

Chapter 10

Gender Differences in Research Scholarship Among Academics: An International Comparative Perspective

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10.1 Introduction

A comparison of two comparative surveys undertaken in 1992 (Carnegie survey) and in 2007/2008 (CAP surveys) shows considerable changes in the demographic distribution of academics. In particular, the proportion of female academics has increased in almost all participating countries (except Mexico). For instance, the figure increased from 8 % to around 17 % in Japan, which has the lowest proportion of female academics (Arimoto 2008). In the U.S., the proportion of academic women rose from 36 % to 42 % (Finkelstein and Cummings 2008). In the latter survey, the proportion of female academics was 59 % in Argentina and 57 % in Australia, in contrast to only 17 % in Japan and 18 % in Korea.

Demographic factors, including gender, have been frequently observed only as control variables in many studies regarding academics issues (Teodorescu 2000; Horta et al. 2012). However, as Keller (2001) points out, demography is one of the most important variables at the individual and institutional level for deciding academic issues such as their teaching and research activities. In particular, gender is a powerful factor not only in terms of pathways to particular professions but also in relation to processes operating within workplace practices, such as discrimination screening and opportunities for promotion (Poole et al. 1997).

The interest in gender issues in academia was linked to minority issues in the U.S. Initially, these issues were mainly related to topics of discrimination in terms of employment barriers and the salary gap between male and female academics (Toutkoushian and Bellas 2003). There have been substantial empirical studies regarding the differences in scholarship between male and female academics (Bellas and Toutkoushian 1999). Previous literature about gender issues can be summarized as looking into several of these issues. First of all, many studies, including one by

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Bellas (1994), have proven that there is an unequal job market for female academics. Second, beyond mere hiring issues, some studies have proven that women remain disadvantaged in terms of promotion, tenure, and salary (Bellas 1997; Preffer and Davis-Blake 1987). Third, studies have shown that there exist practical career barriers for female academics, such as family and children (Gmelch et al. 1986). In addition, female academics have lower job satisfaction and higher stress (Hagedorn and Sax 1999). Fourth, studies have shown differences in the teaching and research activities of women and men. The most common finding was that female academics are more involved in teaching activities, while their research performance is lower than that of male academics (Sax et al. 2002). Different explanations regarding teaching effectiveness and research productivity between male and female academics have been put forward. For instance, Poole et al. (1997) argue that female academics are more person-oriented and that they value social, communication and interaction patterns associated with teaching. In contrast, Olsen et al. (1995) suggest that the gender differences are not so much merely a matter of personal preference and orientation but are equally a product of institutional requests or demands. Finally, there have been recent studies concerning management and governance issues, such as the decision-making participation of female academics in universities and the lack of female academics in high positions, an issue related to the “glass ceiling.” As such, women still have limited opportunities to formulate university policies as presidents, vice presidents, academic deans, and department chairs (Bornstein 2008).

This study focuses on how research scholarship is different between male and female academics. It examines differences of gender issues in academia according to higher education systems (see also Bain and Cummings 2000). Five countries (Australia, Brazil, China, UK and the U.S.) are chosen to explore in detail the differences in research scholarship between male and female academics. Moreover, this study raises additional questions, such as (1) “Is research productivity among female academics generally lower than that of male academics?” (2) “Is this difference simply a gender issue or are their contextual factors that are more important?” and (3) “Does it come from their individual profile or academic discipline?”

10.2 Literature Review

10.2.1 *Individual and Institutional Profiles Among Male and Female Academics*

Gender issues in academia vary from those about previous educational backgrounds and experiences to current teaching and research activities and working conditions. Prior research has shown that male and female academics have slightly different profiles, not only in terms of educational background but also in terms of the institutions where they are employed. These profiles need to be examined because factors such as employment status have an impact on academics’ perception and the practice of their work.

First of all, women are less likely than men to hold a doctoral degree, and they have fewer years of academic experience than men. For instance, the proportion of Japanese academics holding a PhD degree was 60 % for males and 25 % for females in 1992. The gap did not disappear, but was smaller in 2008 with 75 % of men and 50 % of women (Arimoto 2009). Toutkoushian and Bellas (2003) point out, that differences between men's and women's educational attainment partly explain the gender gap in employment.

Second, there have been studies regarding faculty employment status. Men are more likely to be in secure, tenured positions, whereas a higher proportion of women have short-term or part-time contracts (Poole et al. 1997). Among academics in the UK, the proportion of women academics with full-time positions was 37 %, while the proportion with part-time positions was 53 % (Locke 2008). However, as Toutkoushian and Bellas (2003) indicate it is unclear whether the greater percentage of women with part-time employment reflects individual preferences or responses to blocked opportunities and discrimination.

Third, male academics tend to have more experience with international mobility than women, though there are only a few studies about gender differences regarding internationalization. Poole et al. (1997) have shown that there exist gender differences in terms of international experience among academics since their appointment to a professor position. They suggest that men are given greater access to travel abroad and research-related internationalization.

Fourth, a greater proportion of male academics are employed at research-oriented universities, whereas more female academics often work at teaching-oriented universities or other types of higher-education institutions. This holds true, for example, for Japan where women comprise only 6 % of the academics at research universities (Daizen and Yamanoi 2008). In Hong Kong, women comprised 27 % at research oriented universities in 2007 as compared to 38 % at other institutions (Postiglione and Tang 2008).

10.2.2 Research Scholarship Among Male and Female Academics

Though all faculty members are expected to teach, research, and do service, currently the decisive factor in tenure and promotion decisions is research. Therefore, the main gender issues will be discussed specifically here with respect to research scholarship. The term research scholarship in this study is used broadly to include not only research productivity but also perceptions of research and actual research activities.

It has been stated that women academics have “less time, energy, and commitment to invest in their professional careers and are therefore less productive scientifically than men” (Toren 1993: 72). This implies that women are less oriented to research. Women are also perceived as being less concerned with, or as underutilizing, institutional resources (Davis and Astin 1990). In addition, prior analyses of the CAP survey have shown that interests in teaching and research are different

between male and female academics. For instance, in Argentina, men prefer research activity (9 %) or both, teaching and research, ‘with a leaning towards research’ (49 %), while the respective aggregate figure is 51 % for women (Marquina and Lamarra 2008).

Such a pattern is also revealed in terms of workload. Men, on average, devote a higher portion of their time than women to research activities, whereas women spend a higher percentage of their time than men on teaching and service activities (Park 1996). Female faculty members are more likely than their male counterparts to be involved in undergraduate teaching and service and, consequently, are less engaged in research (Mamiseishvili and Rosser 2011).

These preferences and time investments are directly related to research productivity (Shin and Cummings 2010). Women academics publish less than men academics (Bellas and Toutkoushian 1999; Sax et al. 2002; Toutkoushian and Conley 2005). In 1979, Cole reported that men had on average 1.6 times as many publications as women (Cole 1979). A decade later, the gender gap in publishing rates remained significant. From 1986 to 1988, men published almost twice as many articles and books as women. In 1989, 35 % of men, but only 13 % of women, had published 11 or more articles in professional journals, and 49 % of men, but only 36 % of women, had ever published or edited a book (Boyer 1992). Toren (1993) and Billard (1994) report that women college and university faculty members publish less than their male counterparts, that women’s scholarly work is generally regarded as being of a lower quality, and that they are rarely cited as having made scholarly contributions. The most recent study of Horta et al. (2012) specifically indicates that men produce 8 % more articles in refereed journals than women in the U.S., but no gender differences are perceived in the other types of outputs. In addition, according to current research by Postiglione and Jung (2012), who studied top-tier researchers in Asia, approximately 90 % of highly productive researchers are male academics.

This state of affairs is also significant in terms of differences in research collaboration patterns. Building relationships with co-workers can be a challenge for women academics (Aguirre 2000). For instance, O’Leary and Mitchell (1990) report that even those women who did attend meetings reported fewer productive conversations leading to collaboration compared to men. They also report on the existence of an invisible college, an old-boy network whose members “functioned as gatekeepers, controlling finances, reputations, and the fate of new scientific ideas.” Women academics have been found “to be less well integrated into their academic departments and disciplines than men” because they lack mentors and networks, that can assist in professional integration and productivity (O’Leary and Mitchell 1990).

10.2.3 Gender Issues Concerning Academic Rank and Academic Disciplines

Based on previous studies regarding gender and research performance, this study raises the question, “Are male academics always more productive than female academics in terms of research scholarship?” Davis and Astin (1990) raise questions

about the subtle biases and contextual factors that affect scholarship for men and women. Thus, this study tried to include contextual factors that influence gender differences between male and female academics. To do this, it started with two questions. First, is the productivity gap between male and female groups the same regardless of academic rank? In the current system, there are many male academics in senior positions. Bain and Cummings's study (2000) examined ten university systems and showed that females constitute one-third of all academics, but among full professors only one of every ten is a woman. However, the educational level of female academics has been considerably enhanced recently and the labor market available to female academics has expanded over the last decades. Thus, we can currently find many female academics in junior positions.

Differences between women and men in terms of years of experience have led to further reductions in the gender gap. In addition, publication rates among women faculty have increased significantly in recent decades (Sax et al. 2002), and there has been some narrowing of the gender gap over time (Ward and Grant 1996). Rank is highly relevant in academia because academic identity, scholarship, and interpersonal relationships can change according to one's position or length of service. For instance, seniority is a significant factor in academic careers; the behavior and performance of academics is recognized through their networks, resources, and their power within their higher-education institution and within the academic community at large (Jung et al. 2013).

This can be shown in several ways. In Finland, it is common to have more men than women in higher academic posts, but in lower academic posts, the proportions are inverted. For example, in universities of applied sciences, slightly less than one-fourth (24 %) of professors are female, yet 41 % of principal lecturers and 63 % of lecturers are female (Aarvevaara and Holttta 2008). In Australia, a higher proportion of female academics (19 %) are employed part-time than of male academics (12 %), while the rate of short-term employment is similar among women and men. In terms of rank, Australian male academics are more likely to occupy higher academic ranks than female academics. In Japan, the proportion of women among academics increased over time; however, men continued to be more highly represented in senior positions as well generally in research universities (Daizen and Yamanoi 2008).

The second question asked in order to look at contextual factors that influence gender differences between male and female academics was the following: is the gap in productivity between males and females related to academic discipline? Relatively more women academics work in the fields of nursing, library science, and education, in contrast to the more male-dominated fields such as business, engineering, medicine, law, and the military (Bain and Cummings 2000). It is generally noted that the proportion of male academics is higher in hard disciplines (e.g., engineering and the natural sciences), while the proportion of female academics is higher in soft disciplines (e.g., the humanities and education). In addition, the fact that research productivity in hard disciplines is usually higher than that in soft discipline is known from previous empirical studies.

For women in the science to be successful, their interest in publishing research and their competence in conducting successful research need to be extraordinarily high in order to survive in these male-dominated fields (Blackburn and Bentley

1993). According to Bellas (1997), for faculty in highly feminized disciplines in which the work is already devalued, it is plausible that the notion of comparable worth may influence perceptions of the unfair and inequitable institutional treatment of female faculty. Interestingly, the differences in the composition of male and female faculty between fields explain virtually none of the gender differences (Toutkoushian and Bellas 2003).

10.3 Method

10.3.1 Data

This study uses data from the international comparative survey entitled “The Changing Academic Profession,” conducted in 2007–2008. To examine gender differences in the research scholarship of academics, 5 countries were selected from the 19. First, countries that had a sample size of more than 1,000 were selected for analysis. Second, in order to reduce bias from the imbalance of cases, only countries were selected that had approximately 40 % of academics that were female. See the proportion of female academics in all higher education systems analysed in the CAP survey in Fig. 10.1. Third, it was assumed that the academic-scholarship pattern would be different according to each higher education context; therefore,

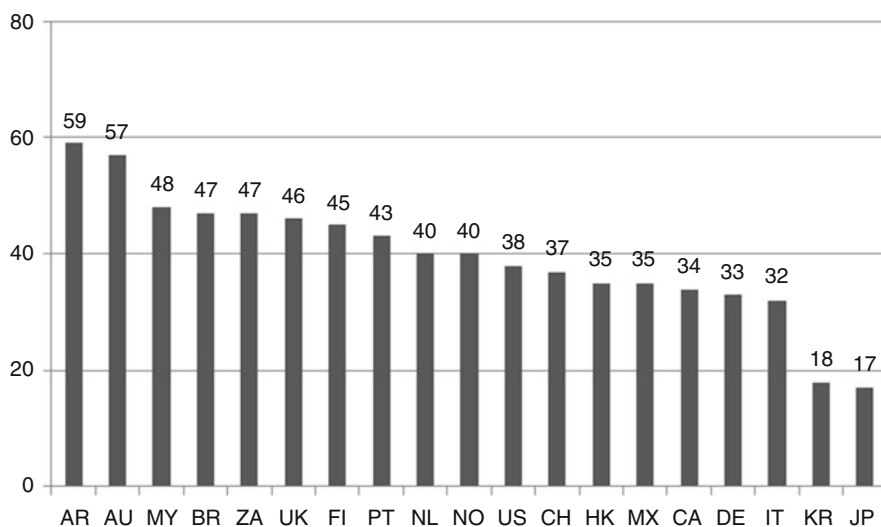


Fig. 10.1 Proportion of female academics in 19 higher education systems. Note: *AR* Argentina, *AU* Australia, *MY* Malaysia, *BR* Brazil, *ZA* South Africa, *UK* United Kingdom, *FI* Finland, *PT* Portugal, *NL* Netherlands, *NO* Norway, *US* United States, *CH* China, *HK* Hong Kong, *MX* Mexico, *CA* Canada, *IT* Italy, *KR* Korea, *JP* Japan (Source: CAP survey)

one country was chosen from each continent. Based on these three criteria, the target group for analysis in this study was chosen to be China, Australia, the U.S., Brazil, and the UK.

10.3.2 Variables and Measurement

This study analyzes the main differences in research scholarship between male and female academics, as well as whether these differences remain once rank and academic disciplines are controlled. First, the profile differences are compared in terms of educational background, such as holding a doctoral degree, and institutional background, such as the type of institution at which they work. Before these academics' research activities are studied, the profile analysis is examined in order to look at whether gender differences are inherent before professorship. Second, to examine and compare research scholarship, this study identifies research scholarship using six dimensions: research preference, time allocation for research, research productivity, research funding, research collaboration, and research service activities. Third, to examine gender in terms of differences in rank and academic discipline, academic discipline is classified into two categories based on Biglan (1973) hard and soft – and academic rank is categorized as being senior or junior. As regards the former, disciplines that have a cumulative and obvious theory, such as the natural sciences, engineering, and medical science, are categorized as hard disciplines, whereas disciplines that have less-defined paradigm structures, such as the humanities, the social sciences, and business, are categorized as soft disciplines. As regards the latter, we adopt the classification employed in the CAP project: senior academics, or “professors,” i.e., those occupying a position equivalent to associate professors and full professors in the US higher-education system and junior academics or “junior staff”, i.e., those in a lower position, such as assistant professors, lecturers, research associates, and assistants. Table 10.1 shows both, the independent and dependent variables of the subsequent analysis.

10.4 Findings and Discussions

10.4.1 Individual and Institutional Profiles Among Male and Female Academics

In examining the individual and institutional profiles of academics, we aim at establishing whether variations between academics of different genders are the inherent result of their backgrounds rather than a consequence of their current performance level.

Actually, as expected, the proportion of male academics with doctorates is higher than that of female academics with doctorates. As Table 10.2 shows, this pattern is common across almost all countries. There are substantial variations, however,

Table 10.1 Variables and measurements

Variables		Measurement
Independent variables		
Gender		Male = 1, Female = 2
Rank		Senior = 1, Junior = 2
Academic discipline		Hard = 1, Soft = 2
Dependent variables		
Individual profile	Doctoral degree	Yes = 1, No = 2
	International mobility experience	Yes = 1, No = 2
	Employment condition	Full-time = 1, part-time = 2
Institutional profile	Types of current institution	Universities: 1, Other HE institutions: 2
Research preference		Preference for research = 1, Teaching = 2
Time allocation for research		Average hours per week
Research productivity	Books, articles, conference, reports granted funding, and patents	Number of papers in previous 3 years
Research funding source	Institution, public, and private	Percentage (%) of each funding source
Research collaboration	Institutional, International	Yes = 1, No = 2
Research services	Peer review for articles, Journal editor work	Yes = 1, No = 2

between countries. The gender gap in the U.S. and Brazil (less than 5 %) is not high, while it is higher in China: male: 37 % vs. female: 21 %.

This finding is similar to that of international mobility experiences. In this study, the definition of international mobility experience includes immigration and travelling for study. The male academics in this study were more internationally mobile throughout their lives and careers than the female academics. Such a gap is significant in the Australian sample, but low in the case of China. In contrast, female academics in the UK are more mobile than men academics.

Finally, a less-favorable employment environment is observed for female academics. Except for the U.S., the proportion of part-time work among female academics is much higher than that of male academics. This difference is substantial in Australia and the UK. The finding seems to be confirmed, when we categorize institutional types into universities and other types of higher-education institutions. However, this gap is not significant.

10.4.2 Gender Differences in Research Scholarship Among Academics

Six aspects of academics' research scholarship have been addressed in this study: (a) Preference for research (compared with teaching); (b) Time allocation for research per week; (c) Research publications: (co-)authored book, (co-)edited book,

Table 10.2 Individual and institutional profiles among male and female academics in five countries

	AU		BR		CH		UK		US		Summary
	M	F	M	F	M	F	M	F	M	F	
Doctorate (%)	404 (79.5)	356 (69.3)	358 (59.1)	293 (54.5)	801 (36.3)	271 (20.8)	469 (68.5)	402 (59.9)	560 (84.8)	385 (81.1)	M > F
International mobility experience (%)	246 (52.0)	182 (38.0)	81 (14.6)	50 (10.0)	54 (3.1)	22 (2.1)	129 (23.7)	146 (27.7)	151 (23.1)	71 (15.2)	M > F (except UK)
Contract: part-time (%)	34 (6.7)	101 (19.8)	269 (44.6)	257 (48.0)	73 (3.4)	34 (2.7)	30 (5.1)	106 (18.2)	40 (6.1)	23 (4.9)	M < F (except US)
Institutional type: University (%)	348 (68.5)	358 (69.6)	298 (49.7)	254 (47.4)	1,878 (85.2)	1,093 (83.9)	521 (92.7)	518 (94.5)	487 (73.8)	352 (74.1)	-
N	508 (37.1)	514 (37.5)	606 (52.8)	538 (46.9)	2,205 (61.0)	1,302 (36.0)	685 (43.8)	671 (42.9)	660 (57.6)	475 (41.4)	

Source: CAP survey

International mobility: including foreign born, early immigrant foreigners, early immigrant citizens, PhD immigrant foreigners, PhD immigrant citizens, Professional migrant citizens, Study mobile academics, and PhD mobile academics

M male, F Female, AU Australia, BR Brazil, CH China, UK United Kingdom, US United States of America

journal article, report from funded project, or conference presentation; (d) Research funding: funding source from own institution, public agency, or private agency; (e) Research collaboration: institutional, international collaboration; (f) Research service activities: peer reviewer, journal editor. A short glance at Table 10.3 suggests an expected gender gap, but the differences vary across variables, and do not hold true for all countries in some instances.

Male academics prefer research more than do female academics. In China, for example, 56 % of male academics prefer research to teaching, in contrast to 31 % of female academics. The respective figures are 48 % and 39 % in the U.S. However, there are not any significant gender differences in this respect in some countries.

Male academics allocate more time to research. The gap ranges from only 0.1 to 4 h per week.

In terms of the number of publications by male and female academics, male academics' productivity is higher than that in the junior group across publication types and countries, except for book publication. In particular, this gap is highly significant with regard to journal articles and conference presentations.

A substantial proportion of female academics obtain research funding from their own institution rather than from outside, including through public or private agency. By contrast, male academics tend to rely on more diverse funding sources.

The proportion of research collaboration is considerably different between male and female academics across countries. Male academics have participated in more collaboration not only inter-institution collaborations but also inter-national collaborations.

Lastly, male academics are highly involved in research service activities, such as peer-review and journal-editing work. The gender gap in this respect is most striking in China (see Table 10.3).

10.4.3 Gender Differences in Research Scholarship Among Academics by Rank and Discipline

Figures 10.2 and 10.3 are presented here to show the extent of gender differences according to rank and disciplines. Actually, information is provided on senior ranks and hard disciplines, i.e. those segments where gender differences are highest.

In our analysis whether academic rank and discipline affect the research scholarship of male and female academics differently, we concentrated on a single country, i.e. the U.S. The findings are documented in Table 10.4.

Gender differences are weaker if analyzed separately by rank than for the whole sample. In particular, there is no significant difference between genders among junior academics in terms of time allocation for research.

The research activity is not significant in the junior group except regarding the sources of research funding: male academics receive a higher proportion of research funding from public agencies. Also, international collaboration and participation as a journal reviewer is significantly higher among male academics than among female academics in the junior group.

Table 10.3 Gender differences among academics in research scholarship in five countries

	AU		BR		CH		UK		US	
	M	F	M	F	M	F	M	F	M	F
Preference (%)										
Research > teaching	71.8	67.6	46.9	49.0	56.3***	30.7	70.7*	63.2	47.9*	39.0
Time allocation (hours per week)										
Research	15.1*	13.2	9.0	8.9	15.0***	11.0	14.3***	10.0	13.7***	10.6
Publications										
(Co) authored books	0.3	0.3	0.5	0.6	0.9*	0.7	0.5**	0.3	0.3	0.2
(Co) edited books	0.2	0.2	0.3*	0.2	0.8	0.9	0.4*	0.3	0.2	0.3
Journal articles	8.5***	5.9	5.1***	3.8	9.5***	6.3	7.8***	4.7	4.8*	3.6
Report from funded project	1.5	1.5	1.4	1.4	1.6*	1.1	1.6***	0.9	1.5***	0.8
Conference presentation	5.9	5.7	6.2*	4.8	2.9***	1.9	6.5***	5.0	6.1	5.2
Research funding sources (%)										
Own institution	36.2	40.6*	15.4	19.1***	40.9	50.1***	36.5	44.4*	50.6	52.3*
Public agency	44.6	42.1	27.2	24.6	37.6*	32.7	45.2	38.3	25.6***	16.2
Private agency	12.9	13.8	6.1*	4.4	-	-	14.0	12.6	13.9	14.4
Research collaboration (%)										
Institutional	67.4	66.3	68.2***	50.4	38.8***	31.5	72.0**	62.5	63.4	56.2
International	64.9***	53.4	37.2***	18.8	14.8***	8.3	68.5***	53.3	36.7*	27.9
Research service activities (%)										
Peer-reviewer	75.0***	69.3	52.2	47.4	20.2***	6.8	74.7***	64.9	69.1*	62.0
Journal/book editor	22.5	18.6	23.0**	15.8	6.9	3.0	28.0**	20.4	21.5	17.1
N	478	471	438	409	1,228	560	437	419	609	424

Source: CAP survey

Time allocation, Publications, Research funding source: T-test

Preference, Research collaboration (%), Academic service (%): Chi-square

M male, F Female

* p < .05; ** p < .01; *** p < .001

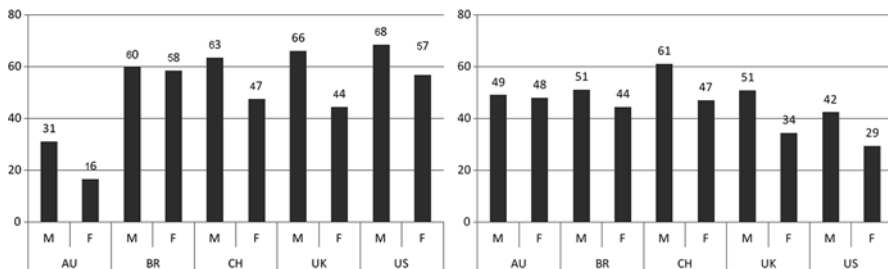


Fig. 10.2 Gender distribution in senior positions in five countries (percent) (Source: CAP survey)

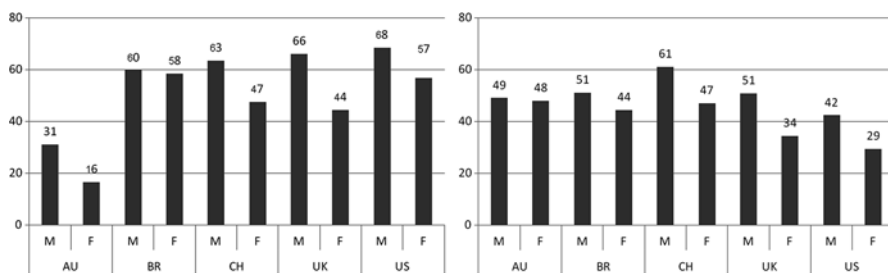


Fig. 10.3 Gender distribution in hard disciplines in five countries (percent) (Source: CAP survey)

Moreover, the gender gap turns out to be large according to this analysis in hard disciplines; however, these differences scarcely appear in soft disciplines. However, gender difference in terms of the number of articles published, which is the most powerful research performance indicator, is weaker if it is controlled by academic discipline. In particular, in soft disciplines, gender differences are rare except with regard to generating reports from funded projects and funding from public agencies.

10.5 Discussions and Conclusion

The analysis focusing on eventual differences of the gender gap by country, academics' rank and by discipline provides evidence that some gender issues can be found across countries.

For example, some differences exist more or less consistently in terms of their educational background, employment status, and working institution. Higher proportions of male academics hold doctoral degrees and have more international experience. Moreover, a higher proportion of male academics hold full-time positions and work in research universities, compared to female academics. These results confirm what previous studies have shown (Kirshstein et al. 1997). Although

Table 10.4 Gender differences in research scholarship among academics in the U.S. by rank and discipline

	Gender	Gender and rank		Gender and disciplinary group	
		Senior	Junior	Hard	Soft
Preference					
Research > teaching	M > F*		M > F*	M > F*	
Time allocation					
Research	M > F***				
Publications					
Co-authored books		M > F*		M > F*	
Co-edited books					
Journal articles	M > F*	M > F*			
Reports from funded project	M > F***	M > F***	M > F*	M > F*	M > F*
Conference presentations					
Research funding sources (%)					
Own institution		M < F*		M < F*	
Public agency	M > F***	M > F***	M > F*		M > F*
Private agency					
Research collaboration (%)					
Institutional					
International	M > F*	M > F*		M > F*	
Research activities (%)					
Peer reviewer	M > F*		M > F*	M > F**	
Journal/book editor				M > F*	

Source: CAP survey

M male, F Female

*p < .05; **p < .01; ***p < .00

there has been much progress in the job market for female academics, it is still common for male academics to have preferable working conditions. This is confirmed by their research scholarship: male academics tend to be more active in terms of performance, collaboration, funding, and research service. Teodorescu (2000) had already indicated that women receive fewer grants than men and are employed disproportionately in disciplines that have an article productivity that is lower than average.

Numerous hypotheses have tried to explain these differences in terms of biological, cultural, structural, and psychological factors. For instance, these differences in research productivity have been explained as being the result of women’s structural positions in universities: “women carry heavier teaching loads, bear greater responsibility for undergraduate education, and have more service commitments. Women also have less access to graduate teaching assistants, travel funds, research money, laboratory equipment, and released time for research” (Park 1996: 55). Some studies claim that women are simply not socialized to be career oriented or ambitious to the same degree as men. Certain tasks, such as managing money, may

be considered more masculine, whereas other tasks, such as dealing with clients, may be considered more feminine, thus replicating gender stereotypes that exist outside the corporation (Park 1996: 47).

However, this study considers contextual variables such as academic rank and discipline. It shows that the gender gap is smaller than it seems to be at first glance, if one compares women and men within the same rank and the same disciplinary group.

Yet, there remain substantial gender differences in some respects. Male academics receive much more funding than female academics and male academics participate much more in collaborations, even when academic discipline is controlled. This collaboration pattern is ultimately related to research performance, given that research collaboration is highly correlated with research productivity (Katz and Martin 1997). This discussion touches on issues regarding the strength or weakness of academic networks among male and female academics. According to O'Leary and Mitchell (1990), while women have networks, they do not benefit that much professionally: "women who reported low connectedness with the old boy network saw themselves as operating on the periphery of their disciplines which resulted in difficulty in obtaining resources for their work, getting published, and earning recognition" (O'Leary and Mitchell 1990).

Altogether, we note a substantial gender gap, if we look at aggregate data. Women have less often a doctoral degree, are less often in advanced positions, are less frequently international mobile, and are less strongly represented in the financially most favored disciplines.

Male academics prefer research, invest much more time in research, have higher publication rates, have diverse funding sources, and are involved in a greater number of international collaborations and academic service activities. These features are common across countries, even though the proportions are different. Moreover, while female academics' efforts and outputs have improved in the last decades, women continue to have network-related issues: they show less involvement in networks.

This study showed that differences are smaller or partly non-existent, if controlled by various features of the composition of male and female academics. Further, investigations might be helpful in examining factors explaining causes for different types of workload.

Thus, more detailed analysis might help to understand the strengths and weakness of female academics in order to improve gender-related policies.

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