures. The dynamics of collaboration have important implications also since collaboration outcomes of scholarly productivity are tightly linked with of the reward structure in academia. Despite their importance, this topic has received little attention in general (Fox & Faver, 1984; Kyvik & Teigen, 1996; Lee & Bozeman, 2005) and not at all in the IS research domain. An in-depth exploration of these dynamics can potentially could potentially lead to factors and processes that can help mitigate the relationship of sex and collaboration (Bozeman & Gaughan, 2011).

Along the lines of the approach taken by similar research in other fields (e.g., Acedo et al.,2006), we adopt a network approach to examine co-authorship and citation outcomes to generate an in-depth understanding of the IS community of practice's collaboration dynamics. Although many other fields have used this approach to understand their state, the few scientometric studies published in the IS field have used just a subset of available scientometric techniques. They have focused, for the most part, on counting the research outputs of IS scholars, which has yielded various lists of the most prolific scholars (Athey & Plotnicki, 2000; Huang & Hsu, 2005), institutions (Clark & Warren, 2006), or most-frequently cited papers (Lowry, Karuga, & Richardson, 2007). To our knowledge, little attention has been paid to other types of social networks across the entire IS field, such as co-author networks

and co-citation networks (notable exceptions are Culnan (1986) and Culnan (1987))[1]. There are no published studies of co-authorship networks across the IS field as a whole; however, some studies have analyzed limited co-author networks for specific IS conferences, including ICIS (Xu & Chau, 2006), ECIS (Vidgen, Hennenberg, & Naude, 2007), ACM SIG CHI (Kaye, 2009), and IRIS (Molka-Danielsen, Richardson, Deutschmann, & Carter, 2007).

In this paper, we study collaboration directly by analyzing the antecedents, consequences, and temporal changes associated with collaborative work. Collaboration in this context refers to two or more scholars jointly engaged in actively producing knowledge. Scholars typically examine patterns of co-authorship in order to learn whether and how a field is using ideas from different subfields, reference fields, institutions, and geographic regions. To the extent that collaboration occurs across all of these facets, useful knowledge is more likely to be created and disseminated. For example, in this age of globalization, it is useful to know whether differences exist in levels of collaboration across different geographic regions and, if so, whether they have increased or narrowed over time. To do so, we compare IS journals from different geographic regions to assess the incidence of co-authorship.

Drawing on concepts from the social network paradigm, we analyze the antecedents of co-authorship at the individual and institutional levels. At the individual level, we investigate whether a demographic attribute (sex) shapes researchers' actual choice of co-authors. Prior studies in other business fields have posed similar questions, such as whether scholars have access to the opportunities that they seek to collaborate regardless of sex (Welsh & Bremser, 2005) and whether gender sorting (i.e., homophily) occurs in co-author selection (McDowell & Smith, 1992). Studies conducted more than a decade ago found that gender sorting occurs both in economics (McDowell & Smith, 1992; Boschini & Sjogren, 2007) and accounting (Welsh & Bremser, 2005). This is confirmed by more recent studies as well (McDowell, Singell & Slater, 2006). We consider the same question for IS reserachers: are IS scholars more likely to choose same-sex co-authors? At the institutional level, we also consider whether PhD program affiliation shapes IS researchers' choice of co-authors. Most importantly, we analyze one critical outcome that has been widely (but not universally) proven to result from the presence of more co-authors: increased citations.

This paper proceeds as follows: in Section 2, we review key sociology of science research in which we focus on studies that employ social network concepts. In Section 3, we describe our conceptual model. In Section 4, we describe the details of our data sources and methodology, and, in Section 5, we present the results. Finally, in Section 6, we discuss our findings and, in Section 7, discuss the study's limitations.

2. Theory Development

Academic research teams, unlike some other types of teams found in corporate settings, have much discretion in selecting collaborators. Therefore, it is interesting to examine how and why scholars choose their collaborators. In examining antecedents of collaborations, several forms of diversity affect creativity and innovation (Cady & Valentine, 1999; Joshi & Roh, 2009). However, researchers have shown homophily, which one can view as an antithesis of diversity, to be a key factor that affects how researchers select collaborators. This finding has implications for how new ideas are generated in fields and, thus, for their growth. Lungeanu and Contractor (2015) have suggested that homophily can be based on unobservable (such as cognitive or expertise diversity) or observable (such as gender and institutional diversity) factors. Here, we focus on focus on gender and institutional membership as two readily observable homophily attributes of team members that have usually been associated with social categorization processes (Van Knippenberg, De Dreu, & Homan, 2004).

The effect of homophily is also interesting because it can have contradictory effects. On the one hand, creating new knowledge relies on recombining ideas (Fleming & Sorenson, 2001) across diverse areas of the knowledge possessed in the team (West, 2002). On the other hand, research projects require team members to be comfortable working with each other (e.g., Guimera, Uzzi, Spiro, &

[1] See Culnan (1986, 1987) for studies of IS researchers' co-citation patterns up until the mid-1980s.

Amaral, 2005; Taylor & Greve, 2006). By understanding the dynamics of homophily, we can more effectively design reward structures that lead to more creative collaboration structures.

2.1. Sociology of Scientific Knowledge in the IS Field

Sociology of science examines knowledge creation as a social activity and is focused on "the social conditions and effects of science, and with the social structures and processes of scientific activity" (Ben-David & Sullivan, 1975, p. 203). It regards scholarly fields as advancing through the efforts of researchers who interact either through direct collaboration or indirectly (i.e., using citations to prior work as a form of communication). The most common methods for studying sociology of science include analyzing either collaboration networks or co-citation networks (Börner, Maru, & Goldstone, 2004; Tomassini & Luthi, 2007). As collaboration increases—both within and across different subject areas, institutions, and national borders—studies have shown that fields produce more knowledge because ideas with many origins cross-fertilize into new and innovative ways of exploring issues (Fleming, Mingo, & Chen, 2007; Qin, Lancaster, & Allen, 1997). Given the insights that can accrue from sociology of science research, we consider specific antecedents to co-authorship, such as time (i.e., changes in prevalence over time) and scholars' personal attributes (i.e., sex and the institution from which they received their PhD degree). After analyzing such precursors, we also study one outcome that may result from higher levels of co-authorship – citations – which is believed to reflect the level of knowledge creation or research quality. Others have shown that higher author productivity and greater knowledge contributions result from collaborative research (Laband & Tollison, 2000), presumably due to the synergy of authors' skills and ideas that give rise to knowledge.

Studies of collaboration and co-citation networks can be useful in revealing the extent to which a field has progressed as whole. For instance, the author co-citation analysis method can identify new research topics, which, in turn, reveal whether a field exhibits dynamic growth (e.g., Horn, Finholt, Birnholtz, Motwani, & Jayaraman, 2004; Raghuram, Tuertscher, & Garud, 2010) as opposed to being static over time. Such analyses can also reveal how subcommunities in a larger field may merge over time or, conversely, split apart. Collaboration in dyads or larger teams enables scholars to combine individual strengths to achieve synergistic outcomes. Sociology of science contains many examples that demonstrate the melding of divergent perspectives to yield creative outcomes (e.g., Edelson, 1998; Gordon, 1980; Maddox, 2003). The products of successful collaboration appear as research publications (Cronin, 1996; Katz & Martin, 1997) or, in industry, as patents, which play a critical role in developing a field. From a social network perspective, scholarly networks both reflect and reinforce an individual's potential knowledge capital. At an aggregate, macro level, these networks can explain the potential for advancing a field as a whole (Newman 2004a, 2004b). We first review social network analysis constructs to provide a conceptual lens for the various antecedents that we posit will facilitate co-authorship networks and their impact on knowledge production in the IS field.

2.2. Scientometrics Research in IS and Other Field

Scores of studies in IS, in related business fields, and in other social and physical sciences have examined scholars' research productivity and patterns of collaboration. Table 1 provides a framework that summarizes dozens of such studies. The vertical axis represents the unit of analysis these studies consider (individual scholar vs. relationships among scholars), while the horizontal axis represents the metric in question (a single published paper vs. citations to published work). Studies of author productivity appear in the top-left cell, while studies that identify leading scholars with the most citations to their work appear in the top-right cell. Likewise, studies analyzing patterns of co-authorship appear in the lower-left cell, and ones focused on author co-citation networks (which can reveal distinct topics and communities) appear in the lower-right cell. Studies from the IS field appear in bold.

The IS studies are depicted in bold to separate them from the studies in other fields. These studies identify authors with the most publications or most citations to their work in the top-left and top-right cells, respectively. Fewer IS studies appear in the lower half of Table 1. The ones that appear exist include older papers published nearly 30 years ago by Culnan (Culnan, 1986, 1987) or studies of single conferences (Kaye, 2009; Vidgen et al., 2007; Xu & Chau, 2006) or sub-areas of IS, such as knowledge management (Ponzi, 2002) or virtual work (Raghuram et al., 2010). Overall, we seem to

lack studies of co-author networks or co-citation networks that span the entire IS field since at least the early studies published by Culnan (1987).

Table 1. Framework Summarizing Prior Studies of Sociology of Science

	Articles	Citations
Studies focusing on individual scholars' output	Studies that count total number of papers: **Athey & Plotnicki (2000), Clark & Warren (2006), Galliers & Whitley (2007) (ECIS conf. only), Gallivan & Benbunan-Fich (2007), Huang & Hsu (2005), Lowry, Romans, & Curtis (2004), Zhang & Li (2005)** Studies in other fields: Beamish & Inkpen (1994) (international business), Cronin & Meho (2007) (library science), Hasselback, Reinstein, & Schwan (2003) (accounting)	Studies that count total number of papers: **Lowry, Karuga et al. (2007), Walstrom & Leonard (2000), Whitley & Galliers (2007) (ECIS conf. only)** Studies in other fields: Alexander & Mabry (1994) (finance), Cronin & Overfelt (1994) (library science),
Studies focusing on social networks among authors	Studies that analyze coauthorship patterns: **Henry, Goodell, Elmqvist, & Fekete (2007), Oh, Choi, & Kim (2006), Vidgen et al. (2007) (ECIS conferences), Xu & Chau (2006) (ECIS conferences)** Studies in other fields: Acedo et al. (2001) (management), Boschini & Sjogren (2007) (economics), Eaten, Ward, Kumar, & Reingen (1999) (consumer psychology), Fisher, Cobane, Vander Ven, & Cullen (1998) (political science), Glanzel (2002) (biomedicine, math, chemistry), Grant & Ward (1991) (sociology), Hollis (2001) (economics), Horn et al. (2004) (computer-supported cooperative work), McDowell & Smith (1992) (economics), Newman (2004a) (biology, math, physics)	Studies that analyze citation networks: **Culnan (1986, 1987), Ding, Chowdhury, & Foo (1999) (information retrieval), Gu (2004) (knowledge management only), Henry et al. (2007) (HCI conferences only), Ponzi (2002) (knowledge management only)** Studies in other fields Cronin & Shaw (2002) (library science), Otte & Roussea (2002) (social networks), Weisband, Thatcher, & Xu (2005) (virtual teams), White (2003 (library science), White, Wellman, & Nazer (2004) White & McCain (1998) (library science)
* We refer interested readers to a review of such studies in the social sciences (Gallivan & Benbunan-Fich, 2008)		

In other business fields (e.g., accounting and economics) and in the physical and biomedical sciences, however, scores of studies exists that correspond to *all* four cells of Table 1. The few studies listed in Table 1 from other fields serve as a representative (but not exhaustive) set of such studies. Most of them analyze patterns of co-authorship and citation outcomes.

Several insights emerge from a review of Table 1. First, IS scholars have published many studies that specify the field's leading scholars—whether in terms of authors with the most publications, most citations to their work (aggregated across multiple papers), or single papers with the most citations. Second, IS scholars publish many studies that specify the leading IS institutions—those with many productive and/or highly-cited researchers. Third, of the studies that identify individuals or institutions with outstanding achievements, none have examined either individual researchers' attributes (e.g., age, sex, professional rank, or country location) or the larger, institutional attributes[2] that serve as

[2] For instance, the institution's Carnegie classification, which is a typology of research emphasis for U.S. universities.

antecedents to authors' research productivity. Unlike other business topics such as accounting, economics, and management, the existing IS scientometric studies overlook institutional and personal attributes associated with authors' research contributions (e.g., the whether the institution has a PhD program and/or accreditation by AACSB or similar entities, such as EQUIS).

2.3. Relational Networks View and Homophily

We employ a relational perspective to examine IS collaborative activity. It is one part of the social network paradigm that uses patterns of relationships to explain social phenomena (Wasser-man & Faust, 1994). Researchers have frequently used the relational view to explain various organizational outcomes, such as similarity in employee attitudes toward a specific target, such as job rewards (Ho & Levesque, 2005), job attributes (Ibarra & Andrews, 1993; Meyer, 1994), or new technologies (Burkhardt, 1994; Rice & Aydin, 1991). The relational approach suggests that individuals may share similar attitudes due to *direct* contact with each other (Burt, 1980; Rice & Aydin, 1991) or indirect contact (such as having common affiliations with other groups or individuals) (Meyer, 1994; Rice, 1993). Both direct interpersonal contact and shared group affiliations may facilitate convergence in people's attitudes due to shared interpretations of the environment (Blau, 1964; Ibarra & Andrews, 1993; Meyer, 1994). In published research on social networks, individuals having a shared group affiliation is a stronger predictor of them having similar attitudes and behavior than direct inter-personal contact between members (Meyer, 1994) who occupy similar structural positions (Friedkin, 1993). In short, sharing some form of group membership best predicts social influence, followed by direct interpersonal contact and, lastly, structural equivalence. Accordingly, we focus on group affiliation as antecedents in two hypotheses (e.g., treating sex and shared PhD program affiliation as specific types of group affiliations that are antecedents to co-authorship).

Borgatti (2003) suggests that most recent social network research focuses on static snapshots of phenomena at a single point in time and, thus, that it neglects the dynamics of change. He further notes that much of this research has focused on the *consequences* of social networks while neglect-ing their antecedents (Borgatti & Foster, 2003). In our study, we respond to such limitations of social networks research by considering networks of co-authors as both a cause and a consequence of other, related constructs. We posit that one set of network outcomes (co-authorship) results from a preceding set of network structures (group affiliation, including membership in a specific sex or gender, and shared PhD institutional affiliation). Thus, we treat one form of social network as an antecedent to another type of network (specific co-authors linkages). A second critique often directed at social network research is that most studies are cross-sectional even when longitudinal designs are clearly warranted (Aldrich, 2001). By analyzing which co-author ties are more likely to emerge due to a specific demographic trait (sex) or a specific institutional affiliation (PhD program), we develop a dynamic view of change over time. We analyze publication data spanning seven years, and, by including historical data on authors' prior institutional affiliations, the patterns of co-authored publications, and subsequent citations to their work, we capture the antecedents and consequences of co-authorship networks in a longitudinal manner.

3. Conceptual Model and Hypotheses Development

Figure 1 shows our conceptual model of co-authorship's antecedents and consequences. The model proposes an upward trend in overall levels of co-authorship over time, geographic differences in the prevalence of co-authorship, *homophily* (Ibarra, 1995) as an antecedent of co-authorship, and higher citations as a consequence of co-authorship.

3.1. Increase in Co-authorship Over Time

Nearly 50 years ago, Price (1963, p. 89) observed that the rise of co-authorship reflected "one of the most violent transitions that can be measured in recent trends of scientific manpower and literature". Many studies covering a range of social sciences, such as economics (Hollis, 2001; McDowell & Melvin, 1983), biomedicine and physical sciences (Glanzel, 2002), and political science (Fisher et al., 1998), have observed the growing incidence of co-authored work. Cronin has identified an unusual trend of papers that contain scores or—in some cases, hundreds—of co-authors, which is labeled

hyper-authorship (Cronin, 2001; Cronin, Shaw, & La Barre, 2003). Therefore, we start by examining co-authorship trends to explain why co-authored research in IS has increased over time.

Figure 1. Conceptual Framework for Our Study

Research in other fields has identified several reasons why co-authored research has increased over time. First, long-distance collaboration is much easier than in decades past since scholars are no longer restricted to working alone or collaborating with whomever happens to be co-located with them (Kraut, Egido, & Galegher, 1990). Instead, researchers can collaborate with whomever they choose based on the expertise requirements of a project, their affinity for another scholar, and a host of other factors that are independent of distance, time zone, and institutional affiliation. Second, the increased costs of conducting research and greater specialization of skills required to publish leading-edge research are assumed to contribute to the observed increase in co-authorship in recent decades (Tomassini & Luthi, 2007). Perhaps an additional factor that may contribute to the trend of increasing co-authorships in IS the heightened competition and pressure for publications in "top" journals in order for IS scholars to achieve tenure and promotion (Dennis, Valacich, Fuller, & Schneider, 2006).

Various ways to assess the rising incidences of scientific collaboration exist. One broad stream of research has considered the increase in co-authors specifically, while another stream examines the rise of "sub-authors" (Patel, 1972, p. 80); that is, colleagues, informal reviewers, and seminar participants who receive mention in a paper's "acknowledgments" section for offering critical input or other assistance. Such "sub-authors" do not share authorship credit "on the front page". While we focus specifically on co-authorship and, thus, leave it to others to analyze trends in the number of sub-authors who receive acknowledgements (Cronin, 2001; Cronin et al., 2003), we later comment on this alternate form of authorship at the end of the paper. Even if we restrict ourselves to formal co-authorship, various metrics exist to measure it. One approach is to track the ratio of co-authored papers as a ratio of all papers published in a discipline over time (i.e., coding each paper as either solo authored or co-authored), known as the *incidence* of co-authorship (Laband & Tollison 2000). Another method is to determine the mean number of authors per paper each year for a given journal or for the entire field, which is known as *extent* of co-authorship (Glanzel, 2002).

The two metrics (incidence and extent of co-authorship) capture different information. For instance, it may be that, in a given field, the incidence of co-authorship has remained stable over the past decade at 70 percent of all papers but the extent of co-authorship reflects a steady increase from an average of 1.0 author per paper in 2000 to 2.1 authors per paper in 2010. Scholars use both metrics to provide comparisons across fields. For instance, comparing chemistry and biomedicine, Glanzel (2002) found that the incidence of co-authored publications was identical for both fields but the extent of co-authorship was consistently higher in biomedicine than in chemistry (a mean of 5.1 vs. 3.8 authors per paper). While the incidence and extent of co-authorship are somewhat correlated, each metric provides distinct information (Acedo et al. 2006); hence, it is useful to study both trends over time.

Researchers have cited many factors that offer stronger incentives to co-author today than in the past, such as a greater availability of co-authors due to an increase in the pool of PhD recipients in a given field (Fisher et al., 1998), increased complexity of conducting research (Hudson, 1996), and greater competition for limited journal space (Acedo et al., 2006). Rising standards for promotion and tenure

may encourage co-authoring because it is one way for faculty to increase their research output or, at the very least, to reduce downside risk; that is, "to insure against the risk of publishing nothing" (Hollis, 2001, p. 525). Regardless of the underlying factors that influence rates of co-authorship, we expect that the IS field will exhibit a rising incidence of co-authoring similar to the trends observed in recent decades across dozens of social and physical sciences fields. Thus, we posit:

H1: *Co-authorship among researchers has increased over time in leading IS scholarly journals.*

H1a: *The incidence (i.e., fraction) of co-authored papers has increased in IS journals over time.*

H1b: *The extent of co-authorship (number of authors) has increased in IS journals over time.*

3.2. International Differences (Journal Country Location as a Moderator of Co-authorship)

Among the many studies that examine changes in the prevalence of co-authorship, some have compared the rates of co-authorship across different fields and others have analyzed differences in the geographic location where a journal is published in a given field. For instance, for operations research journals, Eto (2000) found that both the incidence and extent of co-authorship were 30 percent higher in a leading North American journal (*Operations Research*), compared to a similar-ranked European journal (*Journal of Operational Research*). Similar results have been found in management (e.g., Matzler & Renzl, 2002). For example, Acedo et al. (2006) found higher rates of co-authorship in seven elite management journals published in North America compared to three leading European journals[3]. Another study comparing scholars from management journals in North America vs. Europe reported that the extent of co-authorship was 25 percent higher in North American journals (e.g., a mean of 2.3 vs. 1.8 authors per paper) (Matzler & Renzl, 2002). While such studies compare papers in journals from different geographic regions without identifying the underlying reasons, others argue that quantitative research usually features more authors (Moody, 2004) whereas qualitative, theory-building research is more likely to be solo-authored. Acedo et al. (2006, p. 960) claim that "specializations which have a higher quantitative content, especially those that require the application of sophisticated [quantitative] … methods, have a greater propensity for co-authored papers". Given the historical differences in the types of work published in North American journals vs. European journals (Chen & Hirschheim, 2004; Riedl & Rueckel, 2011), with the former featuring more quantitative studies the latter containing and qualitative, theory-building work research[4], we posit:

H2: *Co-authorship among IS researchers will be more prevalent in North American journals.*

H2a: *IS journals published in North America will exhibit a higher incidence of co-authorship.*

H2b: *IS journals published in North America will exhibit a greater extent of co-authorship.*

[3] Acedo et al. (2006) do not report values for extent or incidence of co-authorship; however, the continent where the journal is published was statistically significant in their analysis ($p < .001$, see Table 2, p. 964). The North American journals were: *Academy of Management Journal, Academy of Management Review, Administrative Sciences Quarterly, Management Science, Strategic Management Journal, Journal of Management,* and *Organization Science*. The European journals were *Human Relations*, *Organization Studies,* and *Journal of Management Studies*.

[4] We recognize that some leading IS researchers consider all IS journals to be "global" – and thus discount any country- or region-specific difference. However, the fact that, as recently as 2007, the Editors in Chief of leading European journals described their journals as having "a distinctive European perspective" (Paul, 2005, p. 207) or a "European spirit" (Rowe, 2010), we believe that regional differences in IS research still exist.

3.3. Homophily in Choice of Co-authors

Researchers have explained how individuals select collaborators via the notion of "scientific and technical human capital" (Boardman & Corley, 2008). In this conceptualization, researcher collaboration requires selecting members that can help to achieve a set of goals. The process of identifying and soliciting "appropriate" and complementary partners for collaboration is termed "activation" (Agranoff & McGuire, 2001; Lipnack & Stamps, 1994; Landau, 1991; Scharpf, 1978).

We posit here that homophily plays a key role in this activation process. In relational networks research, homophily refers to the likelihood of one's belonging to networks with others who are similar both in terms of demographics, background and personal values (Ibarra, 1992). Our next two hypotheses examine facets of homophily: specifically, the likelihood of authors choosing their partners on the basis of same-sex and shared institutional affiliation (indicated by PhD granting institution).

Similarity related to biological sex represents one dimension of homophily that affects how individuals form ties in many different settings, which range from friendship networks to professional ties in advertising firms (Ibarra, 1992; Leenders, 1996). In the case of scientific collaborations, researchers have investigated the effect of gender homogeneity on the outcomes of team work (Stvilia et al., 2011). Gender homophily leads to an increased ease of communication (Ibarra, 1992) and decreased levels of emotional conflict (Pelled, Eisenhardt, & Xin, 1999). In addition, research has shown men and women differ in their research collaboration patterns and strategies (Bozeman & Gaughan, 2011). Evidence about sex-based differences in collaboration may well impinge on a variety of crucial issues in structural issues but also such secondary effects as educational attainment, representativeness of the scientific workforce, recruitment and retention of scientific and technical human capital, and, perhaps, even the quality of the research itself.

Studies in other fields (such as economics and accounting) have found this effect quite consistently. Two studies of economists were the first to analyze who co-authors with whom. In the first, McDowell and Smith (1992) report that economists were more likely to co-author with a member of the same sex—a phenomenon they label *gender sorting*. Applying a different label (gender homogeneity), two Swedish economists (Boschini & Sjogren, 2007) replicated the study and examined gender neutrality of research team formation. Using data on Swedish economists, they confirmed the earlier findings. Considering the relative numbers of men and women with economics PhDs, Boschini and Sjogren (2007) concluded that women were twice as likely to publish with a female co-author than men[5]. A survey of 600 U.S. accounting faculty reached a similar conclusion: that authors were more likely to collaborate with co-authors of the same sex (Welsh & Bremser, 2005).

Although the IS field has a larger proportion of women than economics did a generation ago (estimates in the U.S. range from 14% to 30% women faculty in IS), women are still a minority[6]. We expect that IS scholars will also exhibit a preference for same-sex co-authors like their predecessors from accounting and economics regardless of whether we label it gender sorting (McDowell & Smith 1992), gender homogeneity (Fisher et al., 1998), or homophily (Ibarra, 1992). Thus, we posit:

> **H3**: *When researchers collaborate, they are more likely to choose a co-author of the same sex.*

[5] Men who co-authored had a 7 percent chance of publishing with a female author while women had a 16 percent chance.

[6] It is problematic that such estimates of the fraction of women in the academic IS field vary so much. The correct ratio depends on what one measures. For example, it is easy to estimate the fraction of papers by women in a specific journal (Kimery, Rinehart, & Mellon, 2003) or across a set of IS journals (Spruell & McCord, 2003). However, it is more difficult to estimate the proportion of PhD degrees awarded to women in IS (or in related fields from which the IS field draws researchers, such as information science or accounting IS). Aggregate data about the ratio of women among PhD degree recipients are scarce. Some studies ignore receipt of the PhD degree and instead specify the ratio of female IS faculty members; however, this approach is flawed since it will count faculty members without PhD degrees, such as instructors in teaching colleges, community colleges, and technical institutes. Such types of faculty rarely publish original research. Variations in the entity that is being measured are reflected in the range of estimates for women in the IS field, which range from 14.5 percent (the fraction of papers published by women in a set of leading IS journals) (Gallivan & Benbunan-Fich, 2007), to 25 or 30 percent faculty (Mangold et al., 1994) based on data from the American Association of University Professors. The latter is not restricted to faculty with PhD degrees.

As we note above, a second type of homophily that may influence scholars' choice of co-authors is institutional affiliation in the form of common research training. In most cases, scholars choose to collaborate with others they already know based on the likelihood they will belong to the same social circles, work in the same university or department, attend the same conferences, and so on. Since most researchers tend to concentrate collaborations on those in their own laboratory, research group, or academic department, the prevalence of women presents women with the possibility of proximate collaborations with women (Boardman & Corley, 2008). In sum, it is no longer patent that women have fewer collaborators than men. Further, research has shown that male and female scholars tend to inhabit different sex-based family and work-life balance situations (Ahuja, 2002) that may influence them to select collaborators who are in similar situations.

At the beginning of Section 3.3, we discuss the process of "activation", which involves identifying and soliciting suitable partners for collaboration (Lipnack & Stamps, 1994; Scharpf, 1978). In this regard, Boardman and Corley (2008) found that most scholars tend to focus their collaborations on members within their own departments and that proximity plays a role in activating collaborations.

To illustrate the importance of co-location in determining the choice of co-authors, Cronin and Shaw (2007) examined patterns of collaboration exhibited by the late Rob Kling, former Dean of the School of Library and Information Science at Indiana University and, before that, a professor at University of California, Irvine. In a tribute to Rob Kling, Cronin and Shaw (2007, pp. 225-227), emphasize the important role that co-location played in Kling's choice of collaborators[7]:

> *Place, rather than some objective or scientific factor, seems to have dictated who his collaborators would be.... Physical proximity didn't always dictate Kling's collaborations…, but it seems clear that location powerfully influenced his choice of collaborators at any given moment.... It makes one wonder to what extent physical location and convenience materially shaped Kling's daily working relationships and intellectual interactions and to what extent his collaborative behaviors were typical of scholars in general.*

There is little doubt that physical proximity is important in enabling researchers to meet, to easily identify areas of common interest, and to share information more readily as studies across fields such as economics (Porter, 1990; Saxenian, 1994), R&D management (Allen, 1977; Katz, 1994), and communications (Kraut, Rice, Cool, & Fish, 1998; Rice & Aydin, 1991) have shown. Scholars who study academic collaboration have examined how co-author choice is shaped by location—which they usually define as being in the same university—and there is overwhelming support that the vast majority of co-authored work is published by co-located authors (Nagpaul, 2003; Welsh & Bremser, 2005). While some claim that contemporary communication technologies such as Internet file-sharing (Kraut et al., 1990) and Skype have meant that location is no longer a constraint (Hammermesh & Oster, 2002), others argue that location continues to significantly constrain human interactions (Kock, 2004). The media naturalness theory (Kock, 2004) posits that human beings have genetically driven natural schema that determine tendencies and comfort levels with electronic media, audio, or face-to-face and that these levels determine the extent to which they excel in specific media contexts. Kock further contends that a mismatch between individuals' natural schemas results in a high degree of perceived cognitive effort in their interactions, which suggests that, even though online interactions are much more common today, collaborations among co-located individuals are much more likely to occur than those among non co-located researchers.

In view of Cronin and Shaw's (2007) eloquent testimony to Rob Kling's deep attachments to his colleagues at the institutions where he was based, we already know that scholars have a greater likelihood of co-authoring with others who are co-located in the same university. Such an effect has been demonstrated in studies of information sharing (Cross, Rice & Parker, 2001b) and academic co-authorship (Welsh & Bremser, 2005). Based on the proven importance of location in scholars' choice of co-authors, we believe that attending the same PhD program constitutes one form of social

[7] Another way to interpret the same results would be that that Rob Kling deliberately chose the institutions where he wanted to work based on future collaborators (an alternate view that Cronin and Shaw (2007) do not consider).

network that predisposes its members to choose each other as co-authors. Of course, this is just one easily measured indicator of co-location. Other types of co-location (e.g., working at the same institution at a given point in time, such as visiting scholars) are more difficult to track but are likely to reinforce the same effect that we seek to measure here[8]. Thus, we posit:

H4: *IS researchers are more likely to co-author with another member who attended the same PhD program compared to other, random members from the population of IS researchers.*

3.4. Scholarly Influence of Collaboration Patterns

Whereas H1-4 examines antecedents to co-authoring, H5 examines a critical consequence of co-authorship: scholarly influence as indicated by citation rates. The relationship between collaboration and scholarly influence is grounded in the notion that researchers' social capital is leveraged in collaborative activities that may help scholars create knowledge and help advance their field. Many studies have posited that co-authored papers receive more citations than solo papers or that studies with *more* co-authors receive more citations than papers with fewer authors. Over a dozen studies have examined the relationship between co-authorship and the number of subsequent citations reported: in management (Bayer & Smart, 1991), astronomy (Abt, 1984), economics (Laband & Piette, 1995), ecology (Leimu & Koricheva, 2005), physics (Beaver, 1986), finance (Chung, Cox, & Kim, 2009), mathematics, chemistry, and biomedicine (Glanzel, 2002), across a range of different sciences (Glänzel & Schubert, 2004), and, specifically, in the "hard sciences" (Lindsey, 1978). Of these studies, some found no relationship between co-authorship and citations (such as one in finance (Avkiran, 1997). One economics study even reported an inverse relationship such that co-authored economics papers received fewer citations (Piette & Ross, 1992a).

It may also be that, in some fields, having more co-authors does indeed lead to results or insights of greater value, which then accrue more citations over time. This higher level of citations occurs for two reasons: first, having more authors integrates more skills and a broader range of perspectives. Second, having more co-authors allows more individuals to identify weaknesses or errors in a study before it is submitted for review. If, indeed, the quality of co-authored work is higher than that of a solo authored paper, then co-authored papers should generate more citations; they should also have a greater likelihood of being accepted in the first place (Brown, 2005). If these explanations for the value provided by having more co-authors are correct, then we would expect such effects to be universal. That would make it difficult to explain why the positive effect of having more co-authors on citations should be present in some fields but not others (Piette & Ross, 1992a).

Perhaps one reason for the contradictory results of the effect of coauthorship on citations is that some studies consider just the *incidence* of co-authorship (whether a paper is co-authored or not) but fail to consider *the extent* of co-authorship (i.e., the actual number of authors). Many of the studies cited above treat co-authorship as a dichotomous variable with each paper simply classified as solo-authored or co-authored. The problem is that, if a curvilinear relationship exists between the number of authors and citations[9], then such a dichotomous treatment of co-authorship will obscure the effect. Indeed, Acedo et al. (2006) found a curvilinear relationship in their analysis of ten management journals: papers with two authors were cited significantly more than papers with one author; however, papers with two authors were also better-cited than papers with three or more authors. Likewise, Chung et al. (2009) show that finance papers with exactly four authors received the most citations—significantly more than papers with one to three authors. Hence, it is better to consider the extent of co-authorship (i.e., the actual number of authors) rather than analyzing the incidence of co-authorship, which treats all coauthored papers alike. Moreover, any such analysis should allow for curvilinear effects in addition to linear effects between number of authors and citations. Thus, we posit:

H5: *Papers with more co-authors will receive more citations than solo-authored papers.*

[8] We thank an anonymous reviewer for the insight that other types of co-location exist but are harder to measure.

[9] For example, papers with two or three authors may be more heavily cited than solo papers but papers with four or more authors may not. Analyzing just the incidence of co-authorship would fail to detect any relationship.

4. Research Method

We analyzed papers published in five leading IS journals. For the first two hypotheses, we analyzed data going back to 1985 (or the year that each journal was founded). For the remaining hypotheses (H3-H5), we analyzed papers published during a seven-year period from 1999 to 2005[10] . Table 2 shows the journals, their first year of publication, and the number of volumes that we analyzed for each hypothesis. We chose these journals because they are widely considered to be the leading journals that primarily publish IS research. Along with *Journal of the Association for Information Systems*[11], these journals form the AIS Senior Scholars' "basket of six" leading IS journals. While there are some other high-quality journals that publish *some* IS research (e.g., *Management Science* and *Organization Science*), the latter journals do not primarily publish IS research; hence, we limited our review to these five journals from the AIS Senior Scholars' "basket of six".

These are the same journals that other scientometric studies published in recent years (Clark & Warren, 2006; Zhang & Li, 2005) included, although we include more European journals than in prior scientometric studies. We used the bibliographic repository of IS research (Chua et al., 2002a, Chua, Cao, Cousins, & Straub, 2002b), which several studies of IS publications have used and cited (Dennis et al., 2006; Lowry et al., 2004; Willcocks, Whitley, & Avgerou, 2008). We validated the data in the repository to ensure its completeness and accuracy during the years in question. If necessary, we added data to the repository corresponding to any issues or papers omitted when it was created.

Table 2. Scholarly IS Journals Examined

Journal	Year founded	Years analyzed (H1-H2)	No. of volumes analyzed (H1-H2)	Years analyzed (H3-H5)	No. of volumes analyzed (H3-H5)
European Journal of IS Information Systems	1991	1991-2005	14	1999-2005	7
Information Systems Journal	1991	1991-2005	15	1999-2005	7
Information Systems Research	1990	1990-2005	16	1999-2005	7
Journal of MIS	1984	1985-2005	21	1999-2005	7
MIS Quarterly	1977	1985-2005	21	1999-2005	7

We classified each paper as being solo- or co-authored and noted their exact number of authors. We created trend lines for each journal starting with 1985 (or the first year each journal was published) until 2005. To analyze H1a and H1b, we regressed the dependent variable (i.e., the ratio of co-authored papers or the mean number of authors per year, respectively) on the year of publication to determine whether the dependent variable was related to time in a linear or curvilinear fashion.

To analyze H2, we compared the trend lines for three North American journals (*Journal of MIS*, *MISQ*, and *ISR*) to the two European journals (*EJIS* and *ISJ*) by using repeated ANOVA. In this analysis, we treat the independent variable as the continent where each journal is published and the dependent variables as the incidence of co-authorship (H2a) or the extent of co-authorship (H2b).

To test H3 and H4, we focused only on co-authored papers (and, thus, ignored solo-authored papers). Here, our unit of analysis is the co-author dyad rather than journal papers. To determine the influence of sex (H3) and PhD program affiliation (H4) on the choice of co-authors, we created an *edge list*, a standard practice in social networks research (Eaton et al., 1999; Faloutsos, McCurley, & Tomkins,

[10] This dataset is admittedly somewhat dated. The main reason for this is that our paper has been in the pipeline for several years due to long delays at our end. We take full responsibility for this.

[11] We omitted *JAIS* because Thomson/ISI did not report citation data for JAIS until July 2009 and, then, only for papers published in 2006 and 2007. *JAIS* also published few papers per year before 2003 (i.e., 2000-2002).

2004; Kolacyzk, 2009; Smith, 2006; Thomas, 2009). In an asymmetric edge list, six co-author dyads represent a paper with four authors (e.g., Ames, Bates, Carter, and Dalton) as follows:

Ames, Bates	Ames, Carter	Ames, Dalton
Bates, Carter	Bates, Dalton	Carter, Dalton

Thus, the number of rows in the asymmetric edge list is: n x (n-1) / 2, where n is the number of authors for a given paper. In most cases, each co-author dyad we identified represents a researcher pair who co-authored a single paper; however, we identified and tracked any special cases where a given co-author dyad had published two or more papers. There were dozens of dyads with two or three papers in these journals during the years 1999 to 2005. We identified two co-author dyads with exactly five papers (Sarv Devaraj and Rajiv Kohli; and Zahir Irani and Peter Love) in these journals, plus another co-author dyad with exactly four papers (K.K. Wei and Bernard Tan).

In cleansing the data prior to analysis, we omitted editor's comments, guest editors' Introductions, and other genres of short papers (e.g., book reviews, editors' introductions to special issues, and errata notes (corrections to prior papers). In journals that feature a large number of book reviews and opinion pieces (*European Journal of IS*) or short editorials from guest editors (e.g., *Journal of MIS*), the ratio of papers we excluded was over 10 percent of all papers. Other researchers explain the details about screening non-research papers (e.g., Gallivan & Benbunan-Fich, 2007, p. 41).

To test H3, we coded each author's sex using a process that comprised up to three steps: 1) based on our familiarity with specific authors, 2) based on authors' biographical statements accompanying their published papers, and 3) using Google searches to locate the authors' websites. If these steps did not yield a definite classification of sex, we omitted the code for that author (which occurred in less than 0.5 percent of papers). We computed the ratio of "matches" as a fraction of all sex-coded dyads in the asymmetric edge list. Since the notion of co-authors "matching" or "not matching" is a dichotomous variable, we conducted Chi-squared tests to evaluate whether gender sorting (McDowell & Smith, 1992) occurred. We analyzed each journal separately using one-tailed tests of significance before analyzing all the journals together. Because we performed separate tests for the five journals, we included the standard Bonferroni correction to allow for the higher probability of a type 2 error.

Likewise, to test H4, we also coded the name of the university where each author attended a PhD program based on a multi-step process similar to that described above for sex. We also used the AIS Faculty Directory as a resource[12]. In a few cases, we identified authors who did not attend a PhD program: usually, practitioners who were co-authors because they provided access to a field study site. We coded them as having no PhD program affiliation. For authors who were listed as students in a masters or undergraduate program, we coded them as being affiliated with the university shown in their biographical data. As with H3, we identified the number and ratio PhD program "matches" and "non matches" and then performed similar Chi-squared tests for each journal and for the total dataset.

To test the effect of number of authors on citations (H5), we treated the number of co-authors as the independent variable and citation rate as the dependent variable (i.e., number of citations divided by elapsed time that the paper had been in print to the nearest quarter year). To allow for the possibility of a curvilinear relationship between number of authors and citations, we also included a quadratic term (i.e., number of authors squared) and higher-order terms given prior work showing that citations are related to number of authors in a curvilinear manner (Acedo et al., 2006; Chung et al., 2009). Since citation data follow a Poisson distribution (Bornmann, Mutz, Neuhaus, & Daniel, 2008; Gardner, Mulvey, & Shaw, 1995), we used Poisson regression (available through PROC GLM in SAS) rather than standard OLS regression. We collected citation data from ISI/Thomson's Web of Science citation database, which tracks citations in both the Science Citation Index and Social Science Citation Index. We collected all citation data in early 2011.

[12] For details of the AIS Faculty Directory, see https://aisnet.org/?FacultyDirectory.

As evidence of the fact that the data are distributed in a Poisson manner, we show the mean and standard deviation of the citation rate for each journal. We also identified some "outlier" data (i.e., where the citation rate was more than two standard deviations above the mean), and we repeated our analyses after excluding such outlier data[13]. We identified fewer than ten papers per journal as outliers during the seven-year period 1999 to 2005; thus, we designated just 3-4 percent of papers in each journal as outliers based on our definition. Table 3 and the appendix specify these outliers.

Table 3. Information about Citations per Year and Outliers

Journal	Mean citation rate	Standard deviation of citation rate	Outliers defined as papers with citation rate	Number of outlier papers
European Journal of IS	1.43	1.18	> 3.8 / year	9
Information Systems Journal	1.67	1.64	> 4.9 / year	8
Information Systems Research	3.82	4.13	> 12.1 / year	9
Journal of MIS	2.36	3.16	> 8.7 / year	9
MIS Quarterly	7.10	7.20	> 21.5 / year	6

5. Results

In discussing the findings for each hypothesis, we first summarize results for a consolidated analysis of all journals together, and then the results for each individual journal. In analyzing the effect of time (i.e., publication year) on incidence of co-authorship (H1a) and extent of co-authorship (H1b), we found a statistically significant result for the consolidated analysis. The relationship between year of publication and incidence of co-authorship was curvilinear: it showed rapid growth from 1985 until 2000 and then levelled off thereafter. The effect of time (i.e., publication year) and time-squared were statistically significant. In contrast, the relationship between year and extent of co-authorship was linear with a significant effect for time but not time-squared. We interpret this to reflect an ongoing increase in the mean number of authors over time, with no indication of this trend "leveling off" as of 2005. Since the effect of time was significant for both outcome variables, then both hypotheses H1a (incidence of co-authorship) and H1b (extent of co-authorship) are supported.

Given that one can derive important insights from analyzing differences among various journals (Vessey, Ramesh, & Glass, 2002), we conducted separate analysis for each journal to determine if the overall pattern was shared across all journals. With regard to incidence of co-authorship (H1a), three journals (*ISJ*, *JMIS*, and *MISQ*) showed a significant increase in the ratio of co-authored papers over time; however, there was no consistent pattern for *EJIS* or *ISR* (Table 4). For two of the journals in which the rise in co-authorship was significant (*JMIS* and *MISQ)*, time-squared was also significant, which indicates that the increase in the ratio of co-authored papers had begun to level off by 2005. For the third journal (*ISJ*), there was just a linear effect of time on co-authorship, which reflects a steady increase in the incidence of coauthorship with no sign of slowing[14].

One way to interpret the practical significance of these results is to compare the R^2 values for each trendline to effect size norms where the values of 0.02, 0.13, and 0.35 are defined as small, medium, and large, respectively (Cohen et al. 2002). Based on these norms, the amount of variance explained

[13] We repeated our analyses with and without the outliers. The appendix shows some papers with ten times the mean citation rate for the journal in which they were published. This included the paper introducing the unified theory of acceptance and use of technology in *MIS Quarterly* (Venkatesh, Davis, Morris & Davis, 2000) and a ten-year update to the well-known "IS Success Model" (DeLone & McLean, 2003) in *Journal of MIS*.

[14] *EJIS* exhibited a significant effect for time but only if quadratic and cubic terms (year-cubed) were included. The incidence of co-authorship exhibited a wave-like pattern for *EJIS* (i.e., declining, increasing, then declining again).

was large for *JMIS* and *MISQ* (R^2 = 0.48 and 0.55), medium-large for *ISJ* (R^2 = 0.23), and small for *EJIS* (R^2 = 0.05). H1a was supported for three journals (*ISJ, JMIS*, *MISQ*), but not for *EJIS* or *ISR*.

In analyzing changes in the extent of co-authorship (H1b), we found that time was statistically significant for the consolidated analysis (p<.01) and in the separate analyses for all journals except *MISQ* (Table 5). For three of the journals where the extent of co-authorship was related to time, there was no effect for time-squared, which indicates that the growth in number of co-authors over time showed no sign of leveling off by 2005. For *EJIS*, there was an effect of time on the number of co-authors, but the effect was more complex: there was a wave-like pattern with the average number of co-authors increasing from 1991-1994, declining from 1995-2001, then increasing again. Relative to the defined norms for effect sizes (Cohen, et al. (2002) and *JMIS* exhibited large effect sizes (R^2 = 0.30 and 0.41, respectively), while *ISR* and *EJIS* exhibited small effect sizes (R^2 = .028 for both).

Table 4. Changes in the Incidence of Co-authorship Over Time

Journal	Years analyzed; # volumes	Slope of trend line (year as predictor)	Total R^2 (variance explained)	Pearson's correlation *r*	Average of first 5-year interval	Average of middle interval	Average of last 5-year interval
All journals combined	1985-2005	b = +1.77 p< .001 Squared term is significant	0.524 p< .001	0.755 p< .001	49.5%	72.5%	77.1%
EJIS	1991-2005 14	b = +.405 Squared term significant p<.01	0.045 not signif.	0.076 not signif.	73.6%	68.8%	70.8%
ISJ	1991-2005 15	b = +1.72 p< .05 Squared term not significant	0.228 p< .05	0.477 p< .05	53.4%	72.9%	71.8%
ISR	1990-2005 16	b = +.0154 p< .05	0.000 not signif.	0.030 not signif.	88.3%	76.8%	76.3%
JMIS	1985-2005 21	b = +2.27 p< .000 Squared term p< .01	0.476 p< .001	0.668 p< .001	39.0%	73.6%	77.7%
MISQ	1985-2005 21	b = +2.04 p< .01 Squared term p< .01	0.552 p< .001	0.708 p< .001	56.3%	76.7%	71.3%

In order to test H2a and H2b (i.e., to determine whether there were differences in co-authorship based on the continent where each journal is published), we conducted a repeated measures ANOVA with continent as the predictor and incidence of co-authorship (H2a) or extent of co-authorship (H2b) as the dependent variable. Since the two European journals (*EJIS* and *ISJ*) did not begin publishing until 1991, this analysis compares data for 1991-2005 only. Our results show differences based on continent of publication (p<.001) with North American journals having both a higher incidence of co-authorship (H2a) and higher extent of co-authorship (H2b) compared to European journals. The typical gap in terms of the incidence of co-authorship was a constant 15 percent each year between

journals published in the two regions. Thus, in a given year, if the incidence of co-authorship was 50 percent for the European journals, then it was 65 percent for the North American journals on average. The size of the gap for extent of co-authorship was consistent but larger: the mean number of co-authors was 30 percent higher in the North American journals than in European journals. Both H2a and H2b were strongly supported.

Table 5. Changes in the Extent of Co-authorship Over Time

Journal	Years analyzed # volumes	Slope of trend line (year as predictor)	Total R^2 (variance explained)	Pearson's correlation *r*	Average of first 5-year interval	Average of middle interval	Average of last 5-year Interval
All journals combined	1985-2005	b = +.017 p< .01		0.518 p< .01	2.26	2.29	2.54
EJIS	1991-2005 14	b = +.208 p< .05 Squared and cubic terms *significant* p< .05	0.028 p<.05 (small)	0.102 not signif.	2.08	1.87	2.24
ISJ	1991-2005 15	b = +.044 p< .05 Squared term *not significant*	.303 (large)	0.550 p< .05	1.77	2.00	2.15
ISR	1990-2005 16	b = -.004 p<.01 Squared term *not significant*	0.028 small	0.170 p< .01	2.83	2.77	2.93
JMIS	1985-2005 22	b = +.0411 p< .01 Squared term *not significant*	0.406 (large)	0.637 p< .01	1.94	2.54	2.63
MISQ	1985-2005 21	b = -.029 *not significant*	0.004 not signif.	-.063 not signif.	2.78	2.63	2.68

H3 posits a pattern of homophily or gender sorting in terms of researchers' choice of co-authors. After performing the Chi-squared test of association to see if a male author was more likely to be paired with another male author, we found significant results for the consolidated analysis of all five journals (Chi-squared = 27.52, p<.0001), which means that the choice of co-authors was not random but instead based on homophily based on sex. Of all co-author dyads in the edge list, 67.2 percent were male (same sex), 4.3% were female (same sex), and 28.5 percent were opposite sex dyads. As Table 6 shows, when we performed separate analyses for each journal (and including the Bonferroni adjustment), just two journals exhibited a significant result: *EJIS* (Chi-square = 12.87, p< .005) and *ISJ* (Chi-square = 10.97, p< .01). A similar but weaker effect was present for *ISR* before we made the Bonferroni adjustment (Chi-squared = 4.74, p< .10) but not after the correction (p<.234). There was no effect of authors' sex on co-author choice for *MISQ* and *JMIS*.

Thus, just two journals (*EJIS* and *ISJ*) exhibited a significant effect for gender sorting despite the statistically significant result for the combined analysis of all journals (p<.0001). When analyzing each journal separately, small deviations from the null hypothesis of "no association" between researchers' choice of co-authors can have a large effect on the results. For instance, the number of female same-

sex dyads was much larger in the two European journals than would have occurred by chance: there were 48 percent more female dyads in *EJIS* than expected if the null hypothesis were correct (47 observed vs. 31.8 expected) and 79 percent more female dyads in *ISJ* than expected (20 observed vs. 11.2 expected). Conversely, there were 16 percent fewer opposite-sex dyads in *EJIS* than we expect if the null hypothesis were correct and 20 percent fewer opposite-sex dyads in *ISJ*. H3 was supported for the consolidated analysis of journals and for the two European journals (*EJIS* and *ISJ*).

Table 6. Summary of Chi-square Results for Gender Homophily

Journal	Chi-square value	p-value One-tailed test	After Bonferroni correction p-value	Interpretation of Chi-square effect sizes
Combined analysis	27.52	p<. 00001	not applicable	Between small and medium
EJIS	12.873	p<. 0008	p< .004	Medium
ISJ	10.970	p<. 0020	p< .010	Medium
ISR	4.741	p<. 0467	p< .234	Between small and medium
JMIS	2.048	p<. 1796	p< .897	*not significant*
MISQ	0.339	p<. 4220	p< .940	*not significant*

Next, we tested H4 to determine if PhD program affiliation affected researchers' choice of co-authors. Overall, we found that 14.3 percent of co-authors received their PhD training in the same institutions. Since this pattern differs from a random pattern of co-author selection (based on co-authors from more than 275 different institutions), H4 was clearly supported.

We also examined the lists of same PhD program co-authors to gain insights into the patterns of co-authorship. While our initial hypothesis was based on the assumption that many co-authors met when they attended the same PhD program at the same time, we found several examples that confirmed this pattern but also found others that diverged from it. Overall, there were four concrete patterns of co-authorship based on institutional affiliation Most obviously, several co-author dyads were PhD students in the same program at the same time[15]. However, we found three other interesting patterns of same-PhD program co-authors who met many years *after* one or both members of the dyad had completed their PhD degree, which we describe in the paragraphs below.

First, there were examples of co-authors who attended the same PhD program but as much as one decade, two decades (e.g., John King and John Tillquist, both from University of California, Irvine), or even three decades apart (e.g., Andrew Whinston and Anitesh Barua, both from Carnegie Mellon). Such gaps in terms of the year when each member completed the PhD program suggest that the pair of authors did not meet and begin to collaborate during their PhD program but instead later when they were hired as faculty members at another university. This reflects the fact that some departments consistently hire faculty from the same PhD programs over time (e.g., University of Texas hired both Whinston and Barua after they graduated from Carnegie Mellon). Many leading IS departments repeatedly hire faculty from the same PhD programs. For instance, New York University hired many faculty members receiving PhDs from MIT; University of Minnesota hired many faculty receiving PhDs from Indiana University. The reverse is also true in that MIT hired many faculty receiving PhDs from NYU and Indiana University hired many faculty who received PhDs from University of Minnesota. This pattern of universities repeatedly hiring faculty who received their PhDs from a given program leads to the observed result that many co-author dyads were affiliated with the same PhD programs and were subsequently employed at the same institution; however, their collaboration often began many years *after* one or both members received their PhD degrees. In some cases, the two collaborated as

[15] Some examples include Soon Ang and Sandra Slaughter from University of Minnesota, Sue Brown and Viswanath Venkatesh also from University of Minnesota, and Mark Keil and Jeff Smith from Harvard Business School.

a dyad; in other cases, they collaborated with a third author—usually a PhD candidate whom the other authors jointly supervised[16].

Another pattern we found was in universities who hired their own PhD graduates as faculty who then supervised and co-authored later on with their own PhD students in the program. We found some illustrative examples at MIT (e.g., Erik Brynjolfsson with Lorin Hitt or Stu Madnick with Rich Wang), at Boston University (Stephanie Watts Sussman with Wendy Siegal), and at the National University of Singapore (Bernard Tan with Atreyi Kankanhalli). A final pattern we observed was several PhD students from the same university co-authoring a paper but where the set of co-authors also included a senior faculty member at the same university: one who directed the research study with multiple PhD students. In this scenario, the PhD students were attending the PhD program concurrently (although the senior faculty member did not receive his PhD degree from the same university). We found many such papers that resulted from projects with PhD students led by Dennis Galletta of University of Pittsburgh (Galletta, Henry, McCoy, & Polak, 2006), Varun Grover of University of South Carolina (e.g., Im, Dow, & Grover, 2001), and Jay Nunamaker of University of Arizona. Based on our personal knowledge of the authors, we know that some of these papers evolved from PhD class projects (e.g., Boudreau, Gefen, & Straub, 2001; Galletta et al., 2006).

Thus, in summarizing the various co-author scenarios involving same PhD program co-authors, we note that IS researchers have often co-authored with other persons who received their PhD degrees from the same program; however, this does not necessarily mean that the co-authors attended the PhD program at the same time. While the co-authors did not necessarily attend the same PhD program concurrently, this still reflects the notion of homophily (Ibarra, 1992), which is that people associate with others who are similar to them in some way. In the context of co-authorship, this relationship reflects the effect of one or more of the following homophily mechanisms: identification with the PhD institution, a shared focus of the research area due to the PhD program research emphasis, or shared social networks. Overall, the fact that 14.3 percent of co-authors had attended the same PhD program (a rate much higher than we would have expected by chance), co-authorship was related to having attended the same PhD program. Thus, H4 was supported.

Finally, we tested whether a paper's citation rate was related to the number of co-authors (H5). We performed Poisson regression using SAS with citation rate as the dependent variable and number of authors as the independent variable. We included optional quadratic and higher-order terms for the number of authors to allow for curvilinear relationships between the number of authors and citations. We analyzed each journal separately, but we did not conduct a consolidated analysis because a consolidated analysis would mean that some papers lack independence from others[17]. Moreover, in journals that publish different types of papers (such as regular papers, research notes, reviews, and research essays or commentaries), we used dummy codes to control for various paper genres since we considered (and confirmed) the possibility that the paper genre was related to citation rates[18].

Our analyses revealed a positive effect of number of authors on citation rate for three journals: *EJIS*, *JMIS*, and *MISQ*. We found no effect for *ISJ*. Moreover, the relationship was significant but negative for *ISR* – directly contradicting our hypothesis. In analyzing H5, we included higher-order terms for number of authors (e.g., authors-squared and authors-cubed) to allow for the possibility of non-linear effects. Indeed, we identified significant higher-order effects for *EJIS*, *JMIS*, and *MISQ*. After including such higher-order terms, we found that the relationship between number of authors and citation rate exhibited the anticipated effects for *EJIS*, *JMIS,* and *MISQ*: the citation rate first rose as the number of authors increased and then levelled off or declined for papers with four or more authors.

[16] Some examples of two faculty members who previously received PhDs from the same PhD program and were later hired at the same university where they supervised a PhD student include Norm Chervany and Detmar Straub (both PhDs from Indiana Univ.) who supervised Elena Karahanna (Karahanna, Straub, & Chervany, 1999) and Anitesh Barua and Andy Whinston (PhDs from CMU) who supervised Anjana Susarla (Susarla, Barua, & Whinston, 2003).

[17] A requirement for regression analysis (even Poisson regression) is that each unit be independent of all others, but a consolidated analysis would violate this assumption since individual papers share common features if they are "nested" in the same journals.

[18] We added these codes for *ISR* (which has 3 paper types) and *MISQ* (which has five paper types). As we describe above, we excluded all non-research papers (editor comments, guest editorials, book reviews, and opinions pieces).

Table 7. Analysis of Number of Co-authors and Citation Rates

Journal	Total R^2 and R^2_{adj} with year as a covariate	Total R^2_{adj} and change in R^2 after adding number of authors	# of authors regression coefficient (linear)	# of authors regression coefficient (higher order)	Effect size calculation and interpretation
EJIS	.029 / .022	.050 / .041	a = 0.179 (p<.01)	ns	2.64% (small effect)
ISJ	.003 / .000	.003 / .000	ns	ns	No effect
ISR	.019 / .019	.034 / .027	-0.536 (p<.01)	ns	1.70% (small effect)
JMIS	.058 /.054	.073 / .064	ns	a = 1.65 a^2 = -0.320 (p< .01)	5.83% (medium-small effect)
MISQ	.013 / .008	.061 / .060	a = 1.40 (p<.05)	a = 1.85 a^2 = 0.06 (p< .01)	4.61% (medium-small effect)

Overall, H5 received mixed support: three of the journals exhibited a significant effect for number of authors in the expected direction, while one journal (*ISR*) exhibited a contrary result. In addition to discussing statistical significance, we also calculated effect sizes by using the formula for Cohen's f^2, which considers explained variance after controlling for covariates (such as year of publication)[19]. For *EJIS* and *JMIS*, the effect size was small (about 2 percent), but *JMIS* and *MISQ* had effect sizes twice as large (5.8 percent and 4.6 percent, respectively), which we consider to be "medium-small" effects (Cohen, et al 2002). For *ISR*, the effect size was small but opposite in direction to what we predicted.

Table 8. Increase in Citation Rate for Each Additional Author

Name	Mean Citation rate (citations/yr)				Citation rate Δ compared to solo-authored paper			Citation rate Δ compared to 2 authors	
	1 author	2 authors	3 authors	4 authors	Compare 2:1 authors	Compare 3:1 authors	Compare 4:1 authors	Compare 3:2 authors	Compare 4:2 authors
EJIS	3.33	3.51	3.69	3.86	5.4%	10.8%	15.9%	5.1%	10.0%
MISQ	7.40	5.65	7.76	10.25	-23.6%	4.9%	38.5%	37.3%	81.4%
JMIS	1.62	2.04	2.55	1.25	25.9%	57.4%	-7.0%	25.1%	-38.7%
ISR	5.02	4.49	3.95	3.41	-10.7	-21.4%	-32.1%	-12.0%	-24.0%

To convey the practical significance of these results, we show how many extra citations a paper in each journal would receive, on average, if there were two, three, or four authors compared to a solo-authored paper in the same journal (Table 8). On the left side, Table 8 shows the mean citation rate for papers ranging from one to four authors. Due to curvilinear effects, the highest citation rates were for a paper with four authors in *EJIS* and *MISQ*, a paper with three authors in *JMIS*, and a solo paper in *ISR*. On the right side of Table 8, we can see the average percent increase in citation rates for papers with additional authors. For example, the last column shows that, comparing a paper with four authors to another with two authors, there is a change of 10 percent, 81.4 percent, -38.7 percent and -24.0 percent higher (or lower) citation rate for the journals *EJIS*, *MISQ*, *JMIS*, and *ISR*, respectively[20].

[19] See Wikipedia definition of Cohen's f^2 at http://en.wikipedia.org/wiki/Effect_size#Cohen.27s_.C6.922

[20] The results described above represent average results for the years 1999-2005.

In summary, we found support for the hypothesis related to co-authorship in IS research. Table 9 summarizes our hypotheses and their corresponding findings.

Table 9. Summary of Results of Hypothesis-Testing

	Dependent variable	Predictor variable	Consolidated analysis	Separate analyses	Supported for specific journals	Not supported for journals
H1a	Incidence of co-authorship	Time (Year)	Supported	Mixed results	*MISQ, ISJ, JMIS*	*EJIS, ISR*
H1b	Extent of co-authorship	Time (Year)	Supported	Most supported	*ISR, ISJ, JMIS, EJIS*	*MISQ*
H2a	Incidence of co-authorship	Continent of publication	Supported	n/a	n/a	n/a
H2b	Extent of co-authorship	Continent of publication	Supported	n/a	n/a	n/a
H3	Choice of co-authors	Sex	Supported	Mixed results	*EJIS, ISJ*	*MISQ, ISR, JMIS*
H4	Choice of co-authors	PhD program	Supported	All journals	*MISQ, EJIS, ISJ, ISR, JMIS*	n/a
H5	Citation rate	Extent of co-authorship	Supported	Most supported	*MISQ, EJIS, JMIS*	*ISJ, ISR*

6. Discussion

We regard our study as offering several insights into the identity of the IS field in line with DeSanctis' (2003) view of the social life of IS research. Using a network view, we examined the antecedents of co-authorship at the individual and institutional levels and examined scholarly influence of co-authorship patters. We show that, overall, co-authorship has increased over time; sex and institutional homphily shape researchers' actual choice of co-authors in IS research; and the number of co-authors may be associated with scholarly influence as indicated by citation rates. By adopting a community of practice view of the IS field's identity, we contribute to the body of work in the IS literature that uses a "scientometric" approach—what Straub (2006, p. 241) labels as "work that deals with fundamental questions of how scientific disciplines evolve".

First, our study shows that co-authorship is on an increase: co-authored papers represented over 80 percent of papers published in three leading North American journals as of 2005 and over 70 percent of papers published in two leading European journals. Conversely, the fraction of solo papers averaged less than 20 percent in the North American journals over the past decade and failed to achieve even 10 percent in some years (e.g., *ISR* in 2003 and *JMIS* in 2005). It seems that not only is co-authoring the norm in IS journals today but also that the incidence of co-authorship has risen 125 percent in North American journals over a 20-year period (growing from 36%, on average, in 1985 to 81% in 2005). Although our study emerges 50 years after Price's (1963) dramatic statement regarding the impact of co-authorship, it supports his claim that co-authoring is "one of the most violent transitions...in recent trends of scientific manpower and literature" (Price, 1963, p. 89).

While the sharp increase in the incidence of co-authoring appears to have started levelling off in North American IS journals by 2005, it is important to consider why the level of co-authorship has increased so much in recent decades. IS researchers appear to rarely produce solo-authored papers today, especially in North American journals where less than 15 percent of papers were solo-authored in the mid-2000s. What might account for the paucity of solo-authored papers in North American IS journals? Do IS scholars no longer work alone, or do they experience obstacles publishing solo-authored papers and, hence, they add new co-authors during the writing and review stages? While these intriguing questions follow from the data, we are unable to answer them because our study is limited to papers that *are* published in journals. Our study ignores papers that are only published as working papers but then rejected from leading journals. Of course, in our literature review, we identify

a range of benefits often attributed to co-authoring; namely, a broader range of skills and perspectives being brought to bear on a project, as well as more specialization of talent and division of labor among team members. While the observed growth in the incidence and extent of co-authorship is consistent with such a rationale for co-authoring, we cannot prove that these are the true drivers of increased co-authorship.

The economics and psychology literatures have proposed an alternative, more cynical explanation for the underlying drivers behind co-authorship's rising rate. While we did not directly test it in our study, this perspective suggests that the actual amount of actual research collaboration has not increased but rather that just the number of authors whose names appear on published papers is what has changed over time. This change, in turn, is due to the fact that colleagues or mentors who provide informal comments on manuscripts and who – a decade ago – would have received acknowledgement for their efforts now expect to be listed as a co-author. This expectation is shown in economist Barnett's (Barnett et al. 1988, p. 539) claim that, due to the rapidly increasing "opportunity cost of time", colleagues who take the time to read and offer constructive insights on a paper now expect to receive authorship for their effort. Academic psychologists also raised the same explanation three decades ago (Sacco & Milana, 1984, p. 81):

> *Pressures to "publish or perish" are most often cited as reasons for increases in authors per paper…. Because of an apparent necessity for a lengthy vita, researchers may be relaxing authorship standards both for themselves and for others. Thus, [colleagues] who provide only minimal contributions, which in the past have been acknowledged by a footnote…, now expect to be granted authorship.*

In biomedicine, a set of Greek scholars (Papatheodorou, Trikalinos, & Ioannidis, 2008) analyzed the correlation between the number of co-authors on papers with the complexity of the research. In a paper titled "Inflated Numbers of Authors Over Time Have Not Been Just Due to Increasing Research Complexity", they conclude that, consistent with the previous cynics in psychology (Sacco & Milana, 1984) and in economics (Barnett, Ault, & Kaserman, 1988), increasing rates of co-authorship appear to be largely a function of colleagues who would previously have received just an acknowledgment now being listed authors:

> *No previous study had been able to dissect whether the increase in the number of authors is simply due to an increasing complexity of research or whether authorship has become more coveted over time…. Our analysis suggests that the increased number of authors over time has not been just an issue of increasing complexity of research. The increased clustering of names into mastheads has been occurring, in particular, for … [journals]… considered prestigious, as suggested by their impact factor. Apparently, many more authors [are] ... trying to fit into high-impact papers that count for grants, promotion, and scientific prestige in general. If this is true and the trend continues, with more authors co-authoring more papers, authorship will gradually become an academic coinage suffering from grave inflation.* (Papatheodorou et al., 2008, p. 551)

While this cynical perspective differs greatly from the traditional explanation that researchers collaborate to achieve greater synergy of ideas, we believe it deserves consideration, especially in view of how *rarely* it is mentioned in any business field with the exception of economics (Barnett et al., 1988). Of the scores of papers that we reviewed about co-authorship and "scientific collaboration", nearly all assumed that research collaboration and co-authorship are equivalent terms. In contrast, the cynical view reflected in the quotes above claims that collaboration and co-authorship can be distinct. Historically, many colleagues and/or assistants may have collaborated with a lead researcher on a project without expecting a co-authorship listing. Nowadays, such contributors expect to be included as authors on a publication, which stems from the "opportunity cost of time" (Barnett et al., 1988). In other cases, colleagues may provide strong leadership on a project and yet not be listed as a co-author (Allen et al., 2011). While our current data do not directly address this issue, it would be interesting to consider what proportion of IS PhD dissertations now feature the dissertation advisor(s) as co-authors on published papers in comparison to one or two decades ago. It may be that such a

shift in community norms may be one factor that is driving the increase in co-authorship over the past two decades. Such changes in norms could also be examined in terms of the proportion of co-authored papers produced by peer collaborators (i.e., researchers with similar professional ranks) compared to the proportion generated by "supervisory co-authorship" that comprise advisor-student or other mentor-protégé relationships (Gallivan, 2010). While it would be time-consuming to conduct such analyses on completed dissertations vs. papers published in leading journals, it may provide evidence of changing community norms regarding the prevalence of "supervisory co-authorship".

Our result showing significant differences in the incidence and extent of co-authorship based on the continent where a journal is published may also figure in this debate. Our initial rationale for positing H2 was that North American journals have higher rates of co-authorship because these journals publish more quantitative research, which has been shown to have more co-authors than qualitative research in other fields (Moody, 2004). While our H2 was indeed supported, it may not be due to the fact that North American IS journals publish more quantitative research but rather due to the fact that institutional pressure for North American scholars to achieve large numbers of "hits" in elite journals is greater than for European scholars (Dennis et al., 2006; Lyytinen, Baskerville, Iivari, & Te'eni, 2007). If such pressure to publish in elite journals is greater for North Americans and if IS journals are "parochial" according to Galliers and Meadows (2003) (who claim that most papers in North American IS journals are by North American authors and vice versa for European journals), then the greater pressure on North American researchers to score "hits" in elite North American journals may incent advisors or colleagues who play a role in helping on projects to expect author credit. This argument is speculative, but the results of H2 are consistent with such a view. As was true for H1, our results for H2 are consistent with the "opportunity cost of time" explanation that economists Barnett et al. (1988) offer. Of course, we need more work to know whether this is a key trigger to the huge increase in the average number of IS authors over the past 20 years.

Future work might also classify co-authored research according to other typologies, such as one distinguishing between true collaboration, mild collaboration, and simple connections among scholars (Hara, Solomon, Kim, & Sonnenwald, 2003). In a follow-up study to this, the first author classified 30 IS researchers with the most co-authored papers and divided them into scholars who primarily co-author with peers vs. those who primarily co-author with their former students (Gallivan, 2010). By focusing on researchers with at least seven co-authored papers, this classification identified some IS researchers who often publish with peer scholars but many more who frequently co-author with their former students. While this analysis was limited to 30 prolific IS researchers (each with at least seven co-authored papers in elite IS journals), it offers preliminary support to the notion that a large fraction of co-authored research in IS journals comprises advisor-student dyads rather than peer collaborators.

We found that gender sorting or homophily (Ibarra, 1992) occurs in IS research: men co-authored with other men, and women co-authored with other women at higher rates than one would expect by chance. As a result, opposite-sex co-author dyads are less common than one would expect by chance given the relative numbers of men and women in the IS field. While this result is consistent with prior work in economics (Boschini & Sjogren, 2007) and accounting (Welsh & Bremser, 2005), it also raises several new questions: why are IS researchers more inclined to choose same-sex co-author collaborators? Do IS authors actively choose same-sex co-authors and avoid opposite-sex ones or do broader structural factors influence the set of potential co-authors that are available to IS researchers with the observed patterns being an artifact of the broader institutional environments in which research takes place[21]? For instance, are women concentrated in certain institutions, or do women have different preferences for research topics or methods, relative to men? Another study that used a research topic typology that Sidorova, Evangelopoulos, Valacich, & Ramakrishnan (2008) had previously validated demonstrated that women were less likely than men to publish papers on three topics out of 13 subject areas (Gallivan, 2012)[22]. If much co-authoring does indeed consist of advisor-student teams, then it may be the case that PhD students choose same-sex advisors because same-

[21] We thank one reviewer for articulating the different ways in which one can interpret this observed outcome.

[22] The three topics for which women IS scholars were less likely to publish than men include two economics topics ("value of IT" and "IT and markets") and design science ("IS development"). Gallivan (2012) shows that, in relative terms, men were 60 percent more likely to publish journal papers on these topics than women.

sex advisors are prevalent (in the case of male students), as well as due to advisors' expertise in topics that interest them (in the case of male and female students). Likewise, for peer collaboration projects, it suggests similar biases in terms of choosing same-sex co-authors because the co-authors have similar topic interests. One important implication of this finding is that the paucity of women in the IS field is self-fulfilling and cyclical. That is, if women want to collaborate with other women and there are few of them in the field, then we are likely to perpetuate the cycle of underrepresenting women in IS field in general and in research schools in particular.

The most intriguing outcome of our study is that the relationship we expected to find between number of co-authors and citations was supported for just three journals (*MISQ*, *JMIS,* and *EJIS*) but not for the two other journals (*ISR* and *ISJ*). Most unusual was the negative relationship that we found between number of authors and citations for *ISR*, which exhibited a linear, inverse relationship. One explanation for this counter-intuitive, inverse relationship may be the fact that *ISR* publishes a much larger share of economics and "design science" research containing formal proofs, compared to other IS journals. Such papers may have different co-authoring patterns (i.e., a larger number of co-authors on average) and different citation norms compared to behavioral IS research (i.e., fewer references contained in each paper). The rate of citations to such papers may also be smaller than the number of citations to behavioral IS research if, in particular, the community of design science scholars is small relative to the size of the behavioral IS research community (Gallivan, 2011). Given the fact that fewer authors work in such subject areas, there may be fewer opportunities to have one's research cited.

Our findings also have implications for the research identity and structure of research clusters in the IS field. We believe that the number of citations to a published paper is not purely a measure of a paper's quality or theoretical contribution but rather that it also reflects the size of a specific research sub-community (i.e., the number of scholars who conduct research in the area who are likely to read and potentially cite a paper). The fact that design science papers and formal logic papers are cited less often than behavioral studies is more likely to reflect the much smaller size of these research communities compared to the behavioral research community (Oh, Choi, & Kim, 2006). Thus, there are different patterns of citations to papers in different sub-areas of IS research, and such differences in citation norms across sub-communities should be observable for *all* IS journals (and not just for *ISR*). For example, authors of design science papers generally avoid lengthy literature reviews with many citations to prior work. These differences suggest that the number of citations to a published study is not purely a measure of a study's contribution but also of the relative size of the sub-community that conducts work in a specific subject area (Gallivan, 2011).

We believe that citations reflect an authors' visibility as opposed to being purely a measure of a paper's quality per se (Lange & Frensch, 1999). In a study of accounting researchers, Brown (2005) demonstrates that authors who presented their work more frequently at conferences or colloquia were more likely to have their work cited after publication (based on an analysis of accounting journals). Thus, citations reflect an authors' social capital in the community. We know from sociology research that people both partner with and, in turn, cite other scholars who they know personally. Describing the phenomenon of sociocognitive networks in sociology, White, Wellman, and Nazer (2004) describe the reciprocal effects between scholars knowing each other personally and citing each other's work:

> *Intellectual ties [citations] and social ties cannot always be neatly separated…. [E]xplanatory power may lie in variables in which acquaintanceship and explicit subject interest are inextricably mixed. For want of a better label, such ties might be called sociocognitive. The sociocognitive network hypothesis is that these mixed ties are most important in… citation[s]. Sociocognitive ties, such as those between collaborators, blend interests* and [friendship] *in positive feedback duets.*

The notion that citations can reflect an authors' visibility rather than a paper's quality points to another line of future research to determine whether authors with leading editorial positions, visible leadership roles in professional societies, or those who frequently present their work at conferences are more widely cited. While we intuitively recognize that there is an association between publications, citations, and a researcher assuming editorial duties and other leadership roles in the community, the direction

of this relationship is unclear. Future research can attempt to unravel cause and effect. For example, relevant questions for future work are as follows: are authors more widely cited because they are visible leaders (e.g., journal editors, program chairs) or, conversely, are such invitations to leadership roles offered as a *result* of these scholars having been well published and highly cited authors in the past? These questions will require longitudinal data about the timing of publications, editorial and other leadership roles, and citations to specific works.

Many of our findings raise more questions than they answer. However, raising questions is a critical step towards bringing awareness of these issues and in beginning to address them. A dialogue among senior scholars to discuss the trends and whether they are in the desired direction can help determine adjustments that may be needed. Professional gatherings and publications can play a role in setting the direction that may be desired. For example, editorial missions, editorial composition, and conference themes and programs are important tools in devising a future vision for the field. Simple measures, such as designing workshops where researchers from varies area can come together to exchange ideas, can go a long way toward bringing sub-communities together.

In this paper, we introduce a new perspective for thinking about citations, which researchers in the past have implicitly assumed to be a measure of a study's quality (Lowry et al., 2007; Mingers & Xu, 2010; Porter et al., 1988). We posit that the number of citations to authors' publications reflects their visibility, connectedness, and social capital within their community (Brown, 2005; Cronin et al., 2003). Moreover, citations to authors who publish in different sub-areas are also a function of the size of the community who work in that area (Gallivan, 2012).

7. Limitations and Directions for Future Research

Our study has several limitations. First, while we explored homophily—a common focus of social networks research—we limited our focus to just two attributes: sex and shared institutional membership. Undoubtedly there are other aspects of homophily (e.g., similar epistemological orientation and similar cultural, ethnic, or regional background) that may predispose individuals to select each other as co-authors. Future work could investigate these aspects of homophily.

Second, we examined only instances of successful co-authorship (i.e., published papers in a set of elite IS journals). We did not study co-authorship that failed to lead to a journal publication or a paper appearing in a conference or other academic journals beyond our subset of five journals. Thus, as with all scientometric studies, our study suffers from the "success bias" (Ruef, Aldrich, & Carter, 2003) whereby we fail to observe a behavior (i.e., co-authorship) if it did not produce an actual publication.

Third, we included a limited set of journals in our study, which we did intentionally because we wanted to understand the dimensions of co-authorship as it applies to these five leading international IS journals. We make no claim that our findings are generalizable to other IS journals not included in our study. Of course, it would be interesting to see whether a broader set of IS journals (e.g., other European journals or journals published in other geographic regions such as Australia and Asia) yields similar results. Also, it might be useful to include publication data reflecting a longer period since it may shed light on changes in collaboration patterns. We analyzed our homophily hypotheses (H3 for sex; H4 for institutional homophily) for studies published only between 1999 and 2005; however, it would be interesting to examine a longer time interval.

Fourth, we relied on Thomson/ISI for our citation data (using their online "Web of Science" database), which necessarily limits the selection of journals to those belonging to the elite set of journals that Thomson admits to its selective indexing service. In recent years, other citation datasets have become available (e.g., Google Scholar and Elsevier's Scopus) that one may use as a substitute for or complement to Web of Science. Related to this point, we did not delete "self-citations" from the total number citations to each study in analyzing H5. Although some sociologists of science advocate removing such self-citations when examining scholarly influence, the leading author of scientometric research argues that one should *not* exclude self-citations from citation counts when assessing scholarly influence (Glänzel, Thijs, & Schlemmer, 2004; Glänzel, Debackere, Thijs, & Schubert, 2006).

Fifth, while we identified who engages in co-authoring, we did not consider the actual process of co-authorship, which includes how and why researchers collaborate. For instance, prior studies have identified different "types of collaboration" (Qin et al., 1997) and distinct roles that co-authors may play in a given project. For example, in a three-author project, one individual may provide the theory knowledge, a second author collects the data, and a third provide expertise in a particular analytic technique. Of course, it is impossible to attain this level of insight based on the type of archival data that are common in scientometric studies (and which we have used here). To gain greater insight, we may need qualitative interviews or open-ended survey questions to understand scholars' experiences with co-authoring or different types of coauthors, such as supervisors and peers (Gallivan, 2010). Researchers can use such alternate methodologies to gain insight into why authors choose specific collaborators and what experiences and outcomes accompany such choices (Creamer, 1999).

Finally, we did not specifically assess whether there are differences in co-authoring patterns between different topic areas of IS research, such as behavioral, economic, and design science research in IS (Oh et al., 2006). However, future studies could examine co-authorship patterns according to detailed subject area classifications (e.g., Sidorova et al., 2008) to determine whether some IS research topics exhibit different co-authorship patterns. For instance, Sidorova et al. (2008) identify 13 different topic areas based on lexical analysis of words appearing in the abstracts of papers in three journals. Likewise, Larsen, Monarchi, Hovorka, and Bailey (2008) identify seven primary IS sub-communities based on a bottom-up, lexical analysis of the abstracts of published papers in IS journals. Using the seven IS sub-communities they identified or the 13 topic areas revealed by the analysis in Sidorova et al. (2008),[23] future work could consider whether different co-authorship patterns occur across different topic areas. Future work might also compare whether the IS field more closely resembles social science fields like accounting and management (Acedo et al., 2006) or science fields like computer science and chemistry in terms of co-authorship patterns. Analyzing such co-authorship data may offer insights into the question of whether IS is more similar to social sciences or to natural sciences.

Despite the limitations we present above, we consider our study a useful contribution to sociology of science. Our study helps us understand the process of conducting IS research from a relational perspective as DeSanctis (2003) originally conceived. Our work sheds light on the greater incidence of co-authorship in IS research and the outcomes associated with it. We believe that, until now, few studies have considered the antecedents of co-authorship in the IS research community beyond a single conference venue. By analyzing papers in five leading IS journals over a seven-year period, we provide broader insights related to trends and geographic differences based on journal publication source. We also provide broader insights on outcomes of co-authorship in IS research. We believe that our study provides an opportunity for IS researchers to better understand the state of our field both in terms of where we have been in the past and how the process of doing our work continues to change over time.

[23] The seven communities that Larsen et al. (2008) identify are: management information systems, human-computer interaction, electronic commerce, systems and software engineering, global and societal issues, information storage and retrieval, and expert systems. Sidorova et al. (2008) identify 13 topics based on their analysis of three North American IS journals: IS development; IT and markets, IT management, IT adoption and use, IT for group support, IS discipline development, decision support systems, IT risk/project management, instrument development and validation, IT human resources, virtual collaboration, and individual IT use.

References

Abt, H. A. (1984). Citations to single and multiauthored papers. *Publications of the Astronomical Society of the Pacific*, *96,* 746-749.

Acedo, F. J., Barroso, C., Casanueva, C. and Galán, J. (2006). Coauthorship in management and organizational studies: An empirical and network analysis. *Journal of Management Studies*, *43*(5), 957-982.

Ahuja, M. (2002). Women in the information technology profession: A literature review, synthesis and research agenda. *European Journal of Information Systems, 11*(1), 20-34.

Ahuja, M., & Carley, K. (1999). Network structure in virtual organizations. *Organization Science*, *10*(6), 741-747.

Aldrich, H. E. (2001). Who wants to be an evolutionary theorist? *Journal of Management Inquiry*, *10*(2), 115-127.

Aldrich, H. E. (1999). *Organizations evolving*. Thousand Oaks, CA: Sage.

Alexander, J. C., & Mabry, R. (1994). Relative significance of journals, authors and articles cited in financial research. *Journal of Finance*, *49*(2), 697-712.

Allen, T. J. (1977). *Managing the flow of technology: Technology transfer and the dissemination of technological information within the R&D organization*. Cambridge, MIT Press.

Allen, G. N., Ball, N. L., & Smith, H. J. (2011). Information systems research behaviors: What are the normative standards? *MIS Quarterly*, 35(3), 533-551.

Agranoff, R., & McGuire, M. (2001). Big questions in public network management research. *Journal of Public Administration Research and Theory*, *11*(3), 295-396.

Athey, S., & Plotnicki, J. (2000). An evaluation of research productivity in academic IT. *Communications of the Association for Information Systems*, *3*, 1-20.

Avkiran, N. K. (1997). Scientific collaboration in finance does not lead to better quality research. *Scientometrics*, *39*(2), 173-184.

Barnett, A. H., Ault, R., & Kaserman, D. L. (1988). The rising incidence of coauthorship in economics: Further evidence. *Review of Economics and Statistics*, *70*(3), 539-543.

Bayer, A. E., & Smart, J. C. (1991). Career publication patterns and collaborative “styles” in American Academic Science. *Journal of Higher Education*, *62*(6), 615-636.

Beaver, D. D. (1986). Collaboration and teamwork in physics. *Czechoslovak Journal of Physics B*, *36*(1), 14-18.

Ben-David, J., & Sullivan, T. A. (1975). Sociology of science. *Annual Review of Sociology, 1*, 203-222.

Benbasat, I., & Zmud, R. W. (2003). The Identity Crisis within the IS discipline: Defining and Communicating the Discipline’s Core Properties. *MIS Quarterly*, *27*, 183-194.

Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley and Sons.

Boardman, P. C., & Corley, E. A. (2008). University research centers and the composition of research collaborations. *Research Policy*, *37*(5), 900-913.

Borgatti, S., & Foster, P. C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, *29*(6), 991-1013.

Borgatti, S. (2003). *The state of organizational social network research today (unpublished paper).* School of Management, Boston College. Retrieved from http://hbanaszak.mjr.uw.edu.pl/-TempTxt/PDF/Borgatti_200X_StateOfOrganizationalNetworkResearch.pdf

Börner, K., Maru, J. T., & Goldstone, R. L. (2004). The simultaneous evolution of author and paper networks. In *Proceedings of the National Academy of Sciences*. Retrieved from http://www.pnas.org/content/101/suppl.1/5266.full#aff-1

Bornmann, L., Mutz, R., Neuhaus, C., & Daniel, H.-D. (2008). Citation counts for research evaluation: Standards of good practice for analyzing bibliometric data and presenting and interpreting results. *Ethics in Science & Environmental Politics*, *8*(1), 93-102.

Boschini, A., & Sjogren, A. (2007). Is team formation gender neutral? Evidence from coauthorship patterns. *Journal of Labor Economics*, *25*(2), 325-365.

Boudreau, M. D., Gefen, D., & Straub, D. W. (2001). Validation in information systems research: A state-of-the-art assessment. *MIS Quarterly*, *25*(1), 1-16.

Bozeman, B., & Gaughan, M. (2011). Job satisfaction among academic faculty. *Journal of Higher Education*, *82*(2), 154-186.

Brown, L. (2005). The importance of circulating and presenting manuscripts: Evidence from the accounting literature. *Accounting Review*, *80*(1), 55-83.
Burkhardt, M. E. (1994). Social interaction effects following a technological change: A longitudinal perspective. *Academy of Management Journal*, *37*(4), 869-898.
Burt, R. (1980). Models of network structure. *Annual Review of Sociology*, *6*, 79-141.
Cady, S. H., & Valentine, J. (1999). Team innovation and perceptions of consideration: What difference does diversity make. *Small Group Research, 30*(6), 730-750.
Chen, W., & Hirschheim, R. (2004). A paradigmatic and methodological examination of IS research from 1991 to 2001. *Information Systems Journal*, *14*(3), 197-235.
Chin, G., Myers, J., & Hoyt, D. (2002). Social networks in the virtual science laboratory. *Communications of the ACM*, *45*(8), 87-92.
Chua, C., Cao, L., Cousins, K., & Straub, D. (2002b). Measuring researcher-production in information systems. *Journal of the AIS*, *3*(6), 145-215.
Chua, C., Cao, L., Cousins, K., Mohan, K., Straub, D., & Vaishnavi, V. (2002a). IS bibliographic repository: A central repository of research. *Communications of the AIS*, *8*, 1-43.
Chung, K. H., Cox, R. A., & Kim, K. A. (2009). On the relation between intellectual collaboration and intellectual output: Evidence from the finance academe. *Quarterly Review of Economics*, *49*, 893-916.
Clark, J. G., & Warren, J. (2006). In search of the primary suppliers of IS research: Who are they and where did they come from? *Communications of the AIS*, *18*, 296-328.
Cohen, P., Cohen, J., West, S. G., & Aiken, L. (2002). *Applied multiple regression/correlation analysis for the behavioral sciences* (5th ed.). Mahwah, NJ: Routledge.
Creamer, E. G. (1999). Knowledge production, publication productivity, and intimate academic partnerships. *Journal of Higher Education*, *70*(3), 261-277.
Cronin, B. (2001). Hyperauthorship: A postmodern perversion or evidence of a structural shift in scholarly communication practices? *Journal of American Society for Information Science & Technology*, *52*(7), 558-589.
Cronin, B. (1996). Rates of return to citation. *Journal of Documentation*, *52*(2), 188-197.
Cronin, B., & Meho, L. (2007). Timelines of creativity: Study of intellectual innovators in information science. *Journal of American Society for Information Science*, *58*(13), 1948-1959.
Cronin, B., & Overfelt, K. (1994). Citation-based auditing of academic performance. *Journal of American Society for Information Science*, *45*(2), 61-72.
Cronin, B., & Shaw, D. (2007). Peers and spheres of influence: Situating Rob Kling. *The Information Society*, *23*(4), 221-233.
Cronin, B., Shaw, D., & La Barre, K. (2003). A cast of thousands: Coauthorship and subauthorship collaboration in the 20th century. *Journal of the American Society for Information Science & Technology*, *54*(9), 855-871.
Cross, R., Rice, R. E., & Parker, A. (2001b). Information seeking in social context: Structural influences and receipt of information benefits. *IEEE Transactions on Systems, Man, and Cybernetics*, *31*(4), 438-448.
Culnan, M. J. (1986). The intellectual development of MIS Systems, 1972-1982: A co-citation analysis. *Management Science*, *32*(2), 156-172.
Culnan, M. J. (1987). Mapping the intellectual structure of MIS, 1980-1985: A co-citation analysis. *MIS Quarterly*, *11*(3), 341-343.
DeLone, W., & McLean, E. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9-30.
Dennis, A., Valacich, J. S., Fuller, M., & Schneider, C. (2006). Research standards for promotion and tenure in information systems. *MIS Quarterly*, *30*(1), 1-12.
DeSanctis, G. (2003). The social life of IS research: A response to Benbasat and Zmud's call for returning to the IT artifact. *Journal of the Association for Information Systems*, *4*(7), 360-376.
Ding, Y., Chowdhury, G., & Foo, S. (1999). Mapping intellectual structure of information retrieval studies: Author co-citation analysis. *Journal of Information Science*, *25*(1), 67-78.
Eaton, J. P., Ward, J. C., Kumar, A., & Reingen, P. H. (1999). Structural analysis of coauthor relationship and author productivity in selected outlets for consumer behavior research. *Journal of Consumer Psychology*, *8*, 39-59.

Edelson, E. (1998). *Francis Crick and James Watson: The building blocks of life* (Oxford Portraits in Science). New York, NY: Oxford University Press.

Eto, H. (2000). Authorship and citation patterns in operational research journals in relation to competition and reform. *Scientometrics*, *47*(1), 25-42.

Faloutsos, C., Mccurley, K. S., & Tomkins, A. (2004). Connection subgraphs in social networks. In SIAM International Conference on Data Mining, Workshop on Link Analysis, Counterterrorism and Security.

Fisher, B., Cobane, C., Vander Ven, T., & Cullen, F. (1998). How many authors does it take to publish an article? Trends and patterns in political science. *PS: Politcal Science & Politics*, *31*(4), 847-856.

Fleming, L., Mingo, S., & Chen, D. (2007). Collaborative brokerage, generative creativity, and creative success. *Administrative Science Quarterly, 52*(3), 443-475.

Fleming, L., & Sorenson, O. (2001). Technology as a complex adaptive system: Evidence from patent data. *Research Policy, 30*(7), 1019-1039.

Fox, M. F., & Faver, C. A. (1984). Independence and cooperation in research: The motivations and costs of collaboration. *Journal of Higher Education, 55*, 347-359.

Friedkin, N. E. (1993). Structural bases of interpersonal influence in groups: A longitudinal case study. *American Sociological Review*, *58*(6), 861-872.

Galletta, D., Henry, R. M., McCoy, S., & Polak, P. (2006). When the wait isn't so bad: The interacting effects of website delay, familiarity, and breadth. *Information Systems Research*, *17*(1), 20-37.

Galliers, R. D., & Meadows, M. (2003). A discipline divided: Globalization and parochialism in information systems research. *Communications of the Association for Information Systems*, *11*, 108-117.

Galliers, R. D., & Whitley, E. A. (2007). Vive les differences? Developing a profile of European IS research as a basis for international comparisons. *European Journal of Information Systems*, *16*(1), 20-35.

Gallivan, M. (2010). Analyzing frequent collaboration among IS scholars: What can we learn about IS coauthorship in general? In *Proceedings of the Americas Conference on Information Systems.*

Gallivan, M. J. (2011). Are citations to academic journal articles a measure of quality or something else? An exploratory analysis with emphasis on design science and IS technical research. In *Proceedings of 16th AMCIS conference*.

Gallivan, M. J. (2012). Analyzing citation impact of IS research by women and men: Do women have higher levels of research impact? In *Proceedings of the 50th Annual Conference on Computers and People Research* (pp. 175-184).

Gallivan, M., & Benbunan-Fich, R. (2007). Analyzing IS research productivity: An inclusive approach to global IS scholarship. *European Journal of Information Systems*, *16*(1), 36-53.

Gallivan, M., & Benbunan-Fich, R. (2008). Exploring the relationship between gender and career outcomes for social scientists: Implications for research on IS scholarship. *Information Technology & People*, *21*(2), 178-204.

Gardner, W., Mulvey, E. P., & Shaw, E. (1995). Regression analyses of counts and rates, poisson, overdispersed poisson, and negative binomial models. *Psychological Bulletin*, *118*, 392-404.

Glanzel, W. (2002). Coauthorship patterns and trends in the sciences (1980-1998): A bibliometric study with implications for database indexing and search strategies. *Library Trends*, *50*(3), 461-473.

Glänzel, W., & Schubert, A. (2004). Analyzing scientific networks through coauthorship. In H. F. M. Moed, W. Glänzel, & U. Schmoch (Eds.), *Handbook of quantitative science and technology research* (pp. 257-276). Amsterdam: Kluwer Publishing.

Glänzel, W., Thijs, B., & Schlemmer, B. (2004). A bibliometric approach to the role of author self-citations in scientific communication. *Scientometrics, 59*(1), 63-77.

Glänzel, W., Debackere, K., Thijs, B., & Schubert, A. (2006). A concise review on the role of author self-citations in information science, bibliometrics and science policy. *Scientometrics, 67*(2), 263-277.

Gordon, M. (1980). A critical reassessment of inferred relations between multiple authorship, scientific collaboration, the production of papers and acceptance for publication. *Scientometrics*, *2*, 193-210.

Grant, L., & Ward, K. B. (1991). Gender and publishing in sociology. *Gender & Society*, 5(2), 207-223.

Gu, Y. (2004). Global knowledge management research: A bibliometric analysis. *Scientometrics*, *61*(2), 171-190.

Guimerà, R., Uzzi, B., Spiro, J., & Amaral, L. (2005). Team assembly mechanisms determine collaboration network structure and team performance. *Science, 308*(5722), 697-702.
Hammermesh, D. S., & Oster, S. M. (2002). Tools or toys? The impact of high technology on scholarly productivity. *Economic Inquiry*, *40*(4), 539-555.
Hara, N., Solomon, P., Kim, S., & Sonnenwald, D. (2003). An emerging view of scientific collaboration: Scientists perspectives on collaboration and factors that impact collaboration. *Journal of the American Society for Information Science & Technology*, *54*(10), 952-965.
Hasselback, J. R., Reinstein, A. R., & Schwan, E. (2003). Prolific authors of accounting literature. *Advances in Accounting*, *20*, 95-125.
Henry, N., Goodell, H., Elmqvist, N., & Fekete, J.-D. (2007). 20 years of four HCI conferences: A visual exploration. *International Journal of Human-Computer Interaction*, *23*(3), 239-285.
Ho, V. T., & Levesque, L. (2005). With a little help from my friends (and substitutes): Social referents and influence in psychological contract fulfillment. *Organization Science*, *16*, 275-289.
Hollis, A. (2001). Coauthorship and the output of academic economists. *Labour Economics*, *8*, 503-530.
Horn, D., Finholt, T. A., Birnholtz, J. P., Motwani, D., & Jayaraman, S. (2004). Six degrees of Jonathan Grudin: A social network analysis of the evolution and impact of CSCW research. In *Proceedings of Conference on Computer Supported Cooperative Work* (pp. 582-591).
Huang, H.-H., & Hsu, J. S. (2005). An evaluation of publication productivity in IS: 1999 to 2003. *Communications of the Association for Information Systems*, 555-564.
Hudson, J. (1996). Trends in multi-authored papers in economics. *Journal of Economic Perspectives*, *10*(3), 153-158.
Ibarra, H. (1992). Homophily and differential returns: Sex differences in network structure and access in access in an advertising firm. *Administrative Science Quarterly*, *37*, 422-447.
Ibarra, H. (1995). Race, opportunity, and diversity of social circles in managerial networks. *Academy of Management Journal*, *38*, 673-701.
Ibarra, H., & Andrews, S. (1993). Power, social influence, and sense making: Effects of network centrality and proximity on employee perceptions. *Administrative Science Quarterly*, *38*, 277-303.
Im, K.S., Dow, K., & Grover, V. (2001). A reexamination of IT investment and the market value of the firm. *Information Systems Research*, *12*, 103-117.
Joshi, A., & Roh, H. (2009). The role of context in work team diversity research: A meta-analytic review. *Academy of Management Journal, 52*, 599-628.
Karahanna, E., Straub, D., & Chervany, N. (1999). IT adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, *23*(2), 183-207.
Katz, J. S. (1994). Geographical proximity and scientific collaboration. *Scientometrics*, *31*(1), 31-43.
Katz, J. S., & Martin, B. R. (1997). What is research collaboration. *Research Policy*, *26*(1), 1-18.
Kaye, J. (2009). Some statistical analyses of CHI. In *Proceedings of the 27th International Conference Extended Abstracts on Human Factors in Computing systems* (pp. 2585-2594). New York, NY: ACM.
Kimery, K. M., Rinehart, S., & Mellon, M. (2003). Gendered patterns in academic authorship: Examples from the MIS discipline. In *Proceedings of the 9th AMCIS Conference* (pp. 1567-1572).
Klein, H. K., & Hirschheim, R. (2008). The structure of the IS discipline reconsidered: Implications and reflections from a community of practice perspective. *Information and Organization*, 18(4), 280-302.
Kock, N. (2004). The psychobiological model: Towards a new theory of computer-mediated communication based on Darwinian evolution. *Organization Science*, *15*(3), 327-348.
Kolaczyk, E. D. (2009). *Statistical analysis of network data: Methods and models*. Berlin: Springer-Verlag.
Kraut, R. E., Egido, C., & Galegher, J. (1990). Patterns of contact and communication in scientific research collaboration. In J. Galegher, R. E. Kraut, & C. Egido (Eds.), *Intellectual teamwork* (pp. 149-171). Hillsdale, NJ: Lawrence Erlbaum.
Kraut, R. E., Rice, R., Cool, C., & Fish, R. (1998). Varieties of social influence: The role of utility and norms in the success of a new communication medium. *Organization Science*, *9*, 437-457.
Kyvik, S., & Teigen, M. (1996). Child care, research collaboration, and gender differences in scientific productivity. *Science, Technology, & Human Values, 21*(1), 54-71.
Laband, D. N., & Piette, M. J. (1995). Team production in economics: Division of labor or mentoring? *Labour Economics*, *2*, 33-40.

Laband, D. N., & Tollison, R. D. (2000). Intellectual collaboration. *Journal of Political Economy*, *108*(3), 632-662.
Lange, L., & Frensch, P. A. (1999). Gaining scientific recognition by position: Does editorship increase citation rates? *Scientometrics*, 44(3), 459-486.
Larsen, K. R., Monarchi, D. E., Hovorka, D. S., & Bailey, C. N. (2008). Analyzing unstructured text data: Using latent categorization to identify intellectual communities in information systems. *Decision Support Systems*, *45*(4), 884-896.
Lee, S., & Bozeman, B. (2005). The effects of scientific collaboration on productivity. *Social Studies of Science*, *35*(5), 673-702.
Leenders, T. Th. A. J. (1996). Dynamics of friendship and best friendship choices. *Journal of Mathematical Sociology, 86*, 1203-1235.
Leimu, R., & Koricheva, J. (2005). Does scientific collaboration increase the impact of ecological articles? *BioScience*, *55*(5), 438-443.
Lindsey, D. (1978). The scientific publication system in social science. San Francisco: Jossey Bass.
Lipnack, J., & Stamps, J. (1994). The age of the network: organising principles for the 21st Century. New York, NY: Omneo.
Lowry, P. B., Romans, D., & Curtis, A. (2004). Global journal prestige and supporting disciplines: A scientometric study of information systems. *Journal of the AIS*, *5*(2), 29-77.
Lowry, P. B., Karuga, G. G., & Richardson, V. (2007). Assessing leading institutions, faculty and articles in premier IS research journals. *Communications of the AIS*, *20*, 142-203.
Lungeanu, A., & Contractor, N. (2015). The effects of diversity and network ties on innovations: The emergence of a new scientific field. *American Behvioral Scientist, 59*(5), 548-564.
Lyytinen, K. (1999). Empirical research in information systems: On the relevance of practice in thinking of IS research. *MIS Quarterly*, *23*(1), 25-28.
Lyytinen, K., & King, J. L. (2004). Nothing at the center? Academic legitimacy in the information systems field. *Journal of the Association for Information Systems*, *6*, 220-246.
Lyytinen, K., Baskerville, R., Iivari, J., & Te'eni, D. (2007). Why the old world cannot publish? Overcoming challenges in publishing high-impact research. *European Journal of Information Systems*, *16*(7), 317-326.
Maddox, B. (2003). *Rosalind Franklin: The dark lady of DNA*. New York: Harper Perennial.
Mangold, W. D., Bean, L. and Cummings, M (1994). A cohort analysis of the changing gender composition of MIS faculty, *Journal of Computer Information Systems*, *39*(1), 1998, 7-13.
Matzler, K., & Renzl, B. (2002). Patterns in management research: An analysis of US American, European and German approaches. *Problems and Perspectives in Management*, *1*, 118-127
McDowell, J. M., & Melvin, M. (1983). The determinants of coauthorship: An analysis of the economics literature. *Review of Economics & Statistics*, *63*, 155-160.
McDowell, J. M., Singell, L. D., & Slater, M. (2006). Two to tango? Gender differences in the decision to publish and coauthor. *Economic Inquiry*, *44*(1), 153-168.
McDowell, J. M., & Smith, J. K. (1992). The effect of gender-sorting on propensity to coauthor: Implications for academic promotions. *Economic Inquiry*, *30*(1), 68-82.
Meyer, G. W. (1994). Social information processing and social networks: A test of social influence mechanisms. *Human Relations*, *47*(9), 1013-1047.
Mingers, J., & Xu, F. (2010). The drivers of citations in management science journals. *European Journal of Operational Research*, 205(2), 422-430.
Molka-Danielsen, J., Richardson, D., Deutschmann, M., & Carter, B. (2007). Teaching languages in a virtual world. In L. Habib (Ed.), *NOKOBIT* (pp. 97-110). Trondheim, Norway: Tapir Akademisk Forlag.
Moody, J. (2004). The structure of a social science collaboration network. *American Sociological Review*, *69*, 213-238.
Nagpaul, P. S. (2003). Exploring a pseudo-regression model of transnational cooperation in science. *Scientometrics*, *45*, 403-416.
Newman, M. E. J. (2004a). Coauthorship networks and patterns of scientific collaboration. *PNAS: A Publication of the National Academy of Sciences*, *101*(1), 5200-5205.
Newman, M. E. J. (2004b). Who is the best connected scientist? A study of scientific coauthorship networks. *Lecture Notes in Physics*, *650*, 337-370.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company*. New York: Oxford University Press.
Oh, W., Choi, J. N., & Kim, K. (2006). Coauthorship dynamics and knowledge capital: The patterns of cross-disciplinary collaboration in IS research. *Journal of Management Information Systems*, *22*(3), 266-292.
Oromaner, M. (1975). Collaboration and impact: The career of multi-authored publications. *Social* Otte, E., & Rousseau, R. (2002). Social network analysis: A powerful strategy for the information sciences. *Journal of Information Science*, *28*(6), 441-453.
Papatheodorou, S., Trikalinos, T., & Ioannidis, J. (2008). Inflated numbers of authors over time have not been just due to increasing research complexity. *Journal of Clinical Epidemiology*, *61*(6), 546-551.
Patel, N. (1972). Collaboration in the professional growth of American sociology. *Social Science Information*, *12*, 677-692.
Paul, R. (2005). Editor's view: An opportunity for editors of IS journals to relate their experiences and offer advice. First in a series, *European Journal of Information Systems*, *14*(3), 207-212.
Pelled, L., Eisenhardt, K., & Xin, K. (1999). Exploring the black box: An analysis of work group diversity, conflict, and performance. *Administrative Science Quarterly*, *44*(1), 1-28.
Piette, M. J., & Ross, K. (1992a). An analysis of the determinants of coauthorship in economics. Journal. *Journal of Economic Education*, *23*(3), 277-283.
Piette, M. J., & Ross, K. (1992b). A study of the publication of scholarly output in economics journal. *Eastern Economic Journal*, *18*(4), 429-439.
Ponzi, L. (2002). The intellectual structure of knowledge management: A bibliometric study of its early stage of development. *Scientometrics*, *55*(2), 259-272.
Porter, M. E. (199). *Competitive advantage of nations*. New York: Free Press.
Price, D. J. d. S. (1963). *Little science, big science*. New York, NY: Columbia University Press.
Price, D. J. d. S. (1986). *Little science, big science…and beyond*, New York: Columbia.
Qin, J., Lancaster, F., & Allen, B. (1997). Types and levels of collaboration in interdisciplinary research in the sciences. *Journal of the American Society for Information Science*, *48*(10), 893-916.
Raghuram, S., Tuertscher, P., & Garud, R. (2010). Research note—mapping the field of virtual work: A cocitation analysis. *Information Systems Research*, 21(4), 983-999.
Rice, R. E. (1993). Using network concepts to clarify sources and mechanisms of social influence. In W. Richards, Jr., & G. Barnett (Eds.), *Progress in communication sciences: Advances in communication network analysis* (pp. 43-52). Norwood, NJ: Ablex.
Rice, R., & Aydin, C. (1991). Attitudes toward new organizational technology: Network proximity as a mechanism for social information processing. *Administrative Science Quarterly*, *36*, 219-244.
Riedl, R.& Rueckel, D. (2011). Historical development of research methods in the information systems discipline. In *Proceedings of the 9^{17h} Americas Conference on Information Systems*.
Rowe, F. (2010). Editorial: Valuing worldwide diversity in a European spirit: Being more critical and open," *European Journal of Information Systems*, *19*, 495-500.
Ruef, M., Aldrich, H. E., & Carter, N. (2003). The structure of founding teams: Homophily, strong ties, and isolation among U.S. entrepreneurs. *American Sociological Review*, *68*(2), 195-222.
Sacco, W. P., & Milana, S. (1984). Increase in number of authors per article in ten APA journals. *Cognitive Therapy and Research*, *8*(1), 77-84.
Salancik, G. R. (1995). WANTED: A good network theory of organization. *Administrative Science Quarterly, 40(2), 345-349.*
Saxenian, A. L. (1994). *Regional advantage: Culture and competition in Silicon Valley and Route 128*. Cambridge, MA: Harvard University Press.
Scharpf, F. W. (1978). Interorganizational policy studies: Issues, concepts and perspectives. In K. I. Hanf & F. W. Scharpf (eds.), *Interorganizational policy making: Limits to coordination and central control* (pp. 345-370). London: Sage.
Stvilia, B., Hinnant, C. C., Schindler, K., Worrall, A., Burnett, G., Burnett, K., Kazmer, M. M., & Marty, P. F. (2011). Composition of scientific teams and publication productivity at a national science lab. *Journal of the American Society for Information Science & Technology, 62*(2), 270-283.
Sidorova, A., Evangelopoulos, N., Valacich, J. S., & Ramakrishnan, T. (2008). Uncovering the intellectual core of the IS discipline. *MIS Quarterly*, *32*(3), 467-468.

Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, *17*, 45-62.

Spruell, J., & McCord, M. (2003). Gender differences in faculty publications in IT. In *Proceedings of the 9th Americas Conference on Information Systems* (pp. 1581-1584).

Stvilia, B., Hinnant, C. C., Schindler, K., Worrall, A., Burnett, G., Burnett, K. & Marty, P. F. (2011). Composition of scientific teams and publication productivity at a national science lab. *Journal of the American Society for Information Science & Technology*, 62(2), 270-283.

Straub, D. (2006). The value of scientometric studies. *Journal of the Association for Information Systems*, *7*(5), 241-246.

Susarla, A., Barua, A., & Whinston, A. B. (2003). Understanding the service component of application service provision: An empirical analysis of ASPs. *MIS Quarterly*, *27*(1), 91-123.

Taylor, A., & Greve, H. R. (2006). Superman or the Fantastic Four? Knowledge combination and experience in innovative teams. *Academy of Management Journal*, *49*(4), 723-740.

Thomas, A. C. (2009). *Hierarchical models for relational data* (unpublished dissertation). Department of Statistics, Harvard University, Cambridge, MA.

Tomassini, M., & Luthi, L. (2007). Empirical analysis of the evolution of a scientific collaboration network. *Physica A*, *385*, 750-764.

van Knippenberg, D., De Dreu, C. K. W., & Homan, A. C. (2004). Work group diversity and group performance: An integrative model and research agenda. *Journal of Applied Psychology*, *89*, 1008-1022.

Venkatesh, V., Davis, F., Davis, G. & Morris, M. (2003). User acceptance of IT: toward a unified view. *MIS Quarterly*, *27*(3), 425-478.

Vessey, I., Ramesh, V., & Glass, R. L. (2002). Research in information systems: An empirical study of diversity in the discipline. *Journal of Management Information Systems*, *19*, 129-174.

Vidgen, R., Henneberg, S., & Naude, P. (2007). What sort of community is the European Conference on Information Systems? A social network analysis 1993-2005. *European Journal of Information Systems*, *16*(1), 5-19.

Walstrom, K. A., & Leonard, L. (2000). Citation classics from the information systems literature. *Information & Management*, *38*(2), 59-72.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. New York, NY: Cambridge University Press.

Weisband, S., Thatcher, S. M., and Xu, J. (2005). Using bibliometric analysis to evaluate scientific progress in virtual teams research. *Proceedings of 65th Academy of Management Meeting*.

Welsh, M. J., & Bremser, W. (2005). Accounting faculty research collaboration: A study of relationship benefits and gender differences. *Global Perspectives on Accounting Education*, *2*, 19-36.

West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology: An International Review, 51*(3), 355-387.

White, H. D. (2003). Pathfinder networks and author cocitation analysis: A remapping of paradigmatic information scientists. *Journal of the American Society for Information Science & Technology*, 54(5), 423-434.

White, H., & McCain, K. W. (2008). Visualizing a discipline: An author co-citation analysis of information science, 1972-1995. *Journal of the American Society for Information Science*, *49*(4), 327-355.

White, H., Wellman, B., & Nazer, N. (2004). Does citation reflect social structure? longitudinal evidence from the “Globenet” interdisciplinary research group. *Journal of the American Society for Information Science & Technology*, *55*(2), 111-126.

Whitley, E. A., & Galliers, R. D. (2007). An alternative perspective on citation classics: Evidence from the first ten years of the European Conference on Information Systems. *Information & Management*, *44*, 441-455.

Willcocks, L., Whitley, E. A., & Avgerou, C. (2008). The ranking of top IS journals: A perspective from the London School of Economics. *European Journal of Information Systems*, *17*(2), 163-168.

Xu, J., & Chau, M. (2006). The social identity of IS: Analyzing the collaboration network of the ICIS conferences (1980-2005). In *Proceedings of 27th ICIS Conference*.

Zhang, P., & Li, N. (2005). The intellectual development of human-computer interaction research: A critical assessment of the MIS literature (1990-2002). *Journal of the AIS*, *6*(11), 227-292.

Appendix

"Blockbuster" and "Outlier" Papers

Blockbusters (bolded) are papers with citation rates more than four standard deviations above the mean citation rate. Outliers are papers more than two standard deviations above the mean citation rate. The second and third columns note the paper's citations and citation rate as of early 2011.

Table A1. Blockbuster and Outlier Papers

European Journal of Information Systems	**Citations**	**Citation rate**
There were five outliers (> 3.8 citations/yr) and two blockbusters (> 6.15 citations/yr)		
Ahuja, M. (2002). Women in the information technology profession: A literature review, synthesis and research agenda. *EJIS, 11*(1), 20-34.	24	4.00
Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: A case study of inter-relations between critical success factors. *EJIS, 11*, 35-47.	**45**	**7.5**
Barrett, M. (1999). Challenges of EDI adoption for electronic trading in the London insurance market. *EJIS, 8*, 1-15.	43	4.78
van der Heijden, H., Verhagen, T., & Creemers, M. (2003). Understanding online purchase intentions: Contributions from technology and trust perspectives. *EJIS, 12*(1), 41-48.	25	5.00
Kern, T., & Willcocks, L. (2002). Exploring relationships in IT outsourcing. *EJIS, 11,* 3-19.	23	3.83
Kotlarsky, J. & Oshri, I. (2005). Social ties, knowledge sharing and successful collaboration in globally distributed system development projects. *EJIS, 14*(1), 37-48.	**24**	**8.00**
Zhu, K., Kraemer, K., & Xu, S. (2003). Electronic business adoption by European firms: A cross-country assessment of the facilitators and inhibitors. *EJIS, 12*(4), 251-268.	28	5.60
Information Systems Journal		
There were 7 outlier papers (> 5.0 citations/yr) and 1 blockbuster (> 8.3 citations/yr):		
Bergquist, M. & Ljungberg, J. (2005). The power of gifts: Organizing social relationships in open source communities. *ISJ, 11*(4), 305-320.	35	5.00
Carter, L. & Belanger, F. (2005) The utilization of egovernment services: citizen trust, innovation and acceptance factors. ISJ, *15*(1), 5-25.	**31**	**10.3**
Chen, W. S. & Hirschheim, R. (2004). "A paradigmatic and methodological examination of IS research from 1991 to 2001," *ISJ, 14*(3), 197-235.	25	6.33
Chudoba, K. Wynn, E., Lu, M. & Watson-Manheim, M. (2005). "How virtual are we? Measuring virtuality and understanding its impact in a global organization. *ISJ, 11(*3), 279-306.	15	5.00
Davison, R., Martinsons, M. & Kock, N. (2004). Principles of canonical action research. *ISJ, 14*(1), 65-86.	30	7.5
Irani, Z., Love, P.E.D., Elliman, T., et al. (2005). "Evaluating egovernment: Learning from the experiences of two UK local authorities. *ISJ, 15*(1), 61-82.	19	6.3
Lyytinen, K. & Robey, D. (1999). "Learning failure in IS development. *ISJ, 9(2),* 85-101.	48	5.33
Seddon, P. & Shang, S. (2002). Assessing and managing the benefits of enterprise systems. *ISJ, 12*(4), 271-299.	34	5.7

Table A1. Blockbuster and Outlier Papers (Cont.)		
Information Systems Research		
There were seven outlier papers (>12 citations/yr) and two blockbusters (> 20.2 citations/yr)		
Chin, W., Marcolin, B., & Newsted, P. (2003). A partial least squares latent variable modeling approach for measuring interaction effects. *ISR, 14*, 189-217.	81	16.20
Choudhury, V., McKnight, H., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce, *ISR, 13*(3), 334-359.	**135**	**22.5**
Devaraj, S., Fan, M., & Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics. *ISR, 12*(3), 316-333.	84	14.0
Iacono, C. S., & Orlikowski, W. J. (2001). Research commentary: Desperately seeking the "IT" in IT research: A call to theorizing the IT artifact. *ISR, 12*(2), 121-134.	124	17.7
Koufaris, M. (2002). Applying the TAM model and flow theory to online consumer behavior. *ISR, 13*(2), 205-223.	119	19.8
McKinney, V., Yoon, K., & Zahedi, M. (20002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *ISR, 13*(3), 296-315.	98	16.3
Palmer, J. (2002). Web site usability, design and performance metrics. *ISR, 13*(2), 151-167.	99	16.5
Pavlou, P., & Gefen, D. (2004). Building effective online marketplaces with institution-based trust. *ISR, 15*(1), 37-59.	59	14.8
Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the TAM model. *ISR, 11*(4), 342-365.	**204**	**25.5**
Journal of Management Information Systems		
There were eight outliers (> 8.1 citations/yr) and one blockbuster (> 15 citations/yr)		
Bhattacherjee, A. (2002). Individual trust in online firms: Scale development and test," 2002, *Journal of MIS, 19*(1), 211–241.	60	10.0
Davenport, T., & Grover, V. (2001). General perspectives on knowledge management. *Journal of MIS, 18*(1), 5-21.	61	8.7
DeLone, W., & McLean, E. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of MIS, 19*, 9-30.	**167**	**33.4**
Gold, A. H., Malhotra, A., & Segars, A. (2001). Knowledge management: An organizational capabilities perspective. *Journal of MIS, 18*(1), 185-214	84	12.0
Hitt, L., Wu, D. J., & Zhou, X. (2002). Investment in ERP: Business impact and productivity measures. *Journal of MIS, 19*(1), 71-98.	54	9.0
Hu, P., Chau, P. Y., Sheng, O., & Tam, K.-Y. (1999). Examining the TAM model using physician acceptance of telemedicine technology. *Journal of MIS, 16*(2), 91-112.	117	13.0
Markus, M. L. (2001). Toward a theory of knowledge reuse: Types of knowledge reuse situations and factors in reuse success. *Journal of MIS, 18*(1), 57-93.	70	10.0
Robey, D., Ross, J. W., & Boudreau, M. (2002). Learning to implement enterprise systems: An exploratory study of dialectics of change. *Journal of MIS, 19*, 17-46.	87	14.5
Tallon, P., Kraemer, K., & Gurbaxani, V. (2000). Executives' perceptions of the business value of information technology: A process-oriented approach. *Journal of MIS,* 16(4), 145-173.	74	9.3

Table A1. Blockbuster and Outlier Papers (Cont.)		
MIS Quarterly		
There were three outliers (> 21.5 citations/yr) and three blockbusters (> 33.3 citations/yr).		
Alavi, M., & Leidner, D. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly, 25*(1), 107-136.	**281**	**40.1**
Bharadwaj, A. (2000). A resource-based perspective on IT capability and firm performance: An empirical investigation. *MIS Quarterly, 24*(1), 169-196.	174	21.8
Gefen, D., Karahanna, E., & Straub, D. (2003). Trust and TAM in online shopping. *MIS Quarterly, 27*(1), 51-90.	**203**	**40.0**
Klein, H., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly, 23*(1), 67-93.	196	21.8
Venkatesh, V., Davis, F., Morris, M., & Davis, G. (2003). User acceptance of IT: Toward a unified view. *MIS Quarterly, 27*(3), 425-478.	**277**	**55.4**
Venkatesh, V. & Morris, M. (1999). Why don't men ever stop to ask for directions? Gender, social influence and their role in technology acceptance and usage behavior. *MIS Quarterly, 24*(1), 115-139.	179	22.4

About the Authors

Michael (Mike) J. GALLIVAN was Associate Professor in Georgia State University's Robinson College of Business in Atlanta during the time this research occurred. He is now a Visiting Professor at Kennesaw State University's Coles College of Business. He holds a Ph.D. from MIT, an MBA and MHA from the University of California, Berkeley, and a BA from Harvard University. He has served as Associate Editor and Guest Senior Editor for MIS Quarterly, as well as Associate Editor for European Journal of Information Systems, Journal of the Association for Information Systems, Journal of Management Information Systems, and Journal of Information Technology. He was the recipient of the 2008 Best Paper award at MIS Quarterly (along with Andrew Burton-Jones). His work has appeared in journals such as European Journal of Information Systems, Information & Management, Information and Organization, Information Systems Journal, Information Technology & People, International Journal of eCollaboration, IEEE Transactions on Professional Communication, MIS Quarterly, MISQ Executive, and Journal of Management Information Systems. His work focuses on behavioral issues related to IT in organizations and society, as well as scientometric research on the history, development, and influence of the IS research community on other disciplines.

Manju AHUJA is Professor and University Scholar in the CIS Department at the College of Business, University of Louisville, Kentucky. She has previously held faculty positions at the Kelley School of Business (Indiana University), Florida State University, and Pennsylvania State University. Her publications have appeared in journals such as MIS Quarterly, Management Science, Information Systems Research, Organization Science, Journal of Management, European Journal of Information Systems, Journal of MIS, Journal of AIS, Small Group Research, Decision Support Systems, Communications of the ACM, Database for Advances in Information Systems, and the Journal of Computer-Mediated Communications. She has been ranked among the top 100 researchers in the field of Information Systems (rankings ranges from 11 to 81) worldwide by a variety of sources (e.g., Gallivan and Benbunan-Fich, 2006; http://vvenkatesh.com/isranking). She has served in editorial roles at many elite journals including Management Information Systems Quarterly (Senior Editor, 2014-2016, Associate Editor, 2010-2013), Information Systems Research (Associate Editor, 2006-08) and Management Science (Guest Editor). She served as Division Chair (2011-12) of the Academy of Management's OCIS division and has served as Program chair for this division in 2010. She is actively involved in research on issues related to HR issues in IT, mobile technologies and work-life balance, and virtual communities and teams.