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Is there gender bias in research grant success in social sciences?: Hong Kong as a case study

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Despite growing attention to gender disparities in higher education, women in academia still receive less research funding and recognition. Previous research on this gender gap has focused on biomedical, science, technology, engineering, and mathematics in the West—relatively silent on social sciences and Asia. This study examined how well staff gender, submission rate, success rate, and amount per award could predict annual changes in the number and amount of grant funding for academic years 2015/2016–2020/2021 in the Faculty of Social Science at the University of Hong Kong, a leading institution in social sciences in Asia. Decomposition analysis revealed that, compared to men, women had higher submission rates, which significantly contributed to an increase in the number of awards for the University in recent years in two major funding mechanisms (namely, General Research Fund and Early Career Scheme), especially from 2019/2020 to 2020/2021. Women also outperformed men in the success rate in the Early Career Scheme (i.e., within the first three years of faculty appointment). Both submission rate and success rate contributed to changes in award number and the total amount for the University over time. Overall, women had a higher submission rate, successful rate, and amount per award than their male counterparts. We have identified good practices and distinctive contextual factors in Hong Kong that likely contribute to the lack of gender bias for research grant application results in Social Sciences.

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Introduction

Gender disparity has been noted and debated across research domains, disciplines, and countries for over two decades (Ding et al., 2006; Symonds et al., 2006; Larivière et al., 2013; Shen, 2013; West et al., 2013; Sheltzer, 2018; Grogan, 2019; Witteman et al., 2019a; Xiao et al., 2020). Women in academia take longer to publish and receive less credit (Symonds et al., 2006; West et al., 2013; Grogan, 2019). Woman-led articles get fewer citations even in high impact journals (Larivière et al., 2013; Ghiasi et al., 2015), and women are less represented among journal referees (Lerback and Hanson, 2017). In terms of recruitment and promotion, women academics are not only less likely to be hired as new faculty members (Moss-Racusin et al., 2012; Sheltzer, 2018), but also under-represented in senior professorial and managerial roles in higher education institutions (HEIs; Ovseiko et al., 2016; Xiao et al., 2020). In particular, gender disparity persists in biomedicine (Edmunds et al., 2016; Sheltzer, 2018), science, technology, engineering, and mathematics (STEM; Holmes et al., 2008; National Research Council, 2010; Finkel, 2013; Latimer et al., 2019). Underrepresentation of women in the academia has prevailed in the United Kingdom (UK; Bedi et al., 2012; Schmidt et al., 2020), the United States (US; Pohlhaus et al., 2011; Ginther et al., 2016), Australia (Finkel, 2013), Canada (Witteman et al., 2019a, 2019b), Denmark (Watson and Hjorth, 2015), and China (Postiglione and Tang, 2008; Aiston, 2014; Ma et al., 2018; Aiston et al., 2020).

In response, gender-equity initiatives, such as the Athena SWAN of the Equality Challenge Unit (ECU, 2019a) in the UK and the ADVANCE program of the National Science Foundation (NSF, 2001) in the US, were launched to promote gender diversity and equity (DeAro et al., 2019). HeForShe University IMPACT Champions across eight countries and five continents, under the United Nations' auspices, set out to promote gender-equal campus since 2016 (UN Women, 2016). Yet, despite advocacy and debates, imbalance persists. Proactive structural and climate changes in HEIs, funding organizations, and societies at large are still much needed (Zakaib, 2011; Nielsen et al., 2018).

Research grant funding seems to be a key driver of gender inequality in academia (Boyle et al., 2015). Research grants are essential for academic career success (Bedi et al., 2012; Witteman et al., 2019b). In particular, funding received in an early career significantly contributes to retaining female scholars in the academic pipeline (van den Besselaar and Leydesdorff, 2009; Zhang et al., 2018). Successfully securing research funding in the early stage of the tenure-track is key to get tenure and promotion and considered an important criterion for research excellence (Jung, 2012; Aiston, 2014). Gender diversity in funded research can also drive scientific innovation, team development, and ultimately enhance research quality (Nielsen et al., 2018; Witteman et al., 2019a).

Prior studies in biomedical and STEM fields have consistently revealed gender disparities in grant submission and success rates (Bedi et al., 2012; McAllister et al., 2016; Burns et al., 2019; Grogan, 2019; Witteman et al., 2019a). An analysis of research grants from the Wellcome Trust, a major funder in the UK, showed that fewer women applied for grants, and those were awarded received much smaller grants on average than did men during 2000 and 2008 (Bedi et al., 2012). Similar grant-seeking gender disparity was observed for the Canadian Institutes of Health Research (CIHR) Foundation (Burns et al., 2019; Witteman et al., 2019a), the US National Institutes of Health (NIH), and NSF (Pohlhaus et al., 2011; Hechtman et al., 2018; Grogan, 2019), and across Europe (Watson and Hjorth, 2015; Bautista-Puig et al., 2019). For example, in Denmark, even taking into account of the "Younger women Devoted to a UNiversity career" (YDUN) research awards, male principal investigators on average

still received a greater grant amount than their female colleagues (Watson and Hjorth, 2015).

Beyond STEM disciplines, however, gender disparity in research funding was less consistently reported. One meta-analysis, including science, social science, and humanities grants, found male applicants had a success rate of 7% higher than female applicants (Bornmann et al., 2007). Similar results were reported for NIH RO1 grants in the US (Kaatz et al., 2016) and the Australian Research Council's Discovery Grant (Symonds et al., 2006). On the other hand, a large study found no gender disparity in grant success in the US (Marsh et al., 2011; Pohlhaus et al., 2011; Forscher et al., 2019).

To date, relatively little is known about gender parity for non-STEM disciplines and even less for such disciplines in Asia. One study on UK Economic and Social Research Council (ESRC) research grants revealed no gender difference in social scientists for success rate and award size. Among junior academics, women indeed seemed slightly more successful than men (Boyle et al., 2015). Why might gender parity in research funding be better for social sciences than STEM disciplines? Candidate explanations include higher female representation (which disrupts conventional gender expectation in responsibilities and hierarchy), engagement of feminist or at least less gender-stereotyped research practices (which disrupts male power dominance), and creation of critical knowledge of awareness (which encourages male social scientists to share a respect for female scholars; Boyle et al., 2015).

To date, published research remains quite silent on gender (dis)parity in funding practice and success for social sciences in a non-Western context. One might expect gender inequality to be more severe in Asia due to Confucius's teaching and traditional male domination (Chang et al., 2019). Will the slight female edge for social sciences observed in the UK exist in a more patriarchal society (e.g., Chinese culture)?

Hong Kong provides a unique case internationally to explore the position of academic women. Hong Kong culture is considered a mix of East and West. While the traditional Asian culture still emphasizes women's role as wives, mothers, and homemakers (Luke, 2000), interacting with other cultures has weakened male dominance in the families and work environments in Hong Kong (Postiglione and Tang, 2008). As a leading International Financial Center, Hong Kong embraces economic and academic freedom, and the universities in Hong Kong have consistently demonstrated excellence in research (Aiston and Jung, 2015). Research in Hong Kong has been found to be highly internationalized and well-recognized (Jung, 2012; Tang, 2018, 2019), as indicated, for instance, by Quacquarelli Symonds (QS) rankings of universities.

Hong Kong also distinguishes itself from many global counterparts because most middle-class families employ live-in foreign domestic helpers, resulting in the less gendered division of labor at home for the employers. Female academics and other professionals in Hong Kong may well have fewer household chores than their counterparts overseas. In addition, Hong Kong Labor and Welfare Bureau successfully extended maternity leave from 10 to 14 weeks in Hong Kong, with 80 percent of the mothers' wages covered.

Despite the interesting interplay of these cultural factors, research on gender (dis)parity regarding research grant funding in Hong Kong remains limited (Aiston, 2014). Most existing studies hark back to the 2008 Changing Academic Profession (CAP) survey, which found that women published less than men in general. Yet, Aiston (2014) found that women in the humanities and social sciences (HSS) at both senior and junior levels reported more likely to publish peer-reviewed articles. The latest

CAP survey was done in 2008 also revealed that women received less public research funding than men (Teodorescu, 2000; Jung, 2012; Aiston, 2014; Aiston and Jung, 2015). Based on interviews with 16 established female professors in HSS, Ruan (2020) identified managerial and neoliberal practices in universities as major obstacles and biases that diminish research opportunities for women academics in Hong Kong. Major questions remain: Are there measurable gender differences in public research funds in social science disciplines in terms of submission rate, success rate, and average award size? Do their contributing factors differ for men and women?

In the present study, we focused on how characteristics of eligible applicants (e.g., gender, career stage, submission rate) might predict success rates and award amounts for government funding in the Faculty of Social Sciences (FOSS) at the University of Hong Kong (HKU). Known for its academic excellence, HKU ranked 22nd in the overall QS ranking (Quacquarelli Symonds, 2020), and 35th in the Times Higher Education (2020) World University Rankings. FOSS in HKU ranked 3rd in Asia, with about 100 faculty staff eligible to apply for government research grants. It has five departments (i.e., Geography, Politics & Political Administration, Psychology, Social work & Social Administration, Sociology) and one center (Journalism and Media Studies Center). Founded in 1911, HKU is the oldest University in Hong Kong; its FOSS could be a useful reference for universities in Asia.

Our study also took into account of career stage. Early-career female applicants have been found comparable to male applicants in submission and success rates and grant amounts. Still, women received fewer research grants when they moved to more senior positions (Boyle et al., 2015). For grants with longer project duration in particular (e.g., ROI in the US), male researchers have a higher success rate and larger award amounts (Pohlhaus et al., 2011). The Research Grants Council (RGC) of Hong Kong under the University Grants Committee (UGC) has two major funding mechanisms for all disciplines: General Research Fund (GRF) and Early Career Scheme (ECS) awards (University Grants Committee, 2020d). For GRF, all academic staff (Professors, Associate Professors, Assistant Professors) who have a full-time appointment in a UGC-funded institution (University Grants Committee, 2020c) are eligible to apply. ECS applicants, however, are restricted to Assistant Professors (or equivalent) who are within the first three years of their full-time academic appointment (University Grants Committee, 2020a). To better understand the gender parity in research funding performance, which can be related to the career stage, we investigated GRF and ECS applications and outcomes separately.

We pay particular attention to four “myths” about *why* gender disparity existed in research funding for STEM and biomedicine (Mejia, 2010; Zakaib, 2011; Shen, 2013; Ovseiko et al., 2017; Ma et al., 2018; Sheltzer, 2018).

Myth 1: Men are better represented among faculty members (staff gender ratios).

Myth 2: Men are more likely to submit grant applications (submission rates).

Myth 3: Men’s applications are more likely to succeed (success rates).

Myth 4: Men won larger research awards than women (award amounts)

This study, therefore, examined gender (dis)parities in research funding by focusing on gender ratios of eligible staff, submission rates, success rates, award amounts, and how these changed over five successive pairs academic years from 2015/16 to 2020/21. We used the decomposition method (Yip et al., 2017) to segregate each effect, namely, the number of staff, submission rate, and successful rate from the overall effect, separately for GRF and ECS

by gender in FOSS at HKU. The decomposition method allowed us to examine the impact of individual predictors empirically on the successive annual changes in the number of awards and award amounts during the study period (2015/16–2020/21). In the latest research grant exercise (2020/21), HKU has secured the highest number of approved projects in the GRF and ECS schemes overall, the largest share of funding in both schemes, and the highest number of funded projects specifically under the Humanities & Social Sciences Panel among the eight UGC-funded universities (University Grants Committee, 2020a). Therefore, the HKU database offered a substantial amount of data on the variables of interest in this study.

Methods

Data and measures. To identify annual changes in grant funding in FOSS at HKU, the eligible numbers of applicants, submission rates, success rates, and total funding amounts separated by gender from 2015/16 to 2020/21 were obtained from the FOSS at HKU and were analyzed in order to improve research funding performance. The data were stratified by GRF and ECS among the eligible staff. Gender information was based on applicants’ self-reports on the grant applications. Approval was obtained from the Human Research Ethics Committee at HKU (HREC Reference Number: EA200125).

Outcomes. Two grant application outcomes were assessed: (1) whether or not a GRF/ECS application was funded and (2) its award amount. Information on GRF/ECS successful applications and award amounts is publicly available on the UGC website (University Grants Committee, 2020b). Access to information on the number of submissions by gender and funding scheme (GRF vs. ECS) was granted by the Dean of FOSS at HKU.

Indicators. We examined four indicators: number of eligible staff, submission rate, success rate, and average award amount (in HKD ‘000; USD 1 = HKD 7.8; GBP 1 = HKD 9.8, approximately).

Statistical analysis. We first examined the descriptive statistics of overall and gender-specific annual changes in GRF/ECS awards from 2015/2016 to 2020/2021. Second, a decomposition analysis was conducted, focusing on how gender contributed to (1) number of awards and (2) award amounts. We created a three-factor (number of eligible staff, submission rate, and success rate) decomposition formula for the change in the number of awards (Appendix 1 – [i]) and a four-factor decomposition formula (number of eligible staff, submission rate, success rate, and average award amount) for the change in the total award amount for the entire FOSS (Appendix 1– [ii]). The summation of the components will add to 100%. Both decomposition analyses were stratified by gender.

The decomposition effects quantify how much of the annual changes in the number and total amount of awards in FOSS was attributable to the number of eligible staff, the submission rate, the success rate, the average amount per award, and by gender. The three effects and the four effects were used to explain, respectively, the change in the number and total amount of GRF/ECS awards. The decomposition method allows us to empirically examine the impact of the number of eligible staff, the number of submissions, and the number of successful applications on the change of the grant awards. The method is useful in delineating the effects by gender in previous studies (e.g., Madden, 2010; Hosseinpoor et al., 2012; Kwok et al., 2017; Yip et al., 2017). The proposed decomposition is not unique, and other factors can be used. Nevertheless, the number of eligible applicants, submission

rate, and the success rate are the significant factors of interest here to account for gender parity in research grant application performance.

Results

Descriptive statistics. Table 1 presents the changes of GRF/ECS in 2015/2016 to 2020/2021. Over this study period, the gender composition of eligible applicants for GRF/ECS grants in FOSS was about 57.4% men and 42.6% women, which dovetailed the academic staff gender composition of 57% and 43% in 2018 (i.e., mid-way of the study period). By way of comparison, Duke University in the US, with similar QS ranking as HKU, reported having 62% men and 38% women among its academic staff in Social Sciences in 2018 (Duke University, 2020).

The overall submission rate and success rates were 58.2% and 30.9% for FOSS at HKU during the study period, respectively. The overall submission rate was higher for women (59.2%) than men (57.4%), and the overall success rate was also higher for women (33.1%) than men (29.3%). The average amount per award is about the same, HK\$692K and HK\$655K, respectively. Numerically, women have done better than men for these three important indicators.

For some of the changes during the study period, the submission rate reduction offset the impact of success rate improvement on the number of awards and the total amount awarded. For example, the submission rates among women dropped from 65.9% to 50.0% for the period 2015/16 to 2017/18, followed by a gradual increase to 75.6% at 2020/21, whereas the trend of submission rates among men rose steadily between 2016/17 and 2019/20 (49.2–67.7%) and then dropped to 59.7% in 2020/2021. Across our entire study period, women had higher success rates from 2015/16 to 2018/19, whereas men received larger amounts per award only in 2016/2017. When breaking down into GRF and ECS, women had a substantially higher success rate than men in the ECS (50.0% vs. 29.2%, respectively). For the GRF, women, and men had similar success rates (29.5% vs. 29.3%).

Decomposition analysis. Using decomposition analysis, we examined the key components to account for the change in number of awards and the total amount of awards, namely: the number of eligible staff, the submission rate, the success rate, and the amount per award. More importantly, we took into account the gender effects to empirically address the four gender myths about research funding performance described earlier.

Changes in the number of awards. Table 2 presents the contribution of the various factors (%) on the annual change of the number of awards between consecutive years over the academic years of our study period. For example, there was an increase of five awards between 2015/2016 and 2016/2017. These additional five awards can be attributed to improving the success rate of 137.2% (80.0% and 57.2% for men and women, respectively). However, the reduction in the submission rate for men and women contributed to a total decline (–52.7%) on the number of awards (–7.3% and –45.4% for men and women, respectively).

From 2016/2017 to 2017/2018, while there was a decrease in the success rate (36.5–33.3%), the negative effect was offset by an improvement of the submission rate (49.5–50.9%). Men performed worse than women on the success rate, 29.0%, and 39.1%, respectively, on this occasion. Similarly, from 2018/2019 to 2019/2020, the reduction in success rate (29.5–27.5%) was compensated by an increase in submission rate (59.2–65.1%). The decomposition analysis suggested –135.1% and 184.3%, respectively, for the negative impact of the reduced success rate and the positive impact of improved submission rate.

For the latest round of annual change (from 2019/2020 to 2020/2021) with five more awards, the success rate was the most important factor (107.8%). Although the submission rate reduction of men contributed to –28.6% of the number of awards, the increase in success rate (88.6%) for men was more than compensated for it, with a net contribution of 60% from men. The reduction in the number of eligible female applicants contributed to –9.5% of the total effect. The contribution of the improvement of success and submission rate for women was 30.3% and 19.3%, respectively, with a net contribution of 40% from women.

Changes in the amount of awards. The total funding received for men and women was HKD 36.7 million and HKD 34.4 million, respectively, and the average amount per award was HKD 612K and HKD 662K, respectively (see Table 1). For the total amount of award, Table 3 suggests that the success rate, submission rate, and amount per award all contributed significantly to the increases in the total amount. For example, for from 2015/2016 to 2016/2017, the success rate contributed to 291.7% (133.0% and 158.7% for men and women) of the total increase of funding amount, whereas the reduction in the number of submissions contributed to –138% (–12.1% and –125.9% for men and women, respectively) of the total funding amount (i.e., reduction of HKD 1,233,500). Also, from 2019/2020 to 2020/2021, the increase of the total award amount by HKD 6,510,200 could be attributed to the success rate increase of men and women (HKD 2,678,800 [41.1%] and HKD 704,300 [10.8%], respectively). The submission rate increase of women further contributed to an increase of HKD 243,400 (3.7%) but somewhat offset by the submission rate reduction of men (–864,100 [–13.3%]). The reduction of the number of eligible female applicants contributed to HKD –349,100 (–5.4%) of the total funding amount. The success rate and the amount per award contributed to 52% and 49.7% for the increase in total funding amount. By contrast, the submission rate seems less important in determining the total funding amount (3.7% only).

Discussion

Our study provides new empirical evidence for gender differences in research grants in social sciences in a leading university in Asia, namely, the University of Hong Kong (HKU). Women academics in social sciences there seem to do better in grant submission, success rate, and the average amount per award. When examining GRF and ECS separately, early-career academic women submitted more ECS proposals than men with a higher success rate, contributing to their receiving more research grants. These results go against the myth that hiring female academics would drag down research performance. Quite the opposite, we found that women performed as well, if not better, in securing research grants in social sciences. To improve gender parity, HKU recruited more talented women academics in social sciences in the last five years and also witnessed again in extramural competitive research funding.

Consistent with a prior UK study (Boyle et al., 2015), our findings indicated early-career women academics were more successful than their male counterparts. With increasing female representation in social sciences at HKU hiring in the past five years (from 20% to 40%), the field has benefited from greater gender parity and, as a result, perhaps, awareness of conscious/unconscious gender bias. Also, female social scientists have performed well as productive and visible scholars; their strong track records in research can enhance subsequent grant success. Third, via research and practices to highlight issues such as feminism, gender, sexuality, discrimination, and injustice, social scientists

Table 1 Research Grants Council (RGC) awards to the Faculty of Social Sciences (FOSS) at the University of Hong Kong (HKU) from the academic years 2015/2016–2020/2021.

Year	Number of submissions			Submission rate (%)			Number of grants awarded			Success rate (%)			Total amount ('000, HKD)			Average amount per award ('000, HKD)			Eligible staff		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
ECS	8	5	3	8.1	9.1	6.8	2	1	1	25.0	20.0	33.3	6.70	271	400	335	271	400	335	271	400
2015/16	12	8	4	11.4	13.6	8.7	5	2	3	41.7	25.0	75.0	2020	686	1335	404	343	445	404	343	445
2016/17	17	11	6	16.0	18.3	13.0	8	3	5	47.1	27.3	83.3	4813	1743	3070	602	581	614	602	581	614
2017/18	13	9	4	12.6	15.3	9.1	4	3	1	30.8	33.3	25.0	1604	1078	526	401	359	526	401	359	526
2018/19	12	7	5	11.3	11.3	11.4	5	2	3	41.7	28.6	60.0	3022	667	2355	604	333	785	604	333	785
2019/20	14	8	6	13.6	12.9	14.6	4	3	1	28.6	37.5	16.7	2595	2126	469	649	709	469	709	469	582
2020/21	76	48	28	12.2	13.4	10.6	28	14	14	36.8	29.2	50.0	14,724	6570	8154	526	469	582	526	469	582
Total	50	24	26	50.5	43.6	59.1	12	4	8	24.0	16.7	30.8	7536	1779	5756	628	445	720	628	445	720
GRF	40	21	19	38.1	35.6	41.3	14	7	7	35.0	33.3	36.8	7419	3913	3506	530	559	501	530	559	501
2015/16	37	20	17	34.9	33.3	37.0	10	6	4	27.0	30.0	23.5	6992	3931	3060	699	655	765	699	655	765
2016/17	48	28	20	46.6	47.5	45.5	14	7	7	29.2	25.0	35.0	8836	4599	4237	631	657	605	631	657	605
2017/18	57	35	22	53.8	56.5	50.0	14	10	4	24.6	28.6	18.2	9357	6592	2765	668	659	691	668	659	691
2018/19	54	29	25	52.4	46.8	61.0	20	12	8	37.0	41.4	32.0	16,294	9325	6969	815	777	871	815	777	871
2019/20	286	157	129	46.0	44.0	48.7	84	46	38	29.4	29.3	29.5	56,433	30,140	26,293	672	655	692	672	655	692
Total	58	29	29	58.6	52.7	65.9	14	5	9	24.1	17.2	31.0	8206	2050	6156	586	410	684	586	410	684
2015/16	52	29	23	49.5	49.2	50.0	19	9	10	36.5	31.0	43.5	9439	4599	4840	497	511	484	497	511	484
2016/17	54	31	23	50.9	51.7	50.0	18	9	9	33.3	29.0	39.1	11,805	5675	6130	656	631	681	656	631	681
2017/18	61	37	24	59.2	62.7	54.5	18	10	8	29.5	27.0	33.3	10,440	5677	4763	580	568	595	580	568	595
2018/19	69	42	27	65.1	67.7	61.4	19	12	7	27.5	28.6	25.9	12,378	7259	5120	651	605	731	651	605	731
2019/20	68	37	31	66.0	59.7	75.6	24	15	9	35.3	40.5	29.0	18,889	11,451	7438	787	763	826	787	763	826
2020/21	362	205	157	58.2	57.4	59.2	112	60	52	30.9	29.3	33.1	71,157	36,711	34,447	635	612	662	635	612	662
Total	362	205	157	58.2	57.4	59.2	112	60	52	30.9	29.3	33.1	71,157	36,711	34,447	635	612	662	635	612	662

GRF: General Research Fund; ECS: Early Career Scheme.

Table 2 Decomposition analysis for annual changes in the number of awards.

Year	Success rate	Submission rate	Number of staff	Total
15/16–16/17				
Male	4.0	−0.4	0.4	4.0
Male (%)	80.0	−7.3	7.3	80.0
Female	2.9	−2.3	0.4	1.0
Female (%)	57.2	−45.4	8.2	20.0
Total	6.9	−2.6	0.8	5.0
Total (%)	137.2	−52.7	15.5	100.0
16/17–17/18				
Male	−0.6	0.5	0.2	0.0
Male (%)	62.1	−46.8	−15.3	0.0
Female	−1.0	0.0	0.0	−1.0
Female (%)	100.0	0.0	0.0	100.0
Total	−1.6	0.5	0.2	−1.0
Total (%)	162.1	−46.8	−15.3	100.0
17/18–18/19				
Male	−0.7	1.9	−0.2	1.0
Male (%)	NA	NA	NA	NA
Female	−1.4	0.8	−0.4	−1.0
Female (%)	NA	NA	NA	NA
Total	−2.1	2.7	−0.5	0.0
Total (%)	NA	NA	NA	NA
18/19–19/20				
Male	0.6	0.8	0.5	2.0
Male (%)	64.9	84.3	50.8	200.0
Female	−2.0	1.0	0.0	−1.0
Female (%)	−200.0	100.0	0.0	−100.0
Total	−1.4	1.8	0.5	1.0
Total (%)	−135.1	184.3	50.8	100.0
19/20–20/21				
Male	4.4	−1.4	0.0	3.0
Male (%)	88.6	−28.6	0.0	60.0
Female	1.0	1.5	−0.5	2.0
Female (%)	19.3	30.3	−9.5	40.0
Total	5.4	0.1	−0.5	5.0
Total (%)	107.8	1.7	−9.5	100.0

2017/2018 to 2018/2019 had no change in number of awards granted (both with 18 awards), so the % of contribution derived from decomposition analysis does not apply.
NA not applicable.

are likely to disrupt traditional hierarchy (Mauthner and Edwards, 2010; Ho et al., 2018). Jointly, these factors may have counteracted a longstanding male-dominated culture in universities, funding organizations, and society at large (Munar, 2017), thereby promoting a more gender-equal evaluation of grant applications in social sciences. At HKU specifically, the HeforShe solidarity movement led by the former President and Vice-Chancellor Professor Peter Mathieson and the senior management team since 2015 has helped raise gender equity awareness and implemented gender-parity and family-friendly measures on campus and beyond (HKU, 2020b). Special professional development workshops on career development, as well as year-long mentoring programs, have also been offered to women academics (HKU, 2017) by the Office of one of the authors (Terry Au) in her capacity as the Vice-President of Academic Staffing and Resources. Such initiatives may have helped empowered women academics to do well in research, including the increase in grant applications and successful awards.

Against the backdrop of universities in Asia and beyond, what we found in HKU can, in part, be explained by the international culture, recruitment policy, work practice, government policy, and family support in Hong Kong. Culturally speaking, Hong Kong has been known as a place where ‘East meets West’ (Schnurr and Mak, 2011; Aiston et al., 2020) due to its unique historical background. While preserving traditional Chinese values and practices in society, Hong Kong has evolved to become an international city with a diverse community. The identity, privileges, and power of women have changed amidst complex interactions of globalization, postcolonialism, and Chinese

patriarchy (Lee, 2011). Hence, privileges of male dominance in the families and the work environments may have been less pronounced in Hong Kong than in other parts of Asia (Postiglione and Tang, 2008; Kang and Schnurr, 2010).

At HKU, the recruitment of academic talents is open to the world without restriction in citizenship or nationality—and indeed with a preference for non-HKU graduates to reduce nepotism—and not biased by gender or any other demographics (HKU, 2020a). In fact, as reported in our study, new faculty appointments in social sciences in the past five years were made to more women than men, and most of them were not local candidates. Most early-career female assistant professors have a strong record of obtaining grants, especially those with overseas training and international collaborations. As a matter of fact, the male-to-female ratio of chair professors and endowed professors in FOSS from 2015 to 2020 is 9:11.

Institutional support and female-friendly workplaces have been found to significantly increase the success rates of grant applications among female academics (Teodorescu, 2000; Jung, 2012). At HKU, the institution provides research support for early career academics without any gender consideration. There has also been advocacy and engagement of gender equity around the campus (e.g., the HeForShe Initiative), with a recent President & Vice-Chancellor being a strong advocate (HKU, 2017, 2020b). The HeForShe Movement has raised awareness of gender equality in the participatory institutions, including HKU (UN Women, 2016). In addition, HKU’s Equal Opportunity Unit set up a Working Group on Race, Gender Identity, Sexual Orientation, and Family Status in 2014 to examine HKU’s equality policies. Since 2016, the Vice-President of Academic Staffing and Resources has led efforts to enhance gender equity, women’s access to leadership opportunities, and family-friendly policies in HKU. The Equal Opportunity Unit assists in creating and safeguarding an inclusive environment on campus.

At the government policy level in Hong Kong, the Labor Department in 2020 has successfully spearheaded an extension of maternity leave from 10 weeks to 14 weeks with 80% of wage coverage. Notably, in such salary coverage at HKU is 100% during the 14 weeks of maternity leave. There are also accompanied family-friendly measures to offer other support (e.g., teaching reduction for the birth of a child or adoption of a young child; additional leave days for taking care of family members with medical needs). These policies further reduced the burden of raising young children and caring for elderly parents among women academics—in line with the government urging employers to adopt family-friendly measures (Siu et al., 2006).

The common practice of employing live-in foreign domestic helpers in Hong Kong means that women academics (and professionals in general) have considerable help for house chores and childcare. This societal culture has rendered family responsibilities less gendered on the division of household labor between women professionals and their partners/spouses. Indeed, contrary to the findings in the West (Watson and Hjorth, 2015; McAllister et al., 2016), Aiston (2014) found that motherhood did not have a negative impact on woman academics’ research productivity in Hong Kong, as measured by the number of books and journal articles published. Together, these factors have yielded a more gender-equitable culture at HKU and in Hong Kong. They may also have contributed our findings that the success of grant applications seemed to depend significantly on applicants’ time and efforts, regardless of gender—in line with previous studies (Teodorescu, 2000; Jung, 2012).

Our results suggest promising next steps for universities, research institutes, funding agencies, and the society at large to narrow the gender gap across disciplines. Within departments, faculties, and universities, although female Principal Investigators

Table 3 Decomposition analysis for changes in the amount of awards ('000, HKD).

Year	Success rate	Submission rate	Number of staff	Amount per award	Total
15/16-16/17					
Male ('000, HKD)	1640.1	-149.1	149.1	908.7	2548.9
Male (%)	133.0	-12.1	12.1	73.7	206.6
Female ('000, HKD)	1957.6	-1553.4	279.8	-1999.3	-1315.4
Female (%)	158.7	-125.9	22.7	-162.1	-106.6
Total ('000, HKD)	3597.7	-1702.5	428.9	-1090.6	1233.5
Total (%)	291.7	-138.0	34.8	-88.4	100.0
16/17-17/18					
Male ('000, HKD)	-317.2	239.2	77.9	1075.9	1075.9
Male (%)	-13.4	10.1	3.3	45.5	45.5
Female ('000, HKD)	-484.0	0.0	0.0	1773.5	1289.5
Female (%)	-20.5	0.0	0.0	75.0	54.5
Total ('000, HKD)	-801.2	239.2	77.9	2849.4	2365.3
Total (%)	-33.9	10.1	3.3	120.5	100.0
17/18-18/19					
Male ('000, HKD)	-467.8	1193.0	-94.6	-628.3	2.3
Male (%)	34.3	-87.4	6.9	46.0	-0.2
Female ('000, HKD)	-947.6	533.0	-266.5	-685.6	-1366.7
Female (%)	69.5	-39.1	19.5	50.2	100.2
Total ('000, HKD)	-1415.4	1726.0	-361.1	-1313.9	-1364.4
Total (%)	103.7	-126.5	26.5	96.3	100.0
18/19-19/20					
Male ('000, HKD)	368.2	478.5	288.7	446.0	1581.4
Male (%)	19.0	24.7	14.9	23.0	81.6
Female ('000, HKD)	-1190.8	595.4	0.0	952.1	356.7
Female (%)	-61.4	30.7	0.0	49.1	18.4
Total ('000, HKD)	-822.5	1073.9	288.7	1398.0	1938.1
Total (%)	-42.4	55.4	14.9	72.1	100.0
19/20-20/21					
Male ('000, HKD)	2678.8	-864.1	0.0	2377.5	4192.1
Male (%)	41.1	-13.3	0.0	36.5	64.4
Female ('000, HKD)	704.3	1107.6	-349.1	855.3	2318.1
Female (%)	10.8	17.0	-5.4	13.1	35.6
Total ('000, HKD)	3383.1	243.4	-349.1	3232.8	6510.2
Total (%)	52.0	3.7	-5.4	49.7	100.0

(PIs) were shown to perform better than male PIs in early career, proactive strategies should be promoted to plug the holes in the 'leaky pipeline' (Ma et al., 2018; Gewin, 2019; Grogan, 2019; Weigel et al., 2020). For example, continuous support for female academics through mentorship programs and early career development may reduce productivity disparities and encourage their continuous grant seeking in the mid-career and senior-career stages (Mejia, 2010; Holliday et al., 2014). Bold restructuring of leadership positions and opportunities for advanced career development, including offering more flexible tenure and promotion pathways for women (Mejia, 2010; Zakaib, 2011), or extending the age criteria for women to apply for senior scientific career awards (Ma et al., 2018) have been suggested to retain female researchers beyond their early stage of the academic career. Universities should also consider involving male staffs in the promotion of gender equity, such as providing gender capacity-development training to increase awareness, identify challenges, and find solutions to empower female colleagues in workplaces. For example, the Women in Science at Columbia supports, advances, and reaches out to women in STEM at Columbia University by organizing symposiums and workshops of gender bias and peer-support (Women in Science at Columbia, 2020). At HKU, a year-long mentoring and career coaching program has been offered to 10 female associate professors each year—each nominated by their Deans since 2017 (<http://vpar.hku.hk/hku-10-mentorship-program.html>). Continuous efforts to create integrated support for working women are needed, including more informed decision-making tools for family and

career, more family-friendly meeting times and child care support, allowing part-time working plan, remote working, and paid parental leave for both fathers and mothers (Mejia, 2010; Zakaib, 2011; Boyle et al., 2015; Vassie et al., 2020).

For funding agencies, strategies to shape the representativeness of women in research funders, universities, departments, and other committees responsible for public spending can be impactful. For example, the Athena SWAN initiative requires HEIs to obtain an Athena SWAN silver awards as a pre-requisite for certain large-scale funding from the National Institute for Health Research in the UK (Advance HE, 2019; Equality Challenge Unit, 2019b). The initiative was found to encourage gender equity and to be associated with increased rates of female leaders in managerial and professoriate positions (Ovseiko et al., 2016; Xiao et al., 2020). In China, recent studies found raising the maximum age for applying for the Young Scientist Fund by the National Natural Science Foundation of China (NSFC) has increased the representation of female applicants from 37% to 48% since 2011, and female awardees also increased from 33% to 43% (Ma et al., 2018).

Both universities and funding agencies would do well to implement routine data collection and publication related to the staff demographics, funding applications, success rates, award sizes by gender and disciplines. Such transparent evidence would not only help prospective applicants to assess the institutional culture but also facilitate policy design targeting specific disciplines and sectors. Upon funding awarded, celebrating women's achievement publicly and across platforms can enhance the

recognition and visibility of excellent female researchers (Boyle et al., 2015).

Lastly, social campaigns, such as the Time to Change (TTC) program launched in 2009 in the UK, have been found to reduce stigma, discriminatory behaviors while improving public attitudes toward people with mental illness (Henderson and Thornicroft, 2009; Xiao et al., 2020). Hence, gender-equity national and regional campaigns could also bring together funding agencies, a consortium of prominent universities, and societies to develop coordinated approaches to reducing gender inequalities across social sciences and STEM disciplines in science.

Strengths and limitations

This study has three major strengths. First, we used decomposition analysis to identify the relative effects of academic staff demographics, submission rates, and success rates for overall changes in research grant funding. Second, we examined ECS and GRF together and separately, which revealed gender differences for early-career academics favoring women (i.e., ECS). Third, our data span successive annual changes in research funding from 2015/2016 to 2020/2021 were awarded by a major funding agency (RGC of Hong Kong) for a major research-oriented university. Therefore, our study makes an important contribution to understanding female academics' position and status regarding grant success, going beyond the Western context to identify commonality and differences.

We are mindful of the following limitations of this study. First, we did not collect data on or control for age, domain or research, and specific academic positions (e.g., Assistant Professor, Associate Professor, Professors), which can affect gender bias in grant funding (Witteman et al., 2019a). Second, we focused on one institution, not all the UGC-funded universities in Hong Kong. There might be heterogeneity across universities in terms of research grant funding. Third, this study contributes to the literature about the gender (dis)parity of research grant success in social sciences. It should be noticed that the sub-fields and research domains in social sciences could be more diverse than the disciplines included here. Lastly, we did not examine research-support activities or other initiatives within the University that may affect extramural research funding results.

Conclusion

The empirical results revealed that women made a solid contribution to compete successfully for grants in social sciences. The performance of the newly recruited early-career woman colleagues is very promising. For the number of awards, it is important to improve the submission rate, since the success rate did not seem to be negatively affected (or diluted) by a higher submission rate. Importantly, more successful awards can build grant-writing capacity not only for the successful applicants but also via experience sharing for their colleagues. Raising the submission rate (by applying more frequently and mobilizing and supporting more colleagues to apply) and success rate simultaneously attests to this. For award amounts, all three factors—submission rate, success rate, and individual grant amounts—are significant in determining the total amount of awards received by the institution. It is pleasing to see no evidence of gender bias against women in social science regarding grant fundings success in Hong Kong, and this can and should happen in other places.

Data availability

The datasets generated during and/or analyzed during the current study are not publicly available due to data privacy issue from the faculty as it concern the individual performance. They are available from the corresponding author on reasonable request.

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Competing interests

The authors declare no competing interests.

Additional information

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