Exploring the relationship between gender and career outcomes for social scientists
Implications for research on IS scholarship

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Abstract

Purpose – The paper seeks to provide a structured review of the literature on gender and scholarly career outcomes in the social sciences and discuss its relevance to research on IS scholarship, in order to guide researchers who seek to conduct studies on the role of gender in academic IS careers.

Design/methodology/approach – The authors review the literature to identify all published studies that compare (or theorize about) various academic career outcomes for men and women in the social sciences.

Findings – In comparing the literature from the IS field with other social science disciplines, the authors conclude that gender has been entirely overlooked in studies of IS scholars’ publication patterns and other career outcomes. Propositions are developed for researchers in order to guide future studies that examine the relationship between gender and academic career outcomes.

Research limitations/implications – The paper focuses on studies that compare research productivity and other career outcomes for men and women in social science disciplines. Studies in other disciplines such as engineering, physical sciences, arts and humanities, are omitted. Studies that focus on women only or studies that examine the general antecedents to scholarly outcomes but which ignore gender are also excluded.

Practical implications – This paper seeks to open up a discussion of gender as a valid issue for investigation regarding career outcomes for IS scholars. The authors seek to motivate other researchers to examine whether women are achieving parity in the IS academic field.

Originality/value – This paper provides a comprehensive, structured literature review to systematically study whether gender plays a role in research productivity and other career outcomes for IS scholars.

Keywords Career development, Compensation, Gender, Sexual discrimination, Research, Information systems

Paper type Literature review

Introduction

IS research has increasingly focused on a host of issues facing IS faculty, such as the supply of PhDs in IS (Jarvenpaa et al., 1991), the market for IS faculty (Freeman et al., 2000) and the relationship between scholarly research and teaching effectiveness (Tanner et al., 1999). In recent years, studies have also considered the marginal financial compensation resulting from each additional scholarly publication (Gill, 2001)
and whether the tenure requirements of our universities are reasonable, in view of the limited publication “slots” available in premier IS journals (Dennis et al., 2006). Another important focus of research related to IS faculty is to understand the increasing diversity of IS faculty in terms of race (Payton et al., 2006) and gender (Mangold et al., 1998). Against this backdrop of research on IS faculty, there has been little effort to understand whether women and minority faculty have achieved parity in the IS academic ranks and, if not, what can be done to remedy this problem. In this paper, we focus on gender – leaving to future researchers the challenge of exploring “racioethnic diversity” (Payton et al., 2005). While studies focusing on questions such as whether women publish, receive tenure, grants, or compensation at rates comparable to men are widely published in fields such as accounting, management and economics, these sorts of questions have been entirely neglected within the IS field. By reviewing existing literature in other social science disciplines (and, by contrast, noting the paucity of such studies in IS), we seek to open up a dialogue regarding whether women IS faculty have achieved parity with men. While we advocate ongoing research in this area, unfortunately, we also conclude that critical information needed to facilitate this line of research (e.g. the ratio of women among IS faculty with PhD degrees) is not collected and disseminated at the present time.

To motivate the need for understanding the relationship between gender and scholarly achievements by women in IS, we note that over a dozen studies have been published which list the “top IS scholars” or the research institutions where they are employed. Women rarely exceed 7 percent of those included in such lists[1], yet none of these studies identifying leading IS scholars consider the relationship between gender and research productivity – or other academic career outcomes. We consider it ironic that, while according to some estimates women represent between 25 and 31 percent of faculty in the IS field (Kimery et al., 2003; Mangold et al., 1998), studies that list the most productive researchers include very few women, yet gender is never explicitly mentioned. In a recent study with the goal of drawing attention to the paucity of research on gender in the IS field, Adam et al. (2004, p. 223) noted that:

Whilst interest in gender has begun to permeate and influence other disciplines, the domain of IS has remained fairly watertight against incursions from gender analysis, aside from a few notable exceptions […] Any claims regarding gender are claims about how we frame our social, political and organizational existence, yet these are seen as potentially threatening to the core of IS. Consequently, this adds to the dearth of research on gender and IS. Hence, we create a self-fulfilling prophecy, as the tacit lack of legitimacy of gender and IS as a research topic, results in little or no […] progress [in] the area and it then becomes viewed as a topic unworthy of publication and projects.

While the above comment was offered with regard to the paucity of gender studies in IS overall (including topics such as IT adoption and usage or women’s experiences in IT professional careers), we believe the above quote readily applies to the lack of research on gender with regard to academic career outcomes for IS scholars. Curiously, while there have been many studies published in recent years on gender as a factor shaping IT usage (Habib and Cornford, 2002), attitudes of girls and young women with regard to IT (Adya and Kaiser, 2005; Harris and Wilkinson, 2004), and women’s experiences in IT careers (Trauth, 2002; Woodfield, 2002) – with many of them published in Information Technology & People – the IS literature is still silent on the topic of gender as it relates to IS academic careers. While scores of studies have been published that address this
question in other social science fields (such as accounting, management, economics and public administration), such questions have been ignored in the IS field.

This study offers a conceptual review of prior work on gender as a factor associated with research productivity and other relevant career outcomes in the academy. Given the extensive body of work in other fields, our goal is to provide a structured review of this literature, to convey its relevance to research on IS scholarship and career outcomes, and to offer propositions to guide future work. We explore this paradox of gender being an overlooked issue in studies of IS scholarship and career outcomes and offer a “roadmap” for future research on gender as a factor shaping a range of scholarly outcomes (e.g. number of journal publications, rates of promotion and tenure, access to research grants, appointment to chaired positions, compensation). The relationship between gender and these types of outcomes have been studied in other business, social science, and “hard science” disciplines. We seek to open up a dialogue on these issues, in order to shed light on whether women have achieved parity in IS academia and, if not, we hope to begin the process of inquiry into the reasons why.

Our interest in this area was triggered by a recent study identifying the “Top 30” most prolific IS researchers (Huang and Hsu, 2005), of whom just two were women. While this result is surprising in view of the substantial contributions to IS scholarship by women over the past decade, such a low representation of women is identical to results from other studies published over the past decade that also identified just two women among the top 30 IS scholars (Claver et al., 2000; Im et al., 1998). Women now comprise over 20 percent of the PhD degrees awarded in IS over the last ten years (based on our own analysis of available evidence), and occupy key editorial roles in our leading journals[2]. Thus, we believe it is important to consider the issue of whether women have achieved parity as IS scholars in terms of their relative proportion of publications, their receipt of tenure, and other career outcomes. We begin by reviewing evidence from other fields where researchers posed questions of whether women publish and receive tenure, grants, compensation, and promotion to full professor at rates similar to their male counterparts. As one by-product of our review, we develop propositions to guide future work and identify factors that may serve as barriers to conducting future studies in this area.

Literature review
Understanding the factors that influence the performance of scholars has been a long-standing topic in academe. In delving into this literature, we found over 150 studies that examined antecedents of scholarly productivity, receipt of tenure, grants, compensation, and determinants of institutional prestige in various fields. There is an entire journal devoted to research on the antecedents and outcomes related to academic careers (Scientometrics). More than half of the studies we found focused on research output as the dependent variable, and most of them featured gender as a predictor (either as the primary focus of the study or as one of many control variables). Given the huge body of work that examines gender as a factor associated with research productivity or as an antecedent to scholars’ receipt of tenure, grants, and financial compensation, we organise our review into five areas, which reflect different research questions and/or research methods:

1. studies that identify the raw patterns of journal articles published by women;
(2) studies that collect primary survey data to assess whether gender is associated with scholarly publication rates;
(3) studies that employ archival data to examine whether gender is related to publication rates without using a baseline group for comparison;
(4) studies that employ archival data to examine whether gender is related to publication rates, using a baseline of all PhD graduates in one or more cohorts; and
(5) studies that analyse gender and publication patterns to determine whether gender differences exist in other outcome variables – hiring, tenure, compensation, grants, etc.

While our objective is to review the many studies that have been conducted in other fields (and, by comparison, to draw attention to the paucity of studies conducted in IS), we do not encourage scholars to conduct all of these types of studies. In particular, the first two types of study that we review are problematic – either because they are purely descriptive, thus ignoring changes in the underlying ratio of women receiving PhD degrees in a given field (the first set of studies), or because they are highly susceptible to non-response bias (the second set of studies). Consistent with the format of other conceptual review papers (Adya and Kaiser, 2005; Webster and Watson, 2002), we specify propositions following each part of our review. We remind readers that they should treat studies that are merely descriptive or studies based on primary data collection which are highly susceptible to non-response bias with a degree of healthy skepticism.

Studies examining the ratio of articles published by women

We begin with the most basic set of studies – those that report the proportion of articles by women as a ratio of all published studies in a given journal or field. For example, McGee et al. (2003) examined changes between 1978 and 2000 in terms of the proportion of articles in the Journal of OB Management published by women, showing that the ratio of studies with women first authors or co-authors increased over time. A second study analyzed trends across four organizational behavior journals from 1977 to 1997 (Jarema et al., 1999), showing that the ratio of papers with women first authors rose from 7 percent to 43 percent over the two decades, while the fraction of papers by female authors increased from 10 percent to 33 percent. Using similar methods, but drawing the opposite conclusion that women had reached a “plateau” in the field of health education, Ransdell et al. (2000) reviewed articles from seven health education journals between 1990 and 1998, noting that the ratio of papers with a female first author was constant (at 50 percent), as was the proportion of papers with one or more female co-authors (at 71 percent). Studies describing trends in the proportion of papers by women have also appeared in fields such as marketing (Walters et al., 1990), education (Lockheed and Stein, 1980), public administration (Slack et al., 1996), and science education (White, 1997).

The problem with such descriptive studies that just report the ratio of papers by female authors is that they provide no baseline data regarding comparable changes in the ratio of women scholars in a given field over the same time interval. While they are easy to conduct, such studies fail to indicate whether gender parity is being achieved within a given journal or across an entire discipline, because they ignore the relevant “denominator” – the proportion of women in the specific field, and how this value has
changed over time. For example, the study of health education journals (by Ransdell et al., 2000, p. 224) concluded that the “proportion of articles to which women contributed was impressive (65-85%)” and they proposed that health education be considered a “model for the rest of the academy”. Despite this positive “spin” on their results, these authors reported that women represented 48 percent of all authors of health education studies, while “71% of those in graduate programs [. . .] were women”. Thus, rather than serving as a model for the rest of the academy, published studies in health education journals indicate that women represent a much lower proportion of authors compared to their relative numbers in graduate programs. In addition, if a co-authored study had just one female co-author, Ransdell et al. (2000) counted that study as part of aggregate value of “65-85% of articles to which women contributed”.

While such studies may reveal promising results (due to upward trend lines in the proportion of women authors), we regard such studies as offering raw data, at best, given the lack of baseline data about increases in the proportion of women in a given field. Whether the rise in the raw proportion of papers published by women authors has kept pace with their growing numbers of advanced degree recipients is better captured through the other types of studies that we describe below. In IS specifically, we found one study that fit this genre (and, by the way, this was the only study we found of women in academic IS careers): Kimery et al. (2003) examined trends in authorship in two top journals (MIS Quarterly and Journal of MIS) from 1984 to 1999, showing that the proportion of papers by women increased from 11 percent to 23 percent in MIS Quarterly and from 0 percent to 8 percent in Journal of MIS, over the 15-year interval. Since one objective of our paper is to offer propositions to guide future research, we offer the following two propositions:

P1. The proportion of articles published in scholarly IS journals with a female first author has increased over the past decade.

P2. The proportion of articles published in scholarly IS journals that include at least one female co-author has increased over the past decade.

Such propositions can guide future studies that are journal-specific or across a set of journals. They may also guide comparative research on trends for US versus European journals or for conferences located in different geographic regions (e.g. ECIS, AMCIS, PACIS) to detect possible gender differences.

Studies using surveys for primary data collection
The second set of studies consists of those where researchers collect survey data from subjects regarding their publication patterns – mostly through online surveys. While primary data collection would seem to be a straightforward way to learn about researchers’ publication records and it has the advantage of not relying on secondary data collected for other purposes, it is rarely employed in fields other than IS. We found few studies in other disciplines where authors relied on primary survey data they collected based on scholars’ self-reported publication counts. For instance, across the fields of accounting, management, and economics (which are highly represented in other areas of this review), we found just one study in each field where authors collected and relied on primary survey data from subjects regarding their number of publications. In IS alone, there have been five studies that collected data on IS scholars’ publication patterns or experiences with the journal review process, but nearly all of
these IS studies had low response rates (or failed to report a response rate), most neglected to conduct an analysis of non-response bias, and none of them analyzed gender differences for the constructs of interest. Tanner et al. (1999) analyzed the relationship between research output and IS faculty teaching evaluations, Gill (2001) studied the relationship between faculty salaries and their number of published journal papers to determine the “marginal economic value” of publishing one additional scholarly article, and finally Koh (2003), Dalal et al. (1999) and Bhattacharjee et al. (2004) studied IS scholars’ experiences and attitudes regarding the journal review process. These five studies had varied response rates (16 percent, 12 percent, and 31 percent, for the first three studies, respectively, and no response rates reported for the last two studies).

While such studies, based on primary data collected from researchers, appear to be far more common in IS than in other fields, we advise caution in drawing conclusions from such studies. Beyond the fact that response rates were generally quite low (with the exception of Koh, 2003) or could not be computed (in the case of online surveys, such as those available on ISWorld) – there is the problem of non-response bias. Subjects who respond to the survey may differ from non-respondents in terms of key variables (e.g. gender, geographic region, type of university where employed, job rank or years of experience), and the results that subjects report (numbers of papers published) may not be accurate. For example, while the authors of one study (Bhattacharjee et al., 2004) neglected to conduct an analysis of non-response bias, they acknowledge the dual risks that respondents may differ from non-respondents in terms of key variables, and also that respondents may offer exaggerated reports of their achievements. The authors note that:

As in all survey research, potential bias and under/over reporting from participants are possible. Respondents were asked to recollect submitted research over a five year period. Journals such as Management Science and ISR [often] report acceptance rates below 20 percent […] yet the self reported data [from our respondents] for these two journals is 40 percent to 50 percent […] We can only surmise that the self-selected respondents to our survey were [unusually] successful as authors or were authors who did not want to share data on their failures (Bhattacharjee et al., 2004, p. 643).

While surveys of faculty attitudes and achievements (often administered online) are increasingly common in the IS field, such online studies have consistently ignored the role of gender, and many of them fail to observe good research practices, such as neglecting to conduct an analysis of non-response bias. This has led to increased scrutiny of primary surveys and their low response rates in recent years (Sivo et al., 2006). Studies that rely purely on self-reported respondent data are much less common in other fields than in IS. Across all other academic fields, we found just three studies (one each in marketing, accounting and economics) which relied on primary surveys for most of their data. In contrast to the IS studies mentioned above, the three studies in other business subjects had much higher response rates, conducted analyses of potential non-response bias, and did include specific gender analyses[3]. These studies found that faculty at PhD-granting schools were over-represented in the sample of respondents, while faculty at other institutions were under-represented. Of the three surveys, one concluded that women publish less than men (Diamantopolous, 1996), while the other two found no gender differences in the research output of economists (Barbezat, 2006) or accountants (Buchheit et al., 2001).
While we consider these studies from other fields to be models of good research design because they reported their response rates, conducted analyses of potential non-response bias, and included gender as a control variable in explaining research productivity, some of them had other limitations. It is also important for such studies to control for other covariates that are known to influence scholars’ research productivity (and some of these factors may be correlated with gender) – such as the research orientation of the university in which each faculty member is employed, as well as the rank or tier of the PhD program from which each respondent graduated. It is certainly the case in many fields that women are less likely to graduate from the top PhD programs, or to be hired into faculty positions at heavily research-oriented, PhD-granting institutions. The theory of *cumulative advantage* posits that individuals who are advantaged early in life (whether in terms of gender, race, social class, or other factors) will continue to accrue further advantages that, over time, increasingly distinguish them from others who are less advantaged (Allison *et al.*, 1982; Creamer and McGuire, 1998). For example, if women seeking PhD degrees in economics are less likely to be accepted into top-ranked PhD programs compared to men, then they are less likely to be hired as tenure-track faculty at other top research-oriented institutions. Thus, the resources that accrue to some individuals early in life are self-reinforcing or *cumulative advantages*. In order to truly discern the effect of gender on research productivity, factors such as the rank or tier of the program from which faculty received their PhDs should be included as control variables. For instance, a study of accountants by Buchheit *et al.* (2001) did control for rank of the PhD program from which each respondent graduated; the study of marketing faculty neglected to do so (Diamantopoulos, 1996).

The genre of studies in this category – primary surveys asking faculty about their publication output (or other experiences related to journal submissions) – is rare in most social science fields, while becoming increasingly common in IS. We believe this is largely attributable to the ease of conducting online surveys on IS-World (Venable, 2002)[4]. While such studies have the advantage of using primary data (rather than re-using archival data gathered for other purposes – such as journal tables of contents or online databases that list faculty publications), primary surveys suffer from the three limitations we described above:

1. response rates are often very low (or cannot be computed if the survey is simply posted to a web site);
2. non-response bias is often not analyzed; and
3. self-reported publication data are rarely, if ever, verified.

In such studies, researchers trust subjects to accurately recall and honestly report their number of journal publications, submissions, rejections, etc. For example, one study of the antecedents of IS faculty publications examined the factors that explained research productivity, based on a postal survey mailed to more than 2,000 members listed in the 1995 North American Directory of MIS Faculty (Hu and Gill, 2000). Just 172 completed surveys responses received were included in the analysis (a response rate of 8.6 percent, assuming a denominator of no more than 2,000 surveys distributed); however, this study provided no analysis of non-response bias and no analysis of gender as a predictor variable or covariate. In a similar study analyzing the correlation between research productivity and teaching evaluations, Tanner and colleagues acknowledged...
these sorts of problems by noting that: “Such samples of convenience are naturally subject to potential bias, which may limit the amount of validity of the results” (Tanner et al., 1999, p. 9). A final concern is the fact that methodological experts on survey research have noted that survey response rates tend to be significantly higher for women than men (Fox et al., 1988), a general phenomenon that has been shown to occur in surveys in various fields (Barbezat, 2006; Fox et al., 1988), including IS (Moore, 2000). If such gender differences in response rates are not taken into consideration, and if gender is correlated with other constructs examined in the survey, then serious problems of estimation bias may result (Sivo et al., 2006).

P3. When conducting faculty surveys, women’s response rates will be higher than those of men.

*Studies using archival data without a baseline for comparison*

The most common type of studies on research productivity are based upon archival data (i.e. lists of journal articles). Drawing from online databases of published articles, such studies then identify the most “prolific” individuals in a given field, the leading research institutions, and sometimes also the impact of individual demographic factors (e.g. age, gender, marital status) and institutional factors (e.g. a university’s research orientation) on researcher productivity. Given the fact that relatively few PhD graduates publish papers in academic journals, this means that these types of archival-based studies limit themselves to the elite subset of researchers who do publish journal papers. By definition, such archival studies lack any baseline data for subjects holding PhD degrees who do not publish. We regard the practice of computing statistics about scholars who publish journal papers as analogous to attempting to describe an iceberg: by focusing on the (relatively small) portion that is visible, one lacks information about whether the visible portion is similar to or different from the submerged portion (which actually represents the majority of the iceberg). Similarly, with counting and computing statistics about authors’ journal publications: these data tell us nothing about the degree to which the observed patterns hold true for other members in the field who do not publish. Specifically, if 15 percent of those who do publish journal articles in a given field are women or 7 percent of those listed as the most productive authors are women, this tells us nothing about the underlying population of PhD graduates in that field, unless extra steps are taken to collect and validate such information. It is critical to bear in mind such limitations of archival studies when interpreting the results from scores of archival studies that examine research productivity.

Most studies that identify the leading scholars in IS are archival studies of this nature. These are the studies we described at the beginning of the paper (e.g. Athey and Plotnicki, 2000; Huang and Hsu, 2005; Im et al., 1998), which have frequently reported that women constitute less than 7 percent of the “Top 30” most productive IS researchers. However, just because women represent 7 percent of the “Top 30” IS scholars reported in these studies, this reveals nothing about the overall ratio of women in the IS field or whether women in IS have achieved parity with men – unless a complete listing of all PhD-degree faculty in the IS field is available. In some other fields, such as accounting, one can readily compare results from a study showing 20 percent women among the “Top 50” researchers (Hasselback et al., 2003) to the overall proportion of women faculty, because lists of accounting faculty are updated and
published annually. In the IS field, since we lack a comprehensive, up-to-date list of faculty, we must rely on other data sources to estimate the proportion of women faculty in order to know whether the ratio of women appearing on a list of most productive researchers is similar to their representation among all IS faculty. While such up-to-date faculty information is lacking in the IS field – but did exist prior to 1996 when McGraw-Hill published a triennial *North American Directory of MIS Faculty* (DeGross *et al.*, 1995). A similar directory of IS faculty in various European countries was published once, in 1993.

While archival studies that simply compare the average number of publications by men and women (or those listing the names of most productive scholars) are relatively easy to conduct, the problem with attempting to draw conclusions from them is that, unless there is a pre-defined cohort group, or one accurately knows the proportion of women PhD recipients and/or faculty in a given field, then knowing the number of women among the “Top 30” or “Top 75” researchers – or the fraction of all papers published by women – is not enough to draw conclusions about the comparative achievements of men and women. Since studies that aggregate their publication data from archival sources (e.g. online publication databases) lack baseline data about the underlying ratio of men and women in the field, they cannot tell us whether women have reached parity in terms of research output. On the other hand, archival studies are useful for answering a range of other types of questions such as:

- Who are the most productive scholars in a given field (e.g. Huang and Hsu, 2005)?
- Which are the most productive institutions in a given field (e.g. Lowry *et al.*, 2007)?
- Which researchers tend to co-author together (Vidgen *et al.*, 2007)?
- Which researchers have the largest co-authorship networks (Xu and Chau, 2006)?

A dozen studies have identified the most productive IS researchers and/or the leading research institutions (Vogel and Wetherbe, 1984; Grover *et al.*, 1992; Lending and Wetherbe, 1992; Eom, 1994; Lowry *et al.*, 2007). Of course, the lack of a baseline census of faculty means that it is impossible to know either the proportion of women in IS academia or what fraction of faculty do *not* publish in journals. These issues are ignored as a matter of convenience and because the focus of such work is to identify who actually publishes, how much, and where they are employed. Like the iceberg metaphor we described above, archival studies focus on the most easily observable aspect of research output, without considering the attributes of other faculty who do not publish journal articles, or how similar those who *do* publish journal articles are to those who do not in terms of individual factors (gender, age, ethnicity) or institutional factors (the type of university at which they are employed, i.e. PhD-granting or not, and whether the institution is nationally accredited or not).

As we mentioned in the introduction to this paper, we found it surprising that *none* of the IS studies specifically examined (or even mentioned) gender. This is the case, despite the fact that women represent less than 7 percent of top-ranked authors in most of these studies (e.g. Claver *et al.*, 2000; Im *et al.*, 1998; Huang and Hsu, 2005), although the ratio of women was much higher in one study (Athey and Plotnicki, 2000). Table I shows the relevant IS studies, including the journals reviewed, the time period in
<table>
<thead>
<tr>
<th>Authors</th>
<th>Time period covered</th>
<th>Total number of journals reviewed</th>
<th>Scholarly IS journals included</th>
<th>Other scholarly journals included</th>
<th>Practitioner journals included</th>
<th>Number of women&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Women included in results</th>
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<tr>
<td>Claver et al. (2000)</td>
<td>1981-1997</td>
<td>2</td>
<td>DSci, ISR, JMIS, MISQ, I&amp;M</td>
<td>None</td>
<td>None</td>
<td>2/25 (8.0)</td>
<td>S. Jarvenpaa, N. Pliskin</td>
</tr>
<tr>
<td>Palvia et al. (2007)</td>
<td>1992-2005</td>
<td>1</td>
<td>I&amp;M</td>
<td>None</td>
<td>None</td>
<td>2/33 (6.0)</td>
<td>N. Pliskin, Y. Yoon</td>
</tr>
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Note: <sup>a</sup>Figures in parentheses are percentages

Table I. Studies reporting the most productive IS researchers

Gender and career outcomes
question, as well as the raw numbers, proportion, and names of women who appeared in the resulting lists of top IS researchers. Even for simple descriptive purposes, we consider some of the studies listed in Table I to be more informative than others. For example, some studies counted publications in just one or two journals (Claver et al., 2000; Palvia et al., 2007; Trower, 1995), while others listed less than a dozen top IS researchers (Remus, 1991), or counted studies published in journals with high acceptance rates (Clark and Warren, 2006)[5].

In addition to the studies in the IS field, we found many studies that used archival methods in other disciplines. While some of these also just listed the names of the most productive authors, some included explanatory models of research productivity that featured gender and other individual-level factors (e.g. years since receiving PhD, job rank or title) and institutional factors (the type of employer). We summarize a few exemplar studies with the goal of demonstrating the types of analyses that are possible to conduct. First of all, the range of fields where gender differences were analyzed as a covariate, in addition to other factors that explain research productivity is quite broad: criminal justice (Stack, 2002), accounting (Hasselback et al., 2003), biochemistry (Long, 1990; Xie and Shauman, 1998). One study even analyzed archival publication data across four social/physical science fields (Sax et al., 2002). Outside the IS field, however, we found few studies that simply listed the most prolific authors[6], or simply compared the average number of publications by men and women without knowing the underlying proportion of women in the given field of study. We consider the paucity of simple “gender comparison” studies in other fields to be a positive outcome, since lists of men and women who are among the most productive scholars in a given field or figures that just report the proportion of journal publications by women are not meaningful for purposes of assessing women’s progress in a given field, unless such results can be interpreted in the context of data about the ratio of women faculty with PhD degrees in a given field of study. To draw the latter types of conclusions, cohort-type studies are required, which we discuss in the next section.

Archival studies need not just list the names of top researchers or leading departments in a given field. In addition, they can include additional analyses that are useful for understanding women’s achievements in a given field of study. For example, archival studies can also:

- compare the ratio of all articles published by women in a given field (or in a specific journal) to the ratio of women faculty with PhDs in that field of study; and
- compare whether women, on average, publish the same number of articles as men, controlling for factors such as type of research institution, tenure status, and other factors (comparisons based on archival data are restricted to faculty who have published).

We conclude this section with a proposition:

**P4.** The ratio of journal papers published by women IS researchers will be proportional to their overall representation among PhD-level IS faculty.

*Studies using a cohort baseline of PhD graduates*

The fourth category of studies is similar to the prior set of studies, except that it compares research output for all men and women faculty with PhD degrees in a given...
field – and not just for those who have published journal articles. Rather than just studying the relatively small fraction of scholars that have published in scholarly journals while ignoring the majority of PhD graduates who never publish in journals, these studies are careful to define all members or one or more PhD cohorts and then count the publications for each member. To revisit our iceberg metaphor, this genre of study seeks to characterize the whole iceberg, and not just the portion that is visible above the surface (i.e. those faculty members who publish journal papers). Cohort studies are able to establish a baseline of the total number of PhD graduates (using a census listing of all members’ names), and then analyze what fraction of men and women from the cohort publish in scholarly journals, as well as the exact number of their publications. Cohort studies are the ideal research method for examining the relationship between gender and research productivity, because these studies begin with a list of all PhD graduates in a given field (or all faculty with PhD degrees holding university appointments).

The conclusions drawn from cohort studies are much more valid than the other types of studies we reviewed above. While similar in some ways to the types of studies in the previous category (i.e. they count journal articles listed in online databases), they can also draw meaningful inferences to the original PhD cohort, for which most members do not publish any journal articles. In various fields where PhD cohort data have been analyzed, only 20-30 percent of PhD graduates have any publications in scholarly journals; the average number of publications per cohort member is usually less than 0.3. Of course, such cohort-type studies have the challenge of locating a census (a complete listing of PhD graduates in a given discipline in a given year), which can be difficult to find. In some fields, such data are routinely collected and published – or made available on the internet (e.g. accounting, finance, and economics)[7].

Table II summarizes previous cohort studies across a range of social science fields, with the ratio of women in these cohort studies ranging from 13 percent in accounting to 31 percent in management (not counting studies that used matched pairs of male and female PhD recipients)[8]. Of all cohort studies shown in Table II, half the studies found evidence of gender differences in research productivity among accounting faculty (Dwyer, 1994) and economists (Davis and Patterson, 2001; Fish and Gibbons, 1989; Ginther and Kahn, 2004). These studies concluded that women published fewer papers than their male counterparts[9]. While these four cohort studies found significant gender effects, four others found no gender differences, after controlling for relevant covariates. Since the men and women in these cohorts may also differ from each other in terms of other factors (e.g. the rank of the PhD program from which they graduated or the research-orientation of the university employing them), it is important to control for such factors. For example, the type of job placement (in a university versus a liberal arts college) may differ for the men versus women who graduated in a given cohort. Studies that neglect to control for these factors may yield a distorted picture of the effect of gender on scholarly output. Such studies that neglect to control for the research orientation of the employer may incorrectly conclude that women publish less than men when, in fact, women may be more likely to be hired into institutions (or specific job types, such as non-tenure-track instructors) with fewer resources, heavier teaching loads, and less focus on research[10]. In certain fields like economics, some
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Discipline</th>
<th>Cohort year(s)</th>
<th>Number of cohorts</th>
<th>Total n</th>
<th>Percentage female</th>
<th>Significant gender differences found?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwyer</td>
<td>1994</td>
<td>Accounting</td>
<td>1981</td>
<td>1</td>
<td>139</td>
<td>19</td>
<td>Yes (F &lt; M)</td>
</tr>
<tr>
<td>Streuly and Maranto</td>
<td>1994</td>
<td>Accounting</td>
<td>1960-1992</td>
<td>6</td>
<td>610</td>
<td>50</td>
<td>No</td>
</tr>
<tr>
<td>Davis and Patterson</td>
<td>2001</td>
<td>Economics</td>
<td>1982-1983</td>
<td>1</td>
<td>915</td>
<td>15</td>
<td>Yes (F &lt; M)</td>
</tr>
<tr>
<td>Fish and Gibbons</td>
<td>1989</td>
<td>Economics</td>
<td>1969-1984</td>
<td>16</td>
<td>960</td>
<td>50</td>
<td>Yes (F &lt; M)</td>
</tr>
<tr>
<td>Ginther and Kahn</td>
<td>2004</td>
<td>Economics</td>
<td>1990</td>
<td>1</td>
<td>190</td>
<td>50</td>
<td>Yes (F &lt; M)</td>
</tr>
<tr>
<td>Hickman and Shrader</td>
<td>2000</td>
<td>Finance</td>
<td>1988, 1990</td>
<td>2</td>
<td>226</td>
<td>19</td>
<td>No</td>
</tr>
<tr>
<td>Williamson and Cable</td>
<td>2003</td>
<td>Management</td>
<td>1987-1992</td>
<td>6</td>
<td>211</td>
<td>31</td>
<td>No</td>
</tr>
</tbody>
</table>
studies even control for scholars’ research specialty within the field (Barbezat, 2006; Davis et al., 2001).

Of the eight studies listed in Table II, four reported no gender difference in research output, after controlling for relevant factors. This included cohort studies in accounting (Streuly and Maranto, 1994), strategic management (Park and Gordon, 1996), management (Williamson and Cable, 2003), and finance (Hickman and Shrader, 2000)[11].

Cohort studies are more labor-intensive than simply counting publications for those who have published journal papers, since they begin with a list of all PhD graduates in a given field – using the total number of male and female PhD graduates as the denominator in computing publication rates for men and women. By taking into account the fact that most PhD-level faculty never publish in scholarly journals, cohort studies provide a more representative picture of average research productivity. They represent the ideal approach to examining the role of gender and other personal factors on scholars’ productivity and other academic career outcomes; however, they are difficult to conduct if a given field does not maintain a list of all faculty employed in the field, or the names of those receiving their PhD degree, by year. It is desirable for such cohort lists to include both the name of the institution granting the PhD degree, as well as the current employer, in addition to full names of PhD recipients[12].

In the areas of accounting, economics, and finance, such comprehensive directories exist and are updated on an annual or biannual basis (Hasselback’s Faculty Directories). Many authors use these directories as the basis for their cohort studies. For instance, we located five studies of accounting faculty research output that used the Hasselback Accounting Faculty Directory (Hasselback et al., 2003; Daigle and Arnold, 2000; Davis et al., 2001; Rama et al., 1997; Streuly and Maranto, 1994). In evaluating the studies listed in Table II, we note that all of them restricted their analysis to researchers who graduated in a specific cohort year(s) and who were employed as full-time faculty. Based on the results from the cohort studies, we offer propositions for future research – although testing these will require that researchers have access to cohort lists of those receiving their PhD degrees in a given year or across a range of years, as well as accurate and up-to-date faculty directories.

P5. Studies that analyze the relationship between gender and research productivity will show no gender effect if they control for the type of job in which scholars are employed (research university with a PhD program, research university without a PhD program or liberal arts college).

P6. Studies that analyze the relationship between gender and research productivity will show that women publish less if they neglect to control for job-related factors (type of institution in which the researcher is employed, and tenure-track versus other type of position).

Studies examining gender, publications and other career outcomes
There have also been studies that developed explanatory models to determine whether gender is a predictor of other career outcomes. In the studies summarized in this section, number of journal publications serves as an independent (rather than dependent) variable in predicting other career outcomes. This includes studies of the effect of gender on academic hiring, receiving tenure, promotion to full professor and
chaired professorships, receipt of grants, and financial compensation. We found many studies that examined the relationship between gender and these outcomes in fields as diverse as economics (Ginther and Kahn, 2004; Mixon and Treviño, 2005), management (Park and Gordon, 1996), accounting (Buchheit et al., 2001; Omundson and Mann, 1994; Rama et al., 1997), and political science (Ginther, 2004). Others appeared in other fields, including the humanities (Ginther and Hayes, 2003) and physical sciences (Prpić, 2002; Xie and Shauman, 1998), which we do not review in detail here. Of course, gender is not examined in a vacuum in such studies; rather, it is one predictor that is analyzed along with other covariates that are known to affect the specific outcome. Other predictors include a researcher’s total number of publications, articles in scholarly journals (or in elite scholarly journals only), the rank or tier of the PhD program from which the individual graduated, and whether the scholar is employed in a university with a PhD program or other institution of higher learning. Some studies also include the individual’s age, years on the faculty, and tenure status. In addition, cohort studies are occasionally combined with primary survey data (e.g. Barbezat, 2006), which may also provide information about marital status, children, teaching load, and proportion of working hours devoted to teaching.

In studies corresponding to the first two categories (those examining hiring and tenure outcomes) the norm is to focus just on faculty in their first academic position; other individuals are usually discarded from the dataset. The studies we describe below consider only faculty being hired into or evaluated for tenure in their first academic job. Such studies have reached varied conclusions – some suggesting that gender equity had been achieved, others implying that gender discrimination against women was present, and still others suggesting that reverse discrimination exists in some fields (i.e. preferential treatment for women, which results in bias against men). Some studies report that the women who received tenure had stronger publication records than their male counterparts receiving tenure, although the results varied for different types of institutions. In one study, women accounting faculty receiving tenure had published significantly more journal papers than men, but the difference was statistically significant just at non-PhD-granting institutions, which are less research- and more teaching-oriented than PhD-granting institutions (Rama et al., 1997). That study found no differences between the women who earned tenure at PhD-granting institutions versus their male peers, but the authors concluded that women must meet a “higher bar” than men in order to secure tenure at the non-PhD-granting institutions. One explanation is that other factors are more important for securing tenure than research output at non-PhD-granting institutions (such as teaching evaluations, consulting activity, or departmental service), but the latter factors were not analyzed by the studies in question.

Other studies of accounting faculty used the same dataset to answer the same questions, but reached opposite conclusions. Buchheit et al. (2001) also studied the accountants who earned tenure in both PhD-granting and non-PhD-granting institutions, but they could not replicate the results of Rama et al. (1997). Other scholars conducted similar studies of accountants, and found no differences between men and women accounting faculty receiving tenure, in terms of numbers of publications or other factors (Collins et al., 1998; Omundson and Mann, 1994). These three studies imply that women do not face a “higher bar” to achieving tenure in accounting departments. Collins et al. (1998) found no difference between the men and
women receiving tenure in accounting departments; however, they argued that discrimination may have occurred at a prior stage (job hiring), so that the bar was set higher for women, who had to be more highly qualified than men to be hired into research-oriented accounting departments the first place. A later study by the same authors found no evidence of discrimination in faculty hiring for universities overall (Collins et al., 2000), but they showed that, for women receiving their PhD degree from “mid-tier” accounting departments, gender discrimination in hiring existed – but not for those receiving PhD degrees from either “top-tier” or “low-tier” schools. Such “mid-tier” female graduates were less likely to be hired into faculty positions at research-oriented institutions, proving that gender discrimination occurred in hiring such “mid-tier” PhD graduates.

Studies have also found conflicting results across different disciplines, when using identical research methods: Ginther and Kahn (2004) found that women economists were less likely to achieve tenure than men, even after controlling for key factors such as numbers of publications, but Ginther (2004) found the opposite result in the political science field, where women were more likely to achieve tenure than men with similar qualifications. It is certainly possible, that gender discrimination exists in some academic fields but not others. For example, discrimination may occur in economics (Ginther and Kahn, 2004) but not in political science. In the area of strategic management, Park and Gordon (1996) claimed that gender discrimination existed, since women were 74 percent more likely to be rejected for tenure than men (after controlling for various factors), but women published more papers in the first five years after receiving their PhD degrees[13]. Taken as a whole, these studies suggest that discrimination against women occurs during the hiring stage in accounting (Collins et al. 2000) and during the tenure evaluation stage in economics (Ginther and Kahn, 2004) and perhaps also in strategic management (Park and Gordon, 1996).

Conversely, gender discrimination appears to have been eliminated in other fields, and “reverse discrimination” (i.e. against men) may even occur in political science, possibly in order to correct for past hiring practices that gave preferential treatment to men (Ginther, 2004). In addition to the fact that these studies analyze only those faculty members being evaluated for tenure in their first faculty position (but not in subsequent positions), another common limitation of these studies is that the authors analyze the research output of faculty who did receive tenure (Buchheit et al., 2001; Ginther and Kahn, 2004; Ginther, 2004), thus neglecting to analyze data for faculty who were denied tenure. The one exception we found was Buchheit et al. (2000), who analyzed research output for faculty who received tenure as well as for those denied tenure. Analyzing data about both those receiving tenure as well as those denied tenure is desirable, but unfortunately rare. The reason it is better to include those denied tenure as well is that simply knowing whether gender differences exist in terms of research output for the men and women who did receive tenure (e.g. if the women needed to have more publications to earn tenure, as Rama et al., 1997, argued), this provides no information about relative strength of the men and women who were denied tenure. Rama et al. (1997) showed that women accounting faculty receiving tenure had more publications than men (thus raising the possibility that higher standards were applied to evaluating women for tenure), yet such a result does not prove that the women denied tenure faced discrimination, unless data for those denied tenure is incorporated into such analyses. Unfortunately, most studies neglect to do this (with the exception of Buchheit et al., 2000).
Other studies have used data about men’s and women’s research output as a predictor variable to try to explain whether gender discrimination occurred for other academic outcomes – such as financial compensation (Broder, 1993; Ginther and Kahn, 2004), receipt of chaired professorships (Mixon and Treviño, 2005), and access to research grants (Levin and Stephan, 1998).

Since most of these studies were of economists by economists and many of them featured advanced econometric techniques to assess whether discrimination occurred, we omit the details. Instead, we simply conclude that approximately one-third of the studies found evidence for gender discrimination in terms of compensation (Ginther and Kahn, 2004; Mixon and Treviño, 2005) which could not be explained, based on the faculty members’ research productivity, years on the job, type of university, and other factors. Since we found practically no studies of IS or business school faculty that studied the effect of gender on financial compensation, we omit an in-depth review of this area. The only studies we found reported no gender difference in compensation of management faculty (Gomez-Mejia and Balkin, 1992) or accounting faculty (Sayre et al., 2000); however, they found no direct effect for gender after controlling for relevant covariates (e.g. years in the job, research productivity, etc.). However, these authors did show that faculty who moved between jobs were paid at higher levels. While this fails to provide direct evidence of gender discrimination, if we combine this result with the fact that men are known to be more effective than women at converting higher salary offers at competing institutions into raises in their current positions[14], this could provide one explanation why some studies in the “hard sciences” have shown that men are paid more than women – without overt discrimination occurring: men may be more aggressive in securing competing offers and then threatening to leave their current position if their competing salary offer is not matched by their current employer (Blackaby et al., 2005).

Discussion

In reviewing relevant literature from other disciplines, it is clear that there is considerable interest in the question of how gender influences (or interacts with other factors that shape) scholarly career outcomes. This includes the question of whether men and women publish at similar levels and, if differences in research productivity exist, then to specify what factors may account for such differences – whether differences in the quality of research training, differential hiring into positions with greater research resources, lower teaching loads or other factors that may benefit men, while causing “cumulative disadvantage” to women (Creamer and McGuire, 1998; Allison et al., 1982).

It is also obvious that studies that examine gender differences in research productivity have been repeatedly conducted in fields such as accounting, finance, management, economics, public administration and other disciplines but not in IS. While there have been scores of studies in the IS literature identifying the leading IS journals, as well as the leading IS scholars and IS departments (e.g. Clark and Warren, 2006; Lowry et al., 2007), the question of whether men and women have similar or different publication patterns has not been raised. We believe it is useful to conduct such studies to analyze the relationship between gender and publication patterns, since this is a necessary first step to understanding and being able to explain whether
women in IS are achieving equity in other areas (e.g. tenure, promotion to full
professor, receipt of grants, chaired professorships).

While somewhat speculative, we have noticed a consistent pattern whereby, in other
scholarly fields, researchers show a preference for framing issues in terms that are
amenable to analysis through common analytic tools and methods for a given field of
study. Hence, sociologists use social network analysis to develop models that explain
collaboration in terms of structured networks (Moody, 2004), accountants focus on
counting scholarly publications and providing ranked lists of most productive scholars
(Hasselback et al., 2003), and economists develop complex econometric models to
explain compensation and access to funding sources, such as grants and chaired
professorships (Ginther and Kahn, 2004; Mixon and Treviño, 2005). In a speculative
manner, if we were to extrapolate from this observed pattern of scholars framing
questions in ways that familiar tools and methods from their respective fields can
answer, we would expect IS researchers from a decision sciences tradition to develop
complex models to aggregate prior studies that have ranked IS journals (Forgionne and
Kohli, 2001), while for IS researchers from a critical theory tradition, we would expect
them to challenge conventional approaches to counting publications and creating
ordered lists of “journal rankings” as the methods employed for evaluating scholars’
contributions. To date, the latter types of studies have not been published in IS,
although we are aware of these types of critical studies being published in other fields,
such as management (Singh et al., 2007).

We are puzzled by the fact that IS researchers frequently publish lists of the most
productive researchers, institutions, and most highly ranked journals (Clark and
Warren, 2006; Huang and Hsu, 2005; Lowry et al., 2007), often without delving into the
reasons why such patterns occur. Particularly, there has been no attention focused on
the question of whether women have achieved parity in the IS field; however, the exact
same question has been raised and repeatedly addressed in accounting, management,
and economics for the past 20 years. Perhaps within the IS community, we are
reluctant to talk about gender. Is this due to the belief that, because IS is a relatively
new field, old ideas, and the “old boys’ network” that often reinforces these ideas, has
no place in the field? There is a common belief that, in hiring for professional IT jobs in
business and industry, employers are gender-blind. Whether this claim is true, or
simply a myth, it may discourage scholarly researchers from asking questions about
gender equity on the academic side of the IS field. While the IS literature was initially
slow in terms of taking up the call to apply gender theory and gender analyses to IS
research topics, as signified by the quote from Adam et al. (2004) in our Introduction
(above), we question whether scholars are likewise reluctant to pose similar questions
about gender parity in IS.

While we are unable to answer the question of whether women have achieved parity
on the academic side of the IS field, we believe it is important to specify what we mean
by this term. Parity does not mean that women comprise 50 percent of faculty in IS
departments, nor that PhD programs should be 50:50 male and female. Parity can be
manifested in different ways at various milestones. In terms of hiring into academic
jobs, it means that women and men who complete the PhD programs at the same
institutions (or similarly-ranked ones) have equal chances of being hired into
tenure-track faculty positions at research institutions and other types of colleges and
universities. In terms of research productivity, parity would be manifested in women
publishing the same percentage of journal papers across a set of high-quality journals as their overall ratio among IS faculty. For example, if women represent 20 percent of IS faculty with PhD degrees, then gender parity would imply that women publish 20 percent of scholarly papers. It would also imply a lack of statistically significant differences between the average research productivity of men and women, after controlling for key control variables, such as the types of academic institutions where they are employed, their job titles, and the rank or tier of the programs from which they received their PhD degrees.

At present, we have little evidence to argue one way or another whether women have achieved parity with men in IS. Studies that list just the “Top 30” or “Top 50” scholars are not very useful in this regard, since these very small lists of elite scholars represent at most the top 1 percent of IS scholars. It can be quite misleading to try to generalize from attributes of the leading 1 percent of IS researchers (e.g. that women comprise just 7 percent of this elite set) to other scholars in the field (Huang and Hsu, 2005; Im et al., 1998). Such information, of course, reveals nothing about women’s representation among the “Top 200” or “Top 500” researchers, or among all IS researchers who publish journal articles. Our own recent study reported that women IS scholars published between 14 and 16 percent of papers across a set of 12 leading scholarly journals, depending on whether normal counts or adjusted counts were the metric (Gallivan and Benbunan-Fich, 2007). Unfortunately, we lack detailed information about how these figures compare to the proportion of women among all PhD degree faculty who teach in IS departments and related fields (such as information schools or departments of informatics). According to studies published in the past decade, women represent as much as 25 percent (Mangold et al., 1998) or even 31 percent (Kimery et al., 2003) of all IS faculty. If these figures accurately reflect women’s representation among PhD-level IS faculty, this would indicate that women have not achieved parity with men. However, there are many problems with such estimates of 25 percent to 31 percent women IS faculty, including the fact that these figures are not restricted to Ph.D-level faculty; instead, they likely include those lacking PhD degrees who are employed as non-tenure-track instructors and faculty teaching in two-year community colleges. Without accurate numbers that can show the proportion of women among Ph.D-level faculty employed in four-year academic institutions, we are unable to determine whether the figure that we cited in our earlier study of women publishing 14-16 percent of IS academic papers in a set of 12 journals (Gallivan and Benbunan-Fich, 2007) reflects gender parity or not.

With this paper, we hope that we can draw more attention to these issues and encourage other researchers to conduct gender-informed studies of IS scholarship. Regarding the five areas of studies that we reviewed above, there are obviously distinct strengths and weaknesses associated with each class of studies. For example, while it is easy to analyze descriptively whether women publish more today in IS journals compared to a few decades ago (e.g. Kimery et al., 2003), such studies do not account for changes in the underlying baseline of women researchers in the IS field. Thus, simply showing that women IS faculty publish a greater proportion of papers today compared to 20 years ago provides no evidence of greater gender parity, unless we consider the growth in numbers of women earning PhD degrees in IS and related subjects. While a cohort-type study would obviously be ideal for comparing the publication rates of men and women IS faculty, the lack of a comprehensive, up-to-date list of PhD-level faculty
is a serious constraint on our ability to apply the cohort technique to assess women’s relative achievement, despite the fact that cohort studies are common in other fields[15].

Limitations and conclusion
There are some limitations of our study that we must acknowledge. First, the literature we review deals primarily with social science disciplines, including business and economics. Our literature review also identified many empirical studies of gender and research productivity conducted in fields other than business and social sciences – such as biochemistry (Long, 1990; Xie and Shauman, 1998), other “hard sciences” (Prpić, 2002), and in the arts and humanities (Ginther and Hayes, 2003). In order to limit the scope of literature that we reviewed, we focused on studies of business and social science scholars. We also limited our review to just those studies that comparatively analyzed research productivity and other academic career outcomes for men and women. This means that other studies that focused just on women in a specific academic field (e.g. how mentoring can help women to advance in their careers) are not covered in our review. We made the decision to restrict our survey to comparative studies only (i.e. studies that specifically analyzed or controlled for gender, thus comparing achievements of men and women), in order to make this literature review tractable. There are many high-quality studies that focus just on women in science (Etzkowitz et al., 2000; Rosser, 2004; Xie and Shauman, 2003), as well as studies examining initiatives that facilitate women’s progress in IS specifically (Robertson et al., 2001).

There are further avenues to extend this work and relate it to studies of career development in academia. While it is obvious that differences exist between fields (e.g. management seems to exhibit no gender discrimination in hiring and tenure; in contrast, discrimination in hiring may occur in accounting departments, and discrimination against granting tenure to women in economics apparently occurs as well). It goes without saying that different patterns of scholarly achievement by gender may also exist in different geographic regions. For example, in the same field, there may be few barriers to women in one country, and many such barriers elsewhere. We encourage researchers to conduct various types of analyses suggested by our review – although ideally, limited to the last three classes of studies. For example, we draw attention to one study that previously examined salary compensation patterns for IS researchers (e.g. Gill’s (2001) study of marginal compensation per published article). While this is an interesting study, in terms of estimating the increased salary per published journal article, it did not analyze (or even mention) gender. Thus, it may be valuable to conduct comparative analyses of salary compensation that control for gender and scholarly output; such studies have rarely been conducted for faculty in business schools – other than for economists (see Gomez-Mejia and Balkin, 1992, and Sayre et al., 2000, for two exceptions). Such salary studies have been published only in the humanities (Ginther and Hayes, 2003), in the “hard sciences” (Levin and Stephan, 1998) and, of course, for economists (Ginther and Kahn, 2004). This area of future inquiry may hold other clues to explain the observed productivity pattern among IS scholars.

As we mentioned in our Introduction, other aspects of IS faculty diversity are open to investigation, such as race and ethnicity (Allen, 1997; Payton et al., 2005), citizenship,
and marital status (Price and Price, 2006; Sax et al., 2002), although we presently lack any data or ability to code for such variables among IS faculty. To our knowledge, the necessary data on race, ethnicity, citizenship or country of origin, and marital status that would be required to conduct such analyses are not maintained for IS faculty by any source. The mere collection of such data would be controversial – although it has obvious value to those who seek to understand whether potential bias or different experiences exist in hiring, publishing, or tenure for different racial/ethnic groups. Moreover, the numbers of PhD recipients from certain minority groups may be so small that a researcher attempting to assess whether parity exists among members of different racial and ethnic groups in IS would encounter problems of sample bias (due to small numbers) that would hinder their efforts to investigate these questions. In this paper, we have sought to open a dialogue about gender as a valid issue for investigation with regard to career outcomes for IS academics – including but not limited to publishing. We encourage other researchers to build upon our work. We are now in the process of conducting an empirical study that leverage several of the propositions stated above to analyze potential differences between men and women in terms of research productivity and citation counts. We encourage other researchers to conduct studies that test other propositions from our study, as well.

Notes


2. Carol Saunders was Editor-in-Chief at MISS Quarterly from 2005-2007; Sirkka Jarvenpaa was Editor-in-Chief at Journal of the AIS and is now Co-Editor-in-Chief at Journal of Strategic Information Systems, and Eleanor Wynn has been Editor-in-Chief (or Co-Editor) at Information Technology & People for over a decade. Moreover, the ratio of women Senior Editors is 30 percent at ISR and 22 percent at MISS Quarterly, as of 2007. Comparable figures for Associate Editors are 24 per cent at ISR, 23 percent at MISS Quarterly, and 40 percent at Information Technology & People.

3. A study of UK marketing faculty (Diamantopoulos, 1996) had a response rate of 46 percent and included specific gender analyses which concluded that women marketing faculty publish less than men. Similarly, a study of accounting faculty (Buchheit et al., 2000) had a response rate of 58 percent, conducted a gender analysis, and found no gender differences in research productivity (either for total publications, for journal publications, or for top-ranked journals). The latter study found one gender difference, whereby women faculty at schools without PhD programs published fewer papers than their male peers. Barbezat (2006) had a high response rate (48 percent) and conducted an analysis of non-response bias, but concluded that women economists publish at the same levels as men in their field.

4. A web site that lists surveys administered on ISWorld is available at: www.isworld.org/isworldarchives/research.asp

5. For instance, Clark and Warren (2006) identified Heather Smith, Steve Alter, and James McKeen as the three most productive IS researchers, with 21, 18 and 18 published papers, respectively. A detailed breakdown of papers published in the seven journals featured in their study reported that all 27 of Smith and McKeen’s papers (and 17 of Alter’s 18 papers) were published in Communications of the AIS – a journal that is known to offer authors the option of a “light” review process (Wagner, 2004).
6. These were in accounting (Hasselback, 1998; Daigle and Arnold, 2000) and library/information science (Meho and Spurgin, 2005).

7. James Hasselback publishes print directories that list faculty worldwide in ten disciplines: accounting, computer science, economics, engineering, finance, hospitality, management, marketing, business law, and nursing. See www.facultydirectories.com.

8. Matched pair studies used all female members of the cohort, and identified a male member of the cohort who was similar in background to each woman in terms of type of university in which they were employed, PhD program rank, etc.

9. Dwyer (1994) examined six measures of research productivity for each researcher, controlling for total number of publications before these individuals received their PhD degrees. These included total publications, and papers in scholarly journals and practitioner outlets. She used two methods for counting publications: normal counts (treating each published paper as one paper) and adjusted counts (which uses a fractional count for co-authored publications). Dwyer concluded that women had fewer publications than men on four of the six output metrics she used (including papers in academic journals). On the other hand, women published equivalent numbers of papers in practitioner outlets.

10. Gender discrimination in hiring is a separate issue. In studies that examine the relationship between gender and research productivity neglect to control for these factors (e.g. the research orientation of the university and type of job – whether tenure-track or instructor), they may conclude that women are less productive than men when, in fact, it may be that women were subject to discrimination at the hiring stage and hence, less likely to occupy positions in research-oriented universities.

11. Another control variable often included in analyses of research output is whether the individual had already published in a journal before receiving the PhD degree. Since women are less likely to publish during their PhD studies (Price and Price, 2006), including the construct publication during PhD studies is often statistically significant. While some studies included this construct as a covariate (Dwyer, 1994; Barbezat, 2006), we discourage this practice, since doing so may distort the effect of gender on research output. Including publication during PhD studies as a covariate may underestimate the effect that gender exerts on research productivity after completing the PhD degree.

12. The MIS Research Center at the University of Minnesota compiled data for a North American MIS Faculty Directory on a triennial basis, but the last edition was published in 1995. No directory has been published since 1996. A European Faculty Directory was published once, in 1993. The MISRC at University of Minnesota also compiled lists of PhD degree recipients and published them annually in MIS Quarterly, up through 1998 (Hamilton and Davis, 1998). However, these lists included just the first initial and surname of all PhD recipients in IS, rather than full names.

13. Park and Gordon (1996) include a figure showing that women published more papers, on average, than men during years 1-5 after receiving their PhD degrees, but the men caught up in years 6 and 7. Park and Gordon neglected to mention whether they conducted any test of statistical significance associated with their claim that women published more papers in years 1-5; however, in their analysis of total number of publications for the entire seven-year period, they found no significant difference. Thus, it is unclear whether the higher research output that they reported for women in years 1-5 was statistically significant or not. This detail is crucial to interpreting their results, since it forms the basis for the authors’ claim that women in strategic management face discrimination in promotion and tenure.

14. Blackaby et al. (2005) conclude that men accrued more financial value by securing competing job offers from other institutions than women – implying that men were successful in converting such competing offers into higher salaries in their current jobs, while women were unable to do so. Whether such an effect constitutes discrimination is open to question.
15. One potential source for identifying cohorts of IS graduates might be the annual list of PhD dissertations in IS, published in *MIS Quarterly*. *MISQ* published an annual list of PhD dissertations by students in specific IS programs or related dissertations in other fields such as information science, management, marketing, etc. There are three limitations with this source of data: first, gender is not recorded; second, the authors’ first names are not provided (but only the first initial); and third, publication of this list was discontinued in 1998 (see Hamilton and Davis, 1998, for the most recent list).

References


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