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CAIS Paper: Does advisors' disciplinary background affect LIS doctoral students' publishing productivity and quality?

Abstract: The purpose of this study is to investigate LIS doctoral students' publication since the 1960s and measure the impact of LIS doctoral advisors' disciplinary background on their publication productivity and quality. After analyzing the LIS doctoral graduates' publications since the 1960s, we found that LIS doctoral students supervised by advisors with non-LIS background publish more research that is cited more often.

Résumé:

Keywords: LIS, doctoral student, advisor, interdisciplinary, publications

1. Introduction

Scholars are under pressure to publish throughout their academic career, and doctoral students feel this pressure before entering academia. Although publishing is not a mandatory requirement of most doctoral degrees, doctoral students contribute a third of scientific publications (Larivière, 2010, 2012) to build their CV (Hatch & Skipper, 2016) and prepare their future research (Horta & Santos, 2016). Doctoral graduates must demonstrate their ability to conduct independent research (Hatch & Skipper, 2016; Johnson, 2009; O'Connor & Park, 2001) but it is not clear how advisors' disciplinary background affect student's publishing productivity and quality. Previous studies show that most doctoral students do not receive adequate support to publish their research (Dinham & Scott, 2001; Engstrom, 1999), and Kamler (2008) reports that co-authorship with advisors can improve doctoral students' publishing competency but this support varies across disciplines. It is reported that LIS doctoral advisors' disciplinary background influences the interdisciplinarity of their student's research topics (Shu, Larivière, Mongeon, Julien, & Piper, 2016; Sugimoto, Ni, Russell, & Bychowski, 2011) but we don't know whether it also affects their students' publishing behaviour. The purpose of this study is to investigate LIS doctoral students' publication since the 1960s and measure the impact of LIS doctoral advisors' disciplinary background on their publication productivity and quality.

2. Literature Review

Previous studies indicate that publishing should play a crucial role in doctoral education to prepare students to enter academia (Kamler, 2008; Lee & Kamler, 2008) because publishing during their doctoral studies has a positive impact on their future research performance (Horta & Santos, 2016; Larivière, 2012). However, Dinham and Scott (2001) reveal that doctoral students receive inadequate publishing mentoring from their advisors, and co-authorship with advisors could play a key role in doctoral students' publication productivity (Kamler, 2008).

Research collaboration between doctoral students and their advisors has been explored by Kyvik and Smeby (1994) who report a positive correlation between the numbers of graduate students that faculty supervises and their own research productivity. Liang, Liu and Rousseau (2004) investigate author name order of student-advisor co-authorship while Liang and Liu (2005) explore the distribution of student-advisor co-authorship before and after students' graduation. Mählck & Persson (2000) map the intra department bibliometric network to show the interactions between advisors and doctoral students.

Prior works report that LIS doctoral advisors' disciplinary background influences the interdisciplinarity of their student's research topics. For example, Sugimoto, Russell, and Grant (2009) reveal a radical change in the interdisciplinarity of LIS doctoral advisors while Sugimoto, Ni, Russell, and Bychowski (2011) indicate that the disciplinary background of LIS advisors has an effect on the interdisciplinarity of the LIS doctoral dissertation. Based on an analysis of all LIS dissertations between 1960 and 2013, Shu et al. (2016) report that LIS doctoral students whose advisors obtained a degree from other fields than LIS are more likely to produce an interdisciplinary dissertation. However, no research describes the impact of LIS doctoral advisors' disciplinary background on their publication activities, which is addressed by this study.

3. Methodology

A manually validated list of doctoral students who graduated between 1960 and 2013 and their advisors was compiled first from the MPACT database (MPACT, 2010), which records all LIS doctoral graduates from 1930 to 2009, and second, LIS doctoral students who graduated after 2010 and their advisors were identified and added to the list by searching the ProQuest Thesis and Dissertation Database and corresponding university websites. This process produced a list of 3,561 LIS doctoral graduates and 928 LIS doctoral advisors. As a result, 3,172 student-advisor pairs (including co-supervision) were formed.

Based on the list of LIS doctoral graduates, all their papers published between six years before and two years after their graduation, defined as the time period of their supervised doctoral studies, were retrieved from the Web of Science (WoS), which includes the Science Citation Index Expanded, the Social Science Citation Index and the Arts and Humanities Citation Index, that annually indexes documents published in about 12,000 journals, covering all areas of research. Advisors' publications during the same periods were also retrieved. Based on the journals in which the papers were published all publications were categorized into 144 disciplines (LIS is one of 114 disciplines) according to the NSF classification system, which assigns each journal to a single discipline.

Thelwall (2016) points out that the geometric mean, comparing to the arithmetic mean, is the

most precise and accurate indicator for comparison when data are skewed. Since the publication and citation data are extremely skewed in the power law distribution, the geometric mean is used to represent the average in this study when counting the average number of publications or citations. In order to allow the geometric mean to include the 0, 1 is added to the counts before calculating the geometric mean and then 1 is subtracted from the result. The shift of 1 is a standard method for calculating the geometric mean of citation data (Thelwall, 2016).

4. Findings

From 1960 to 2013, 3,561 doctoral students graduated from 44 LIS programs with the University of Pittsburgh as the largest source with 406 graduates. The number of LIS doctoral graduates has increased from 18 in 1960 to 114 in 2013 and reaches its highest number of graduates (116) in 2010. Except for 128 students whose advisors were not identified, 3,433 LIS doctoral students were supervised by 928 advisors. 469 advisors (50.5%) obtained a doctoral degree in LIS (hereinafter referred to as LIS advisors) supervised 2,097 LIS doctoral students (61.1%) while the remaining 459 advisors (49.5%) graduated from other non-LIS fields (hereinafter referred to as non-LIS advisors) supervised 1,336 students (38.9%).

Only 26.1% (930/3,561) of LIS doctoral graduates published at least one paper indexed by the WoS during their doctoral studies. The percentage of published students has increased from 3.5% in the 1960s to 42.8% in the 2010s. These 930 LIS doctoral graduates contributed 1,804 papers of which 75.2% (1,357/1,804) are published in a LIS journal; they also published papers in journals in *Computers* (8.0%), *Law* (2.6%), *Management* (2.4%), *Communication* (2.1%) and 36 other disciplines. As Figure 1 shows, LIS doctoral graduates have published more papers in other disciplines other than LIS since the 1960s; the percentage of papers published in a LIS journal decreased from 90.0% in 1960s to 59.7% in 2010s. LIS doctoral students supervised by non-LIS advisors published more papers in non-LIS journals compared with those supervised by LIS advisors (LIS advisor: 16.5% in 2010s and 12.8% at all times; non-LIS advisor: 57.1% in 2010s and 38.9% at all times).

Figure 1 Percentage of LIS PhD Publication in LIS journals

Table 1 compares LIS doctoral graduates supervised by LIS advisors to those supervised by non-LIS advisors. It shows that the latter group has a higher ratio of published students (23.5% vs. 31.1%), a higher average number of publications per student (0.273 vs. 0.380), and a higher citation rate (3.193 vs. 3.374) during their doctoral studies. Students that co-author with their advisor(s) publish more papers that are more often cited. This is shown by analysing the 581 out of 1,804 papers co-authored with advisors, which corresponds to 37.4% (348/930) of LIS doctoral graduate authors. This group published an average of 2.134 papers during their doctoral studies compared with the remaining 62.6% (582/930) of students without advisor co-authorship who published on average 1.429 papers. These 581 advisor co-authored papers were cited on average 4.286 times compared to 2.976 citations for the rest. Compared with LIS advisor students, LIS doctoral graduates supervised by non-LIS advisors had more chance of co-authoring with their advisors (8.5% (178/2,097) of LIS advisor students vs. 12.7% (170/1,336) of non-LIS advisor students), and a higher average number of co-authored publications per student (0.078 papers per LIS advisor student vs. 0.129 papers per non-LIS advisor student).

Table 1. LIS PhD Publications by Advisors Disciplinary Background

5. Conclusion

This study presented an analysis of LIS doctoral graduates published papers since the 1960s that showed a clear increase in the relative number of LIS doctoral students who publish during their studies, and the advisors' disciplinary background has an impact on students' publishing productivity and quality. Specifically, LIS doctoral students supervised by advisors with non-LIS background publish more research that is cited more often. Those non-LIS advisors lead their PhD students to publish more interdisciplinary research and obtain more visibility in terms of the citations.

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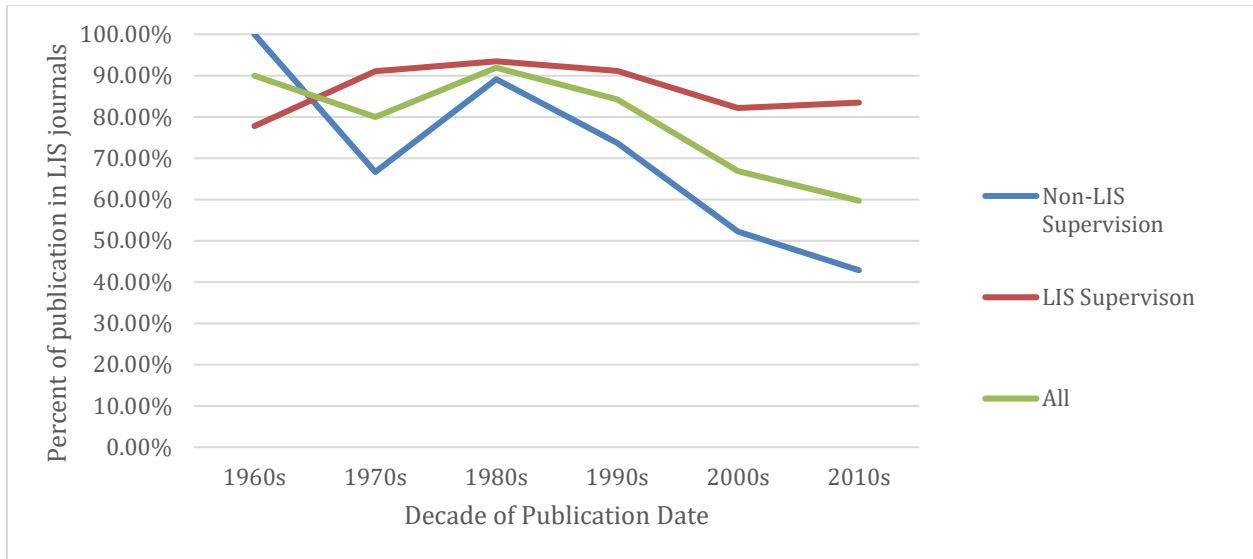


Figure 1 Percentage of LIS PhD Publication in LIS journals

Table 1. LIS PhD Publications by Advisors Disciplinary Background

	Advisor with LIS degree	Advisor with non-LIS degree
LIS PhDs	2,097	1,336
LIS PhDs having publications	493	416
Ratio of LIS PhDs having publications	23.5%	31.1%
Number of publications	966	834
Average number of publications	0.273	0.380
Number of citations received	5,523	6,029
Average number of citation received	3.193	3.374
LIS PhDs (at least one co-authorship with advisor)	178	170
Number of co-authorships with advisors	270	314