Collaboration in information and library science doctoral education

Cassidy R. Sugimoto

School of Library and Information Science, Indiana University Bloomington, 1320 E. 10th St., LI029, Bloomington, IN 47405-3907, USA

A R T I C L E I N F O	A B S T R A C T
Available online 27 November 2010	Coauthorship is increasing across all areas of scholarship. Despite this trend, dissertations as sole-authored monographs are still revered as the cornerstone of doctoral education. As students learn the norms and communicative behaviors of their field during their doctoral education, do they also learn collaborative behaviors? This study investigated this issue through triangulation of 30 interviews, 215 questionnaires, and bibliometric analyses of 97 CVs in the field of library and information science (LIS). The findings demonstrate that collaboration occurs in about half of advisee/advisor relationships and is primarily understood as research dissemination outside the dissertation. Respondents reported that the dissertation was not and should not be considered a collaborative product. The discussion also includes a commentary about grant funding and the implications for this on models of academic scholarship and research production.

1. Introduction

Authorship has been called the "undisputed coin of the real in academia" and "absolutely central to the operation of the academic reward system" (Cronin, 2001b, p. 559). However, the concept of authorship has evolved over the course of the 20th century, with a steady increase in collaboration (Cronin, 2004), hyperauthorship[1] (Cronin, 2001b), and subauthorship[2] (Heffner, 1979, 1981; Harsanyi, 1993; Cronin, 2001a; Cronin, Shaw, & La Barre, 2003, 2004; Cronin, McKenzie, & Rubio, 1993; McCain, 1991). This trend was anticipated by Price (1963), who stated that "by 1980 the single-author paper will be extinct" and scholarly publications will "move steadily toward an infinity of authors per paper" (p. 89).

The presence of multiple creators for a given product complicates issues of ownership, ethics, and measurement of contribution. As Merton (1973) noted, "the growth of team work not only makes problematic the recognition of individual contributions by *others*; it also makes problematic the evaluation of contributions *by themselves*" (p. 332) (italics in the original). Many scholars have advocated for stricter editorial policies to combat author inflation (Garfield, 1982), and some editorial bodies have issued statements defining authorship. The editors of the *New England Journal of Medicine*, for example, defined authorship as substantial contribution in three areas: (a) conception and design, or analysis and interpretation of data; (b) drafting of the manuscript or revising it critically for intellectual content; and (c) final approval of the version of the manuscript to be published (Syrett & Rudner, 1996).

Definitions of authorship are further complicated by the often synonymous interchange of the term collaboration with co-authorship. Some of the broader definitions of collaboration include "a process of function interdependence between scholars in their attempt to coordinate skills, tools, and rewards" (Patel, 1973, p. 80) and "interaction taking place within a social context among two or more scientists that facilitates the sharing of meaning and completion of tasks with respect to a mutually shared, superordinate goal" (Sonnenwald, 2007, p. 645). However, when operationalizing collaboration, scholars often evaluate research output, evidenced through publications (Price & Beaver, 1966).

Studies have supported the fact that there are many positive correlates with collaboration, including scores on quality metrics (Lawani, 1986), productivity as measured by research output (Price & Beaver, 1966; Reskin, 1977; Fox, 1983; Pao, 1982), acceptance for publication (Presser, 1980; Gordon, 1980; Hernon, Smith & Croxen, 1993; Bahr & Zemon, 2000), impact as measured through citations (Oromaner, 1974; Smart & Bayer, 1986; Goldfinch, Dale, & DeRouen, 2003), increased social capital (Haythornthwaite, 2006), and higher amounts of funding (Price, 1981; Heffner, 1981; Hart, Carstens, LaCroix, & May, 1990).

Some models argue that all authorship is collaborative, using the idea of distributed cognition to propose that all intellectual activity is situated in a complex sociocultural world and that all academic writing is intrinsically collaborative (Cronin, 2004). This model calls for more explicitly listing contributions and better examining "paratextual elements of scholarly publications" when evaluating authorship (Cronin, 2004, p. 559).

2. Problem statement

Collaboration between advisors and students is seen as a critical aspect of mentoring (Busch, 1985; Cameron & Blackburn, 1981;

---

[1] That is, the increasing number of authors on the byline of a publication.

[2] That is, the increase in contributors of a publication, often listed in the acknowledgement section, but not on the byline.

Jacobi, 1991; Lipschutz, 1993) that can increase the student's "productivity, success, and competence" (Green & Bauer, 1995, p. 542) and serve as one of the most powerful learning experiences for doctoral students (Ashford, 1996). This form of mentoring may be especially important in those fields where collaborative research is the current model of scholarship. As faculty mentors are expected to "impart the norms and expectations" (Girves & Wemmerus, 1988, p. 171) of the discipline, it is important that they teach their students how to engage in collaborative authorship (if that is the norm within their discipline).

However, despite trends toward collaboration in LIS literature, doctoral education in this field still maintains the dissertation as a single-authored monograph, as the cornerstone of the disserting process. The dissertation is designed to serve as a demonstration of the student's ability to conduct independent research, and the completion of this product marks the student ready for entrance into the scholarly community.

As the communicative norms of the scholarly community change, so must education of new scholars. Previous work has shown that the expectations for dissertations in science and engineering have changed as they have embraced more collaborative models of scholarship (Ziolkowski, 1990). However, very little is known regarding the degree to which LIS doctoral students are exposed to and participate in collaborative activities and the degree to which the dissertation itself could be seen as a collaborative product. This begs the question: To what degree are we preparing doctoral students to engage in collaborative research? To address this, this study proposes the following two research questions:

1. What is the extent of collaboration between LIS advisors and advisees?
2. To what extent can the dissertation be seen as a collaborative product?

Understanding the degree to which collaboration exists in doctoral education is a necessary reflective practice for the creators and consumers of this education. "Big Science" models of productivity are beginning to dominate the social sciences (Cronin, 2001b). This model has been characterized as having two definitions—one focusing on the large-scale nature of the science under investigation and the other referring to the maturation of a given field (Borgman, 2007). Collaborative modes of production are seen to fit squarely into both of these models, indicative of science that requires larger teams and the synthesis of interdisciplinary skills, tools, and techniques, and also of a science that has reached maturity in the 21st century (typified by Mode 2 or triple-helix notions of production (Etzkowitz & Leydesdorff, 2000), that is, research made in cooperation with multiple entities and institutions, such as academic, government, and corporate bodies). As an interdisciplinary social science with a growing degree of collaboration, LIS is a ripe field for investigating. Findings for this study will be useful for understanding the ways in which doctoral education does or does not prepare students for collaborative models of scholarly productivity. Assessment of the current state of education provides opportunities for implement policies and practices to improve this education.

3. Literature review

Research in the field of library and information science (LIS) has followed similar patterns of increased collaboration as other social science fields. In a study of information systems research, Cunningham and Dillon (1997) identified 62% of the research as collaborative. Ding, Foo, and Chowdhury (1998) found 48% of information retrieval research collaborative. Lipetz's (1999) evaluation of five decades of the *Journal of the American Society for Information Science* (JASIS) found that collaboration had increased to more than 50% in the most recent

publications. A subsequent study of JASIS&T (Liu, 2003) reinforced these findings.

Williams and Winston (2003) evaluated the type of collaboration that occurred with library science—particularly collaboration among academic librarians, LIS faculty members, and others. In the five library science journals they examined, they found that slightly less than half the articles were co-authored and that for every type of position analyzed, the authors were most likely to collaborate with a colleague in a similar position (librarians with librarians, faculty with faculty, etc.). Bahr and Zemon (2000) found similar patterns in their evaluation of the collaboration patterns of college and university librarians.

Overall, LIS shows a similar trend toward the social-science model of multiauthorship, with slightly more collaboration occurring in information science journals than the library science journals (Bahr & Zemon, 2000). The increased degree of co-authorship in the social sciences has led some to suggest that the social sciences should no longer be grouped with humanities scholarship in terms of publication models (Larivière, Gingras, & Archambault, 2005). This also may suggest that the social sciences are displaying a trend toward the Big Science model of productivity (Cronin, 2001b).

The dissertation itself, however, is often revered as a single-authored monograph in which the doctoral student displays originality and independent thinking: the Council of Graduate Schools declares the principles of independence and originality to be the cornerstone of the disserting experience (Isaac, Quinlan, & Walker, 1992). However, dissertation advisors often facilitate with "theory guiding the research, forming the research questions, designing the study, interpreting the results, or any other difficulties the student may encounter" (Bargar & Duncan, 1982, p. 19–20). This leads to the question of the degree of collaboration between advisor and advisees on the dissertation.

This idea of shared ownership and responsibility for the dissertation was tested in terms of topic selection in a study of faculty members and doctoral students from various disciplines. Isaac et al. (1992) asked faculty members and students to assess their degree of involvement in selecting dissertation topics from 1, the student alone makes the final selection, to 5, the adviser alone makes the final selection (p. 261). Although their findings show the variability between disciplines, the overall mean was 2.5 (from faculty) and 2.7 (from students), showing that although the responsibility for topic selection was on the student end of the continuum, both parties recognized the collaborative nature of the selection process.

Golde and Dore (2004) further investigated the degree to which students chose their dissertation topics and found large variances based on discipline. In their study of chemistry and English doctoral students, they found that 43.2% of the chemistry students and 95.6% of the English students agreed/strongly agreed that their dissertation topics were of their own choosing (p. 35). However, 28.9% of the English students reported that their dissertation research was done "in close collaboration with a faculty member" (p. 33) indicating that although they may have taken ownership for topic selection, there was a degree of collaboration present.

Another large disciplinary difference noted by Golde and Dore (2004) was the "dissertation as monograph" compared to the "dissertation as compilation." In their survey, 70.5% of the chemistry students reported that their dissertation would include work from several projects, while 82.5% of the English students reported that their dissertation would reflect the work of a single project (p. 29, 35). These findings may be in large part a reflection of the work environments of the two disciplines—the English students noted the library as the primary setting for their work and the chemistry students reported the laboratory as their primary setting (p. 29, 35). The potential for collaboration in these work setting may impact the type of work being conducted. For example, Ziolkowski (1990) noted that the expectations for dissertations in science and engineering disciplines have changed as the research model of these disciplines
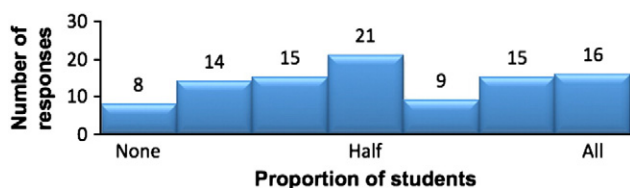
Fig. 1. Proportion of students with whom advisors had collaborated.

has moved toward larger research groups. As graduate students in the sciences work in a laboratory setting, with a research team under the direction of their advisor, the student's dissertation often emerges from the work of the laboratory (Isaac et al., 1992). In addition, much of the work forming the actual dissertation may be in the form of previously published work (often collaborative), thus blurring the boundaries again between the traditional definitions of independent and original work.

4. Procedures

The sampling frame for this study was a list of all faculty members from ALA-accredited schools in the United States and Canada. An initial list of these faculty members came from an online directory, validated using each school's website, and limited to include only full-time faculty members. From this initial sampling frame, two sub-populations were chosen for inclusion in the electronic questionnaire. The advisors ($n=374$) were defined as those tenured professors (at the rank of associate or full) from doctoral degree-granting ALA-accredited schools. It was assumed that these professors had the highest potential for serving as advisors to doctoral students. The advisees ($n=294$) comprised all assistant professor faculty members from any of the ALA-accredited schools described above. It was assumed that these faculty members were most recently in the doctoral process and would be best able to provide accurate reflections on their experiences. It should be noted that these faculty members represent one kind of "successful" doctoral experience—that is, they successfully completed their degrees and were hired to serve as faculty members in an ALA-accredited school. This study does not examine those who did not successfully graduate or those who did not become faculty members in these select schools. This is an acknowledged limitation of the study.

Two separate but parallel questionnaires were created using Qualtrics[3] software, one for the advisees and one for the advisors. The questionnaires were made electronically available and the link to the questionnaire was embedded in an e-mail message sent individually to all 648 potential respondents in January/February 2009.

Two hundred and fifteen people responded. The quantitative data were exported to Excel and SPSS for further analysis. In the case of the advisee surveys, only those respondents self-identifying as graduates from LIS programs were included in further analysis.[4] The open-ended questions from the questionnaires were exported to NVivo for analysis.

The final question on the questionnaires asked individuals if they would be willing to be contacted for a follow-up interview. Twenty-three advisees who had received degrees within the field of LIS (as identified in the questionnaire) and 33 advisors sent contact information, and these 56 faculty members were emailed individually

in March 2009 with a request to participate in a 30-min follow-up interview. The first 30 individuals to respond to the request were selected for the interview phase of the study (although these individuals were split equally between the advisor and advisees, no explicit stratification was done during recruitment/selection).

The phone interviews were conducted in April/May 2009, each lasting approximately 30 min. Participants were emailed 1 day before their scheduled interview and were given a list of themes that would guide the conversation. One of the themes discussed was the extent of collaboration in both the dissertation and products/activities outside of the dissertation.

Recordings of the interviews were imported into NVivo for transcription and analysis. Coding followed a mixed inductive and deductive approach. In terms of deductive coding, collaboration was chosen as one of a list of concepts around which to organize the verbal statements. In the inductive coding, "codes are suggested by the researcher's examination and questioning of the data" (Kelly et al., 2007, p. 1037). As these concepts arose out of the data itself, it required iterative listening and (re)coding of the recordings to ensure that each transcript was fully coded across all concepts. This process is complete when "saturation has been reached and all relevant utterances have been classified" (Kelly et al., 2007, p. 1037).

The data were organized in an Excel spreadsheet in which each column represented a distinct concept, each row represented a distinct participant, and each cell represented the relevant utterance. When writing up the results, all utterances in a column were evaluated, in order to provide a balanced report of the opinions and themes across all participants.

A separate subpopulation of the original list of faculty members from ALA-accredited schools was selected for inclusion in the bibliometric analysis phase of the study. Three criteria were required for inclusion in this phase of the study. In addition to meeting the original requirements, the faculty member must have (a) graduated from an ALA-accredited school, (b) a full dissertation available online (through ProQuest's *Dissertation and Theses Database*), and (c) a full and complete[5] CV available online. Ninety-seven faculty members met these criteria and were included in the bibliometric analysis phase of the study.[6]

CVs were searched in order to calculate the number of times the faculty member co-authored with their advisor or any member of their committee up to/before graduation and following graduation. Advisor and committee information came from the MPACT database.[7] Year of graduation was determined by the CV or from the dissertation itself. All information was entered into Excel for analysis.[8]

5. Results

5.1. Collaboration between advisors and advisees

The questionnaire asked advisors how many of their students they collaborate with (Fig. 1). More than 61% of the respondents reported collaborating with at least half of their advisees.

The question allowed idiosyncratic interpretation, so a follow-up question asked respondents to define collaboration by providing examples of instances of collaboration with advisees. The responses focused on publishing, researching, and presenting together. Teaching and grant work were mentioned to a lesser extent.

---

[3] www.qualtrics.com.

[4] In the original design of the study, it was hoped that survey results between ILS and non-ILS graduates could be compared. However, due to the low response rate of non-ILS graduates, this comparison was not possible.

[5] This excluded CVs that had not been updated in 2009 and that contained "selected" publication lists.

[6] Some limitations of this method were that individuals selected for the bibliometric analysis were not equally spread across years or schools.

[7] http://www.ils.unc.edu/mpact/.

[8] It should be noted that publication do not always indicate the time frame in which the work was completed—some activity happening in the pre-graduation phase could manifest itself later in the post-graduation phase as a publication.

Table 1
Proportion of students with whom advisors have collaborated on publications.

	None	–	–	Half	–	–	All
During student's doctoral work	14 (14%)	17 (17%)	14 (14%)	18 (18%)	12 (12%)	12 (12%)	11 (11%)
After the student graduated	28 (29%)	28 (29%)	11 (12%)	13 (14%)	8 (8%)	7 (7%)	0 (0%)

Note: The dashes between the anchor words denote that the option was blank on the questionnaire; shading denotes plurality of responses for each question.

Table 3
Number of co-authored publications with advisors and committee before and after graduation.

	Mean number of publications	Standard deviation	Min	Max	Median
Advisors—before	1.74	4.11	0	23	0
Advisors—after	0.93	2.01	0	12	0
Committee—before	1.62	3.66	0	18	0
Committee—after	1.63	8.32	0	79	0

Table 4
Number of dissertations by number of citations to self, advisor, and committee.

Number of times cited		0	1	2	3	4	5	6	7	8	9	10	11+
Type of citation	Self-citation	44	18	13	8	5	2	2	1	1	1	1	1
	Citations to advisor	38	17	12	6	7	3	2	5	3	0	1	3
	Citations to committee	24	19	14	7	6	4	2	4	2	4	4	4

Note. Total for citations to committee is 94, due to the removal of three dissertations with no committee information.

Fifty-eight percent of advisees ($n = 42$) indicated they collaborated with their advisor during their doctoral program. The descriptions of collaboration focused on research projects, joint publications, and co-presentations. Five respondents indicated they considered the help they received on their dissertation to be a form of collaboration. A few respondents noted collaborations on teaching and course creation, grant writing, and advising other students together.

Interviews probed more deeply into the nature and purpose of advisor/advisee collaborations in the doctoral process. Some advisees described how they progressed through various stages of the research process as a collaborator. One recalled that at the beginning, "the only thing I really did was I handled the statistics… there were times I felt like I was a drone" (ID42). However, once she began writing articles, she "felt like [she] was a co-author" (ID42). An advisor noted that he collaborates with students if their interest areas align and feels that part of the experience is getting them to feel more confident about doing research by allowing them to experience the research process (ID415). An advisee reinforced this idea of an advisor helping the student learn how to do research through collaborations saying that the advisor "should have a leading role at the beginning stage", but once the student has been studying for multiple years and knows "the research style, the research problem, [and] the research domain", then "the role can be balanced" (ID116).

One advisor explained how she brings students with her to conferences to allow them a "safe environment" in which they can practice presenting their research. She noted that she never asks them to do her topics but guides them in the exploration of their own topics (ID575). Another advisor similarly noted publishing with a student and taking them to conferences, calling collaboration a "kind of mentorship" (ID478). The advisor, who was preparing the student to take his position, noted that there was more to the mentorship "than technically how to do the research," that mentoring was teaching the student the "job of a university professor" (ID478).

Another advisee explained the role modeling provided by her advisor: "He just sees research opportunities; he knows how to set up a research question that can be answered" (ID246). She recalled, "he would give me advice about how to make a research question and… what kinds of data answers that question and how to present it and how to figure out how to write a conference paper as opposed to a journal paper" (ID246).

Advisors described the mutual benefits of collaborative relationships. One respondent noted: "as a researcher, as a faculty member, you need to work with those students, because it's a give and take relationship—it keeps you going because they teach you things" (ID160). Another stated: "I manage to keep in touch with my scholarship through my students" (ID506), and "I like to do collaborative research—I just find it much more rewarding than trying to do something on my own, partly because of the discipline imposed on your team members in getting things done" (ID497). Another advisor reinforced this, saying collaboration with doctoral students was both "intellectually stimulating" and "it helps keep you on track" (ID488). One advisor noted the need to teach students how to collaborate saying, "I think once they get out they are going to be increasing[ly] collaborative scholars; I think the idea of information silos is disappearing, particularly in our field where our strength really lies in working with other people" (ID495).

5.1.1. Co-publishing between advisors and advisees

An additional question explored publication practices as a specific form of collaboration, asking advisors how many of their advisees they publish with, both during the student's doctoral career and after.

More than 50% of advisors indicated that they published with at least half of their advisees during the doctoral process. Less than 30% indicated that they published with at least half of their advisees after the student graduated. However, in both cases, the dispersion tended toward non-collaboration (Table 1).

Advisees were asked a similar question on whether or not they published with their advisor during their doctoral program or after graduation. The majority of doctoral students did not indicate publishing with their advisor during their doctoral program in either time period (56% during; 69% after), although more indicated publishing with their advisor during than after their program (Table 2).

Co-authorship was examined unobtrusively by examining the number of publications (as listed on the CV) before and including

Table 2
Number of instances of co-authorship with advisor and committee before and after graduation.

		Number of instances of co-authorship	0	1	2	3	4	5	6	7	8	9	10	11+
Type of dissertation member with whom student collaborated	Advisor	Before	57	18	5	5	1	4	0	1	1	0	0	5
		After	65	16	5	2	1	0	4	0	0	0	0	1
	Committee members[a]	Before	62	11	5	4	1	1	2	0	0	4	0	4
		After	64	16	5	2	3	1	0	0	0	0	0	3

[a] Exclusive of advisor(s).

Table 5
Descriptive statistics regarding number of citations to self, advisor, and committee.

	Mean	Standard deviation	Min	Max	Median
Self-citations	1.68	2.75	0	19	1
Citations to advisor	2.28	3.06	0	14	1
Citations to committee	3.07	3.40	0	12	2

the year the dissertation was defended and after.[9] Collaborative authorship was examined in terms of both advisee–advisor collaborations and advisee–committee member collaborations.

About 41% co-authored with their advisor at least once up to and before graduation and about 31% co-authored with their advisor at least once after graduation. About 34% co-authored with at least one committee member at least once up to and before graduation, and about 32% co-authored with at least one committee member at least once after graduation (Table 3).

5.1.2. Distributed cognition

An additional aspect of analysis was the degree to which the intellectual products of the advisor and committee members influenced the dissertation, as shown through citations. This was considered a passive form of collaboration, in which the individuals are not explicitly collaborating, but the intellectual influence of the advisors and committee members is demonstrated through citations. This analysis grouped dissertations by the number of times they self-cite (the author of the dissertation citing one of their previous published works), cite their advisor, or cite at least one committee member (exclusive of the advisor).

Fifty-five percent of dissertation authors cited themselves at least once, 61% cited their advisor at least once, and 75% cited at least one committee member at least once. On average, dissertation authors cited themselves 1.68 times, cited their advisor 2.28 times, and cited members of their committee 3.07 times[10] (the median for self-citations and citation to advisors was 1; the median number of citations to a committee member was 2) (Tables 4–5).

5.1.3. Collaboration with other individuals

Some respondents indicated that they collaborated with other faculty members and students during and after their doctoral program. One respondent noted that she collaborated (and continues to collaborate) on a study with another committee member with whom her interest areas were more aligned than her advisor (ID2). Other advisees recalled engaging in "cross-collaborations" with students and other faculty members that grew out of a grant project on which they were all working (ID74). One advisee indicated that she did not collaborate during her program but now collaborates with former doctoral student colleagues (ID175).

Another advisee described the experience of collaborating with other doctoral students during the program as "kind of key" (ID69). However, most respondents commented on more informal collaborations or relationships that served as forms of peer mentoring. Informal collaborations were mentioned by multiple respondents, one stated: "we worked together more like on ideas, you know; we didn't really work together on projects so much, but we… constantly got to bounce around ideas about what we were going to do" (ID217). Another respondent also recalled setting up meetings for doctoral students to collaborate on "ideas" rather than projects (ID575).

5.1.4. Dissertations as collaborations

In order to further assess the degree of collaboration on the dissertation itself, respondents were asked in the questionnaire what

Table 6
Advisors' perceptions of contributions to the dissertation.

Question	Entirely the student			Equal involvement			Entirely the advisor	Mean
Conception	3	34	22	30	5	4	0	3.12
Design	1	18	31	36	9	3	0	3.44
Data collection	47	32	11	3	2	3	0	1.88
Analysis	21	36	22	13	3	3	0	2.49
Interpretation	9	30	36	14	6	2	1	2.88
Drafting	48	23	17	6	3	1	0	1.94
Revising	6	20	31	22	13	5	1	3.36
Reviewing the final draft	0	7	4	22	23	24	18	5.09
Approving the final draft	0	3	2	3	11	20	58	6.24

*Note: mode is highlighted.

the typical involvement was between the advisor and advisee on a series of tasks involved in writing the dissertation. Tables 6 and 7 display the results where 1 = entirely the student, 4 = equal involvement, and 7 = entirely the advisor (the values between these anchors were left blank on the questionnaire).

As is shown, all tasks averaged on the "entirely the student" end of the scale in both sets of responses, except reviewing and approving the final draft. However, for all items, it appears that each set of respondents overestimates their contribution. For example, advisor responses were all closer to "entirely the advisor" end of the continuum than advisee responses. The ranking of the items was fairly similar between the two, except in the cases of interpretation and approving the final draft.

Advisors and advisees were also asked how often they would consider significant work by a colleague (on publications outside of doctoral work) as grounds for authorship on a publication, where 1 = never, 2 = sometimes, 3 = often (Tables 8 and 9).

The two items that were closest to "entirely the advisor" in Tables 6 and 7 were the two that had the lowest scores in terms of inclusion for authorship, perhaps indicating that the contributions made by the advisor on the dissertation itself would not be considered sufficient grounds for co-authorship in another communicative genre.

Advisees were asked to indicate whether they have published or planned to publish the work from their dissertation. Ninety-six percent of respondents (n = 69) indicated that they had published or planned to publish the work from their dissertation. Advisees were then asked whether or not they did (or would) list their advisor as a co-author on these publications. Seventy-eight percent (n = 54) of respondents indicated that they did not intend or had not included their advisor as a co-author. When asked to state the reasons they chose to include or not to include their advisor on the dissertation, the overwhelming majority of those choosing not to include the advisor stated simply that the dissertation was their work, not their advisors' (n = 43). Other reasons for not including their advisor were, the

Table 7
Advisees' perceptions of contributions to the dissertation.

Question	Entirely the student			Equal involvement			Entirely the advisor	Mean
Conception	27	28	9	5	1	1	0	1.99
Design	16	17	25	11	1	1	0	2.54
Data collection	49	14	6	1	2	0	0	1.51
Analysis	40	20	6	5	1	0	0	1.71
Interpretation	37	21	10	3	1	0	0	1.75
Drafting	37	20	8	6	1	0	0	1.81
Revising	12	19	20	15	3	3	0	2.82
Reviewing the final draft	1	11	13	23	10	9	5	4.07
Approving the final draft	0	5	3	18	10	18	18	5.21

*Note: mode is highlighted.

---

[9] All publication types on the CV were included in this analysis.
[10] This calculation was the average number of times any member was cited, not how many times an individual committee member was cited.

Table 8
Advisors' criteria for authorship.

| Question	Never	Sometimes	Often	Mean	SD
Conception	8	37	48	2.43	0.65
Design	11	29	53	2.45	0.70
Data collection	8	30	54	2.50	0.65
Analysis	6	24	63	2.61	0.61
Interpretation	6	29	58	2.56	0.62
Drafting	9	25	59	2.54	0.67
Revising	15	41	37	2.24	0.71
Reviewing the final draft	35	35	22	1.86	0.78
Approving the final draft	32	30	25	1.92	0.81

*Note: mode is highlighted.

Fig. 2. Proportion of students with whom an advisor was listed as a co-author on dissertation-related publications.

"advisor would not expect to be included," and the "advisor said not to." The majority of those who included their advisor felt that their advisor had made significant contributions ($n = 7$). Other reasons for inclusion included "common practice in the field" and "as a courtesy."

As a point of comparison, advisors were asked whether or not they were included as a co-author on publications that resulted from the student's dissertation. They selected responses on a seven-point scale, with 1 indicating that none of their students had ever included them as a co-author on publications coming out of the dissertation and 5 indicating that all of their students included them as a co-author on these manuscripts. Forty-two percent of advisors indicated that none of their students included them as a co-author, and 3% indicated that they were always included (Fig. 2).

Interview respondents were also queried about the extent to which the dissertation itself could be considered a collaborative product. Similar to the questionnaire results, many respondents indicated that the dissertation was the advisee's work (ID415), with a focus on the dissertation being a demonstration of an ability to conduct independent research (ID221). Many advisees simply explained that "my dissertation was mine" (ID234), or "I felt like [my dissertation] was pretty much all mine" (ID217). One advisee explained: "As far as the dissertation itself, it was not collaborative… and my advisor made this very clear from… the beginning… my committee members said, 'By the end of this process you should know more about these particular items than any of us do'… Their role was very much guidance, advice, but when it came down to what I did and what I decided to do and what I wanted to do it was my work and my product" (ID2). Another advisee described an experience in which he had personally obtained external funding for his dissertation work: "This was very much initiated by me… it was very much driven by me with, I would actually say, minimal input from my advisor and the rest of the committee" (ID74). One respondent noted the benefits of doing this independent work, saying, "I really wanted to have the experience of doing it myself, because that's what I would be doing as a faculty member" (ID234).

Some respondents indicated there were various degrees of collaboration that occurred during the dissertation process. One advisor described the editing he does as a form of collaboration,

Table 9
Advisees' criteria for authorship.

Question	Never	Sometimes	Always	Mean	SD
Conception	6	37	28	2.31	0.62
Design	3	37	31	2.39	0.57
Data collection	3	32	36	2.46	0.58
Analysis	1	28	42	2.58	0.53
Interpretation	2	27	42	2.56	0.55
Drafting	4	25	42	2.54	0.61
Revising	7	43	21	2.20	0.60
Reviewing the final draft	22	36	13	1.87	0.70
Approving the final draft	26	33	12	1.80	0.71

*Note: mode is highlighted.
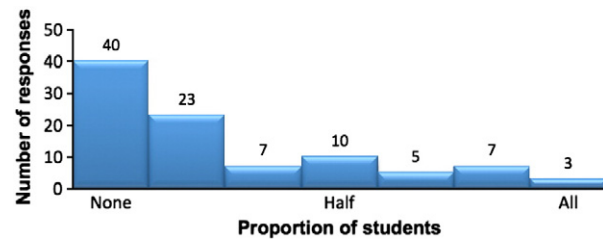
saying that a "little collaboration goes on a lot," but stated that in the end, it was her advisee's work and ideas (ID398). Another advisee also noted the contribution of editing, saying that "probably the only way it was collaborative was through the editing process" (ID42).

Multiple respondents noted guidance as collaboration. One advisee noted that while she "did not feel that the outcome was collaborative," she received "really good guidance" (ID234). Another advisee explained that her faculty "have a very heavy hand in guiding the direction of the research and the questions that were being asked" but differentiated that guidance from collaboration, saying, "I don't mean collaborative in the sense of we all worked on writing it together, but a more firm sort of guidance" (ID153). Another advisee noted the heavy presence of her advisors in her dissertation: "I think that in a way your dissertation is really not your own work, because it is so heavily directed by your committee" (ID155). However, she went on to note that her committee explicitly told her that anything published out of the dissertation should not list them as co-authors.

In only one case did a respondent describe a truly collaborative dissertation model at her institution, "where students work together on a dissertation—each one doing their own dissertation, but they are working together" (ID622). This respondent noted that she has not implemented this yet but is "taking a look at it" (ID622).

5.1.5. Academic models and funding

As with other conversations about collaboration, grant funding came up again as a situation in which a student may have collaborative opportunities that may lead to dissertation work. However, while respondents noted that grant-funded projects may create a collaborative "problem space" (ID153) in which the advisors and advisees work, the dissertation itself should not be collaborative. One advisor described his experience working with students on a grant project, explaining that "for the most part, because they have often worked on projects on my research agenda, they end up doing research not specifically in my area but at least related enough that there's an overlapping of interests on my part with what they want to do" (ID499). The advisor explained how he "guided them to think about the research problem area" but that "it's still not the same as the natural science model because they're not actually taking a piece of my work, of our project work, to do their dissertation on, but rather it's sort of like a jumping off point of an interesting and probably vital area to do research in and kind of, based on their experience in the project, being able to pursue research in one of these areas" (ID499).

An advisee described his experience working on a grant with his advisor as a "win–win kind of situation" in which he and his advisor "were able to identify a particular project where we could both make some progress on the research ideas and things that we wanted to move forward on from our own perspective and be able to start to have that kind of mentor–mentee and research partner kind of relationship. Even though the different aspects of that project that we worked on were quite different, there was some common ground on that one particular project that helped us start to build that relationship and start to move forward toward my dissertation trajectory" (ID74).

The concept of funded research led to the idea of working within different academic models. One advisor noted that having research grants was "the best model" and that she saw LIS "moving away from the old model of the solitary research to one that is more communal… I think that as we all become more dependent on grant funding… we'll be moving more towards that Big Science model or at least medium-sized science model" (ID488). These sentiments were echoed by other respondents, one calling the "hard-science model" "the way of the future" (ID506) and another calling "funded grant research" "ideal" (ID507).

However, not all respondents were as supportive of this model. One respondent commented, "I don't agree with the model, that sort of medical science model, that you come in and take a piece of someone else's research and, you know, do that little bit and then move on to get your Ph.D.… It takes away one of the most profound aspects, in my mind, of PhD work, which is coming up with an idea… that is fascinating enough that you want to spend the rest of your life examining pieces of it" (ID495). Another advisor recalled his own experience working in the "humanities model" noting: "It… really pushed into us that this is independent research, you know, that your chair or advisor is there to help, but not necessarily be on top of you. And your committee is there to provide whatever expertise they have to help you move forward" (ID499). In closing, the advisor defended the model of creating a team-based approach in which many students approach the same problem space but are doing independent dissertations saying that forcing the students to "grapple with 'What's the research problem here? What's the research question?'" He commented that this was a critical component of doctoral education, stating that his "intuition tells me that that can serve as a better approach [instead of the natural science model] for developing really good independent researchers" (ID499).

Many respondents noted that both models currently exist in LIS and expressed a desire for the field to continue to support multiple models: "I'm hoping we always have both, because I think there's value in both. I don't really see the [humanities] model working, the advisee-driven model working as well, in, say, areas of information retrieval or some of the more computer science sections of our field; I think it's harder in part because people are kind of constrained by the machine" (ID398). The respondent ended by commenting that "both have something to contribute" (ID398). Another respondent reinforced this, saying, "What I hope is that we continue to support a wide variety of research styles, because I think that it's healthy. I think that our students are better off because they are exposed to all kinds of different research styles" (ID622). Another respondent said, "I think our field will always have a diversity" (ID641).

The desire to keep multiple models was noted by another respondent who said that the topic interests of doctoral students at his institution were "skewed" to represent the better funded areas. He stated that he "would like to see a broader diversity of doctoral students" and noted the dilemma produced by grant funding: "The question comes, do you, by having the student on your grant, do you bring them in to do your research, which makes sense. But intellectually and pedagogically, I think is counterproductive and that, I think is going to be a bind that the faculty will have to wrestle with" (ID495). One respondent, noting that "not all areas of research in information and library science are funded" said, "I hope we never narrow down to the point where we only give support for people who are on funded projects" (ID497). Another respondent mentioned a particular example, saying, "working on libraries is something that is not appealing for funding" (ID378).

6. Discussion

Triangulation between the questionnaire and bibliometric data on collaboration shows strong similarities; regarding collaborative authorship, these findings show rates between advisees and advisors only slightly lower than results of previous studies of co-authorship in LIS. Further evidence is needed to ascertain whether those advisors who collaborate with students are more or less collaborative on the whole and whether advisees who collaborate during their doctoral studies have a higher proclivity for collaboration later in their career. Future studies may also consider the effect on future productivity in those fields where collaborative dissertations are the norm.

Data from the interviews suggest that a strong component of paradigm shaping (Kuhn, 1996) occurs in the course of these collaborative relationships, in which students are exposed to the normative structure of the field and how to communicate in it. One student noted that he learned "the research style, the research problem, [and] the research domain" (ID116) through collaborations. Another advisee recalled learning "how to make a research question and… what kinds of data answers that question and how to present it and how to write a conference paper as opposed to a journal paper" (ID246). These examples epitomize the importance of collaboration in teaching doctoral students how to conduct research and how to engage in the communicative genres of the discipline. Although advisors can provide this support in other ways, collaborative research may functions as a critical method for imparting the norms and expectations of the discipline (Girves & Wemmerus, 1988). Collaborations also seemed to provide a gateway for networking opportunities; many respondents noted being introduced into the scholarly community through conferences where they presented or copresented with their advisors. These collaborations provide the student with the opportunity to meet other scholars and engage in the wider scholarly conversation.

Although other manifestations of collaboration between advisees and faculty members were mentioned (such as teaching), collaboration in the doctoral process was primarily understood as research. This corresponds to the interview respondents' comments on the function of LIS doctoral education—that is, to develop strong researchers (Sugimoto, 2010). The primary focus on developing researchers, rather than developing strong teachers or administrators, seemed evident in the examples of collaboration.

Multiple respondents noted that they engaged in "idea sharing" with their doctoral student colleagues. Although these exchanges did not often materialize into formal collaborations, this seemed to be an important aspect and benefit of a strong doctoral student community. The ability to "idea share" within a safe network of peers may provide students the space in which to develop their own sense of competence and identity. As LIS doctoral students bring with them a diverse range of experiences and educational backgrounds (especially considering the low number of undergraduate degrees within the field), idea sharing may provide a place where interdisciplinary lenses can be introduced to doctoral students' research projects. The role of doctoral student colleagues in the intellectual development of their peers needs further examination, particularly with the rise of distance education.

One of the research questions driving this study was the extent to which the dissertation itself could be seen as a collaborative product and whether the same process, in another genre, would be considered co-authorship. Data from the questionnaire and interviews suggest that the dissertation is not and should not be considered a collaborative product. The respondents saw the dissertation as predominately advisee-driven, with guidance and support from the dissertation committee. In addition, the majority of respondents did not believe the advisor should appear as an author on any publications directly resulting from the dissertation. The dissertation stood apart as the single demonstration of the student's ability to conduct independent research, therefore qualifying them for graduation.

Furthermore, many of the advisors noted that there was not an exact match between the dissertation research of the student and their own research. Instead, many respondents talked about a "shared problem space" in which the advisor and the advisees of that advisor

were all working in similar, yet nonidentical research areas. In interview discussions, respondents reported a continuum of disciplinary models, bounded at one end by the humanities model and at the other end by the laboratory model. The repeated conception of the "shared problem space" may be an indication this represents a third model—that of the social science model—in which students' work may be connected by a shared lens, even while they engaged in very distinct projects. The ability to share a lens, but not a research project, may increase the ability to engage in interdisciplinary or possibly interparadigmatic approaches and analysis. The characteristics of what defines a social science model, and how this model is practiced across other social science disciplines, beg further investigation.

In the formalized collaborations between the advisee and the advisor and committee members, many respondents stressed the students' ability to engage in their own research, rather than to conduct research that fulfilled their advisor's or committee members' particular research agenda. Doctoral students are encouraged and expected to conduct research and begin developing their own individual research agenda during the course of their study, even when engaged in collaborations, and are, in many respects, considered to be junior colleagues. Future research is necessary to evaluate how this may differentiate LIS from other disciplines, particularly those in which the laboratory model is more structured and plays a larger role in dictating students' research projects. This will be especially important as we consider the impact of the Big Science movement and the growing importance of grant funding on the field of LIS. In considering our current paradigm, we must examine whether the importation of certain characteristics of the Big Science model will dramatically change the way in which we do science and, if so, if that change is beneficial.

Many respondents indicated a positive attitude toward grant funding—believing it would serve a double function of allowing the students to be in-residence and devoted to research. However, grant writing is among the least frequently discussed and the least sufficiently discussed item between advisors and advisees (Sugimoto, 2010). Faculty members seem to have realized a value and potential in moving toward this model of scholarship but have not yet engaged in work practices that reflect this move. Many of the advisees interviewed felt that they were at a great disadvantage when they began their careers because they were expected to generate grants but had not received any instruction on how to do so. If the field of LIS decides to move in this direction, it will be imperative to educate future faculty at the doctoral level, rather than waiting until they are in the midst of their pretenure career, to understand the mechanics of the grant writing/application process.

Future research needs to be done to examine how LIS perceptions of the dissertation and the doctoral process relate to other social science disciplines. These comparisons could lead to a better understanding of the social science model. In addition, this research calls for a deeper examination of the Big Science model of productivity and the implications for the field.

7. Conclusion

The doctoral process was largely seen to be a research-driven process, and collaborations within this space were predominately seen as those activities of joint scholarly production. Respondents indicated how rich these environments were for the students to learn how to do research. However, although some students received this type of experience, many did not. Those students not exposed to research through collaborations may be at a disadvantage to students who are provided this opportunity. As one respondent said, collaboration is a "kind of mentorship," and more students may require this type of mentorship as scholarship transitions into more collaborative models of productivity. Some faculty may argue that they do not do the type of scholarship that lends itself to collaboration. However, many advisees

noted how they learned through role modeling; mere observance of how their advisor conducts science can be a powerful learning experience. Faculty members should consider ways in which they can include their students in research design and practice, even if their study is not particularly collaborative.

Collaborations also occurred with committee members and faculty not involved with the student's dissertation. These experiences can provide the student with multiple research lenses, as each faculty member may approach questions with different methods. Some doctoral programs facilitate these experiences programmatically, by requiring students to take multiple research practica, each with a different faculty member. Respondents also noted the critical function of idea sharing with doctoral student colleagues. This may also be an area that can be formally facilitated, by creating seminars or other required forums, or informally, through the creation of doctoral student spaces.

Lastly, the dissertation is still seen as a single-authored monograph with respondents conceptualizing it as the indication of a student's ability to do independent research. However, it may be argued that the product required of the student for completion of the degree does not actually match the products or modes of production that will be required from the student post-degree. We are, rather, requiring a product of 19th century science from scholars who we expect to contribute to 21st century science. If we continue to rely on this as the standard rite for passage into the community of doctorates, we must consider how it serves as a process to teach students the skills and techniques they will need to be innovative scientists. If the dissertation does not function to teach these skills to students, we may want to rethink our approach to doctoral education.

References

Ashford, S. J. (1996). Working with doctoral students: Reflections on doctoral work past and present. In P. J. Frost, & M. S. Taylor (Eds.), *Rhythms of academic life: Personal accounts of careers in academia* (pp. 153−158). Thousand Oaks, CA: Sage Publications.

Bahr, A. H., & Zemon, M. (2000). Collaborative authorship in the journal literature: Perspectives for academic librarians who wish to publish. *College & Research Libraries*, 61, 410−419.

Bargar, R. R., & Duncan, J. K. (1982). Cultivating creative endeavor in doctoral research. *The Journal of Higher Education*, 53(1), 1−31.

Borgman, C. L. (2007). *Scholarship in the digital age.* Cambridge, MA: MIT Press.

Busch, J. W. (1985). Mentoring in graduate schools of education: Mentors' perceptions. *American Educational Research Journal*, 22(2), 257−265.

Cameron, S. W., & Blackburn, R. T. (1981). Sponsorship and academic career success. *Journal of Higher Education*, 52, 369−377.

Cronin, B. (2001a). Acknowledgement trends in the research literature of information science. *Journal of Documentation*, 57, 427−433.

Cronin, B. (2001b). Hyperauthorship: A postmodern perversion or evidence of a structural shift in scholarly communication practices? *Journal of the American Society for Information Science and Technology*, 52, 558−569.

Cronin, B. (2004). Bowling alone together: Academic writing as distributed cognition. *Journal of the American Society for Information Science and Technology*, 55, 557−560.

Cronin, B., McKenzie, G., & Rubio, L. (1993). The norms of acknowledgement. *Journal of Documentation*, 49, 29−43.

Cronin, B., Shaw, D., & La Barre, K. (2003). A cast of thousands: Co-authorship and subauthorship collaboration in the 20th century as manifested in the scholarly journal literature of psychology and philosophy. *Journal of the American Society for Information Science and Technology*, 54, 855−871.

Cronin, B., Shaw, D., & La Barre, K. (2004). Visible, less visible, and invisible work: Patterns of collaboration in 20th century chemistry. *Journal of the American Society for Information Science and Technology*, 55, 160−168.

Cunningham, S. J., & Dillon, S. M. (1997). Authorship patterns in information systems. *Scientometrics*, 39(1), 19−27.

Ding, Y., Foo, S., & Chowdhury, G. (1998). A bibliometric analysis of collaboration in the field of information retrieval. *International Information & Library Review*, *30*, 367—376.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From national systems and "mode 2" to a triple helix of university–industry–government relations. *Research Policy*, *29*(2), 109—123.

Fox, M. F. (1983). Publication productivity among scientists: A critical review. *Social Studies of Science*, *13*(2), 285—305.

Garfield, E. (1982). The ethics of scientific publication: Authorship attribution and citation amnesia. *Essays of an Information Scientist*, *5*, 622—626.

Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. *The Journal of Higher Education*, *59*(2), 163—189.

Golde, C. M., & Dore, T. M. (2004). The survey of doctoral education and career preparation. In D. H. Wulff, & A. E. Austin (Eds.), *Paths to the professoriate: Strategies for enriching the preparation of future faculty* (pp. 19—45). San Francisco: Jossey-Bass.

Goldfinch, S., Dale, T., & DeRouen, K. (2003). Science from the periphery: Collaboration, networks and 'periphery effects' in the citation of New Zealand Crown Research Institutes articles, 1995–2000. *Scientometrics*, *57*, 321—337.

Gordon, M. D. (1980). A critical reassessment of inferred relations between multiple authorship, scientific collaboration, the production of papers, and their acceptance for publication. *Scientometrics*, *2*, 193—201.

Green, S. G., & Bauer, T. N. (1995). Supervisory mentoring by advisers: Relationship with doctoral student potential, productivity, and commitment. *Personnel Psychology*, *48*, 537—561.

Harsanyi, M. A. (1993). Multiple authors, multiple problems: Bibliometrics and the study of scholarly collaboration: A literature review. *Library & Information Science Research*, *15*, 325—354.

Hart, R., Carstens, T., Lacroix, M., & May, K. R. (1990). Funded and nonfunded research: Characteristics of authorship and patterns of collaboration in the 1986 library and information science literature. *Library & Information Science Research*, *12*, 71—86.

Haythornthwaite, C. (2006). Learning and knowledge networks in interdisciplinary collaboration. *Journal of the American Society for Information Science and Technology*, *57*, 1079—1092.

Heffner, A. G. (1979). Authorship recognition of subordinates in collaborative research. *Social Studies of Science*, *9*(3), 377—384.

Heffner, A. G. (1981). Funded research, multiple authorship and subauthorship collaboration in four disciplines. *Scientometrics*, *3*, 5—12.

Hernon, P., Smith, A., & Croxen, M. B. (1993). Publication in *College and Research Libraries*: Accepted, rejected, and published papers, 1980–1991. *College & Research Libraries*, *54*, 303—321.

Isaac, P.D., Quinlan, S.V., & Walker, M.M. (1992). Faculty perceptions of the doctoral dissertation. *The Journal of Higher Education*, *63*(3), 241–268.

Jacobi, M. (1991). Mentoring and undergraduate academic success: A literature review. *Review of Educational Research*, *61*, 505—532.

Kelly, D., Wacholder, N., Rittman, R., Sun, Y., Kantor, P., Small, S., & Strzalkowski, T. (2007). Using interview data to identify evaluation criteria for interactive, analytical question answering systems. *Journal of the American Society for Information Science and Technology*, *58*, 1032—1043.

Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd ed.). Chicago: University of Chicago Press.

Larivière, V., Gingras, Y., & Archambault, E. (2005). Canadian collaboration networks: A comparative analysis of the natural sciences, social science and the humanities. *Scientometrics*, *68*, 519—533.

Lawani, S. M. (1986). Some bibliometric correlates of quality in scientific research. *Scientometrics*, *9*, 13—25.

Lipetz, B. A. (1999). Aspects of *JASIS* authorship through five decades. *Journal of the American Society for Information Science*, *50*, 994—1003.

Lipschutz, S. S. (1993). Enhancing success in doctoral education: From policy to practice. In L. L. Baird (Ed.), *Increasing graduate student retention and degree attainment: New directions for institutional research, No. 80* (pp. 69—80). San Francisco: Jossey Bass.

Liu, J. (2003). A bibliometric study: Author productivity and co-authorship features of JASIST 2001–2002. *Mississippi Libraries*, *67*, 110—112.

McCain, K. W. (1991). Communication, competition, and secrecy: The production and dissemination of research-related information in genetics. *Science, Technology, & Human Values*, *16*, 491—516.

Merton, R. K. (1973). *The sociology of science: Theoretical and empirical investigations.* Chicago: The University of Chicago Press.

Oromaner, M. (1974). Collaboration and impact: The career of multi-authored publications. *Social Science Information*, *14*(1), 147—155.

Pao, M. L. (1982). Collaboration in computational musicology. *Journal of the American Society for Information Science*, *33*, 38—43.

Patel, N. (1973). Collaboration in the professional growth of American sociology. *Social Science Information*, *12*(6), 77—92.

Presser, S. (1980). Collaboration and the quality of research. *Social Studies of Science*, *10* (1), 95—101.

Price, D. J. de. S. (1963). *Little science, big science.* New York: Columbia University Press.

Price, D. J. de. S. (1981). Multiple authorship. *Science*, *212*(4489), 986.

Price, D. J. de. S., & Beaver, D. (1966). Collaboration in an invisible college. *American Psychologist*, *21*, 1011—1018.

Reskin, B. F. (1977). Scientific productivity and the reward structure of science. *American Sociological Review*, *42*(3), 491—504.

Smart, J. C., & Bayer, A. E. (1986). Author collaboration and impact: A note on citation rates of single and multiple authored articles. *Scientometrics*, *10*, 297—305.

Sonnenwald, D. H. (2007). Scientific collaboration. In B. Cronin (Ed.), *Annual review of information science and technology* (pp. 643—681). Medford, NJ: Information Today.

Sugimoto, C.R. (2010). *Mentoring, collaboration, and interdisciplinarity: An evaluation of the scholarly development of Information and Library Science doctoral students* (Unpublished doctoral dissertation, University of North Carolina at Chapel Hill).

Syrett, K. L., & Rudner, L. M. (1996). Authorship ethics. *Practical Assessment, Research & Evaluation*, *vol. 5,(1)*, Retrieved from http://PAREonline.net/getvn.asp?=5&n=1.

Williams, J. F., & Winston, M. D. (2003). Leadership competencies and the importance of research methods and statistical analysis in decision making and research and publication: A study of citation patterns. *Library & Information Science Research*, *25*, 387—402.

Ziolkowski, T. (1990). The Ph.D. squid. *The American Scholar*, *59*, 177—195.