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Three decades of tourism scholarship: Gender, collaboration and research methods

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ABSTRACT

Despite ongoing problems with gender inequalities in tourism, little is known about gender differences in first and solo authorships, collaboration, and choice of research approaches. This study analyzes these academic practices using 4973 articles (11,033 authors) in three major tourism journals from 1990 to 2017. The results show evidence of gender homophilic collaboration behaviors. Gender heterogeneous co-authorships are becoming pervasive and seem to be driven by female first authors. Solo female researchers strongly associate with qualitative research. While male-only teams have the lowest likelihood of using qualitative research, the situation is more complex for gender heterogeneous teams. Practical suggestions derived from the findings for the gender equality agenda in tourism are discussed to promote more gender-diverse collaborations and female-led research.

1. Introduction

Substantial and pervasive gender differences in academia have led to a diversity and inclusion agenda for higher education that attempts to redress ongoing inequalities (Nygaard & Bahgat, 2018; Pritchard & Morgan, 2017). As part of this, tourism has started identifying and challenging its own gender inequalities. Implicit in previous bibliometric studies on research productivity (e.g. Li & Xu, 2015; Pritchard & Morgan, 2017; Roberts, 1998), tourism research is not immune to gender differences (Basurto-Barcia & Ricaurte-Quijano, 2017; Pritchard & Morgan, 2017). Research practices in tourism are inherently masculinized, posing challenges for the gender equality agenda (Munar et al., 2015; Nunkoo, Hall, Rughoobur-Seetah, & Teeroovegadum, 2019; Pritchard & Morgan, 2017). This has led to gender differences in research output and academic leadership. There have been few discussions of the gendered nature of first and solo authorships, collaboration, and research methods, however. These are key aspects of the research process and information about them is needed to understand the nature of gender differences within tourism research.

Although the methodological choice for a study should be driven by epistemological considerations, the nature of the research problem, and the study objectives (Creswell, 2007) rather than researcher gender, academics may choose methods to master and then select research problems appropriate for that method. This element of choice opens the door for gender influences. Perhaps because of such choices, female researchers and articles first-authored by females are more likely to employ qualitative than quantitative approaches in many fields (Ashmos Plowman & Smith, 2011; Oakley, 1998, 2000; Williams, Kolek, Saunders, Remaly, & Wells, 2018). For tourism, in *Annals of Tourism Research* (ATR) from 1990 to 2015, the proportion of qualitative articles increased in line with the proportion of female researchers per year (Nunkoo, Hall, & Ladsawut, 2017), but it is not known whether this was due to gender differences in research method choice. A frequent, but largely untested, assertion in tourism is that there is an association between gender and research methods, an argument that emanates from the historically gendered nature of the quantitative-qualitative divide (Oakley, 2000). This provides an impetus for studying authorship gender in combination with research methods.

From a critical perspective, it is important to assess the role of social categories such as gender for knowledge production and to examine the implications of academic tourism being associated with masculinized practices. If research approaches in tourism are gendered with female-associated methods employing a minority paradigm and if collaboration among tourism researchers has a gender dimension that also

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influences research method choices (Abramo, D'Angelo, & Murgia, 2013; Williams et al., 2018), then these pose a challenge for the gender equality agenda. Questioning academic practices that goes beyond productivity metrics is important to facilitate a transformation towards more gender- and method-inclusive scholarship in tourism. In response, this paper investigates author gender, collaboration, and research methods using 4973 full-length articles published between 1990 and 2017 in *ATR*, *Tourism Management (TM)*, and *Journal of Travel Research (JTR)*. The study answers the following research questions for tourism research since 1990, including trends over time: (1) what is the balance between solo authorship and collaborative research? (2) is there a gender disparity in solo authorship? (3) do male and female tourism researchers differ in their collaboration patterns? and (4) do male and female tourism researchers differ in their research method choices?

The paper fills two gaps in the literature. First, it generates new evidence of gendered academic practices in tourism research by investigating the gender differences in first and solo authorship and collaboration in tourism. Females in several disciplines are less likely to be the first author (West, Jacquet, King, Correll, & Bergstrom, 2013) and have different collaboration patterns than males (Abramo et al., 2013). If the same is true for tourism, then female contributions to the tourism research agenda and any gender differences in collaboration patters might not be adequately recognized. However, these issues are unclear in tourism because existing bibliometric studies on authorship and collaboration are gender insensitive (e.g. Benckendorff & Zehrer, 2013; Köseoglu, King, & Yildiz, 2019; McKercher & Tung, 2015; Racherla & Hu, 2010).

This article also investigates the relationship between author gender (s) and research methods. There have been some discussions on the gendered nature of research paradigms in tourism. However, debates are limited to the quantitative-qualitative divide, with an emphasis on feminist research approaches that increase female representation in tourism (Chambers, Munar, Khoo-Lattimore, & Biran, 2017; Chambers & Rakić, 2018; Munar, Khoo-Lattimore, Chambers, & Biran, 2017), but not on how a researcher's gender may influence their approach to tourism scholarship. Chambers et al. (2017) recognize the limitations of extant gender-based research in tourism, arguing that "our focus on tourism academia recognizes … the crucial role that tourism academics play in knowledge production. We therefore urge for a shift in the focus of the extant gender research in tourism away from tourism as a phenomenon to ourselves as tourism academics" (p. 501). Munar et al. (2017) also call upon researchers to examine the gendered nature of scholarly practices. This research contributes theoretically to the literature on the social epistemology of tourism research. It provides evidence of gender as a constituent of academic practices relating to authorship, collaboration, and research methods use that in turn shape knowledge production, but which have thus far remained unexplored in tourism.

2. Authorship, gender and tourism research

2.1. Gender, productivity and academic leadership

Despite several years of gender equality interventions in academia, many initiatives have met with little success (Lörz & Mühleck, 2019). Females lag in academic productivity and leadership positions in several fields (Mauleón, Hillán, Moreno, Gómez, & Bordons, 2013; Munar et al., 2015), although it is impossible to fairly assess gender differences in productivity given that females are more likely to take career breaks and periods of part-time working for caring responsibilities. In tourism and hospitality in the 1990s, less than 24% of articles published in academic journals were authored by females (Roberts, 1998). Zhao and Ritchie's (2007) investigation of academic leadership in tourism research from 1985 to 2004 also found a severe under-representation of female authors. Only six female researchers (10.5%) figured in their list of 57 leading tourism scholars. A bibliometric study by Zopiatis, Theocharous, and Constanti (2015) revealed that no females appeared in the list of 44 prolific hospitality and tourism scholars identified by the researchers in era one (before 1990), while this figure increased to only three in era two (after 1990). Although the share of female authorship for three major tourism journals increased steadily from 12% in 1970 to 42% in 2017 (Kirilenko & Stepchenkova, 2018), female representation has not improved in any recent bibliometric lists of the most productive researchers in tourism and hospitality (Pritchard & Morgan, 2017).

For example, a recent study by Mulet-Forteza, Genovart-Balaguer, Mauleon-Mendez, and Merigó (2019) found severe underrepresentation of women in the list of the 50 most productive authors in tourism, leisure, and hospitality journals. Likewise, Pritchard and Morgan's (2017) study on gender and academic performance showed that females constituted only 14% of the 50 most cited scholars and 12% of those with the highest h-index (which is also affected by career gaps). Females are also underrepresented as keynote speakers, editorial board members, and honorary committee members (Munar et al., 2015; Pritchard & Morgan, 2017; Walters, 2018), and in portraits of pioneers in tourism research and education (Ek & Larson, 2017). These lists are all inherently gender biased because males form a higher proportion of older tourism scholars as well as being less likely to take career gaps or periods of part time work to align with caring responsibilities. Thus, males are likely to be heavily overrepresented amongst current scholars with the longest effective career length.

2.2. Gender, solo authorship and collaboration

Academic leadership is not only measured by productivity, but also by the number of solo articles a researcher has published and by authorship order in case of joint publications (Fox, Ritchey, & Paine, 2018). An author is someone who has made "an independent material contribution to the manuscript" (Coats, 2009, p. 150). Whilst the first and last authors usually make substantial contributions, other authors may complete a relatively disconnected task (Sundling, 2017). Non-trivial and non-routine contributions are normally rewarded with a co-authorship (Katz & Martin, 1997). It is common for academic research to be conducted by teams to combine different types of knowledge, methods expertise, or to share the work. It can be more efficient than solo authorship if contributing researchers specialize in different aspects of a research process, although this is less common in the social sciences (Larivière et al., 2016).

One empirical study (of sociology and linguistics in the USA in 2004) found that males were more likely to specialize in the sense that their oeuvres tended to have a narrower range of keywords (Leahey, 2006). Specialization contains a hidden productivity bonus because contributing to a new topic, area or method entails a time penalty from the need to learn new methods or ideas. Males' diverse and professional networks provide them access to individuals with common research interests, reinforcing expertise and specialization, while females' smaller and homogenous networks mean that they have to collaborate with individuals having research specialties beyond their own, limiting their specialization (Abramo et al., 2013). However, more recent science-wide evidence from Italy suggests that there is not a general trend for a gender difference in specialization, as reflected by the range of fields published in, however (Abramo, D'Angelo, & Di Costa, 2018).

Team research helps multidisciplinary, applied research that seeks to solve real-world problems (Proctor & Vu, 2019). Collaboration is valued by research funders on this basis and sometimes even mandated: for example, standard European Union grants require participation from at least three countries. Increasing the scope of a collaboration (number of institutions, number of countries) also increases the average citation counts of journal articles (Larivière, Gingras, Sugimoto, & Tsou, 2015a, 2015b). Although this suggests that collaboration should aid novelty, empirical evidence suggests the opposite: international collaborations tend to be more conventional (Wagner, Whetsell, & Mukherjee, 2019). Collaborative research and team size in academia overall have increased

steadily over the last century in several disciplines (Abramo & D'Angelo, 2015; Larivière et al., 2015a, 2015b).

Collaboration increased between 1980 and 2013 in all social sciences categories within the Web of Science, including hospitality, leisure, sport and tourism, in terms of the proportion of collaborative papers, the proportion of internationally collaborative papers, and the average number of authors per paper (Henriksen, 2016). An analysis of articles in tourism and hospitality journals over 36 years found a rise of collaborative authorship (McKercher & Tung, 2016). Racherla and Hu (2010) found large networks of co-authorship in tourism, with core groups of researchers central in the networks. Ye, Song, and Li's (2012) analysis indicates a rise in cross-institutional collaboration and multi-authored articles in tourism. Various other bibliometric studies support similar conclusions (Fan, Li, & Law, 2017; Köseoglu et al., 2019). Gender has been ignored in most of these studies, however (Pritchard & Morgan, 2017), although evidence from large scale studies outside tourism suggest that authorship and collaboration patterns are gendered.

Science-wide evidence from Italy suggests that females collaborate intramurally and nationally more than males, but males are more likely to collaborate internationally (Abramo et al., 2013). In six ecology journals (2010–15), male-only collaborations occurred more often than suggested by the overall gender distribution, indicating a degree of male collaboration homophily (Fox et al., 2018). The proportion of female first authors also increased and females were more likely to be the first author than to fulfil any other role. Collaboration increased in five distance education journals (2000–08), with no gender differences in tendency to collaborate (Zawacki-Richter & von Prümmer, 2010). Within organizational psychology, females are more likely to collaborate (Fell & König, 2016). In economics, accounting and finance, younger academics are more likely to publish alone (Kuld & O'Hagan, 2018; Vafeas, 2010), perhaps because they have not yet built their own disciplinary networks. Because of the demographic shift towards females over time, a side effect of this would be that females would collaborate less because they are overrepresented in the younger group. In eleven broad natural science, medical and engineering fields in Italy, female researchers are slightly more likely to collaborate than males in ten broad areas (exception: Civil Engineering), but both are very likely to collaborate (F: 97.9%, M: 96.9%) (Abramo et al., 2013).

2.3. Gender and research methods

Gender not only influences the propensity to collaborate, but also affects the choice of research topic and this in turn influences the choice of research methods (Thelwall, Bailey, Makita, Sud, & Madalli, 2019; Thelwall, Bailey, Tobin, & Bradshaw, 2019). Social epistemology provides the necessary theoretical underpinning for studying the influence of author gender on research methods insofar that it explains how social dimensions such as gender influence knowledge acquisition (Diaz-Kope, Miller-Stevens, & Henley, 2019; Rolin, 2004). Having its root in port-modernism, the central tenet of social epistemology is that truth is a relative concept, where meanings of reality are socially constructed, shaped by the researchers' gender. Accordingly, its proponents argue that males and females may view the world differently, which shapes their ways of knowing and research paradigms (Diaz-Kope et al., 2019; O'Shaughnessy & Krogman, 2012). A social epistemology approach to scientific inquiry challenges the notion that research epistemology and by virtue, research approaches, are gender neutral.

A female association with qualitative methods dates to the early 1970s when academia was criticized by feminists for being too masculinized. It was argued that positivist research cannot be used to advance the cause of women as an oppressed group (Oakley, 1998). For advocates of feminist methods, quantitative approaches ignore the contextual complexity of societal life, support sexist values, and exclude women as research subjects, failing to accurately address research questions about women (Heimtun & Morgan, 2012; Oakley, 1998). Addressing these criticisms, qualitative research in tourism is positioned as best suited to improve female experiences and conditions across all spheres of tourism development (Christou & Janta, 2019; Heimtun & Morgan, 2012). Whilst it seems possible that female tourism researchers are more likely to use qualitative approaches, this has yet to be empirically verified.

There is long-standing evidence of a relationship between author gender and research method choice in other fields. Early studies found females to be more likely to use qualitative methods in sociology (Grant, Ward, & Rong, 1987). Five distance education journals had gender differences in both topic choices (males more interested in technology) and methods, with females being more likely to choose qualitative and mixed methods rather than quantitative methods, whether for solo research, single gender teams or in terms of the first author of mixed gender teams (Zawacki-Richter & von Prümmer, 2010). For three management research journals (1986–2008), females were more likely to employ qualitative rather than quantitative methods, with no differences over time (Ashmos Plowman & Smith, 2011). For *British Journal of Social Work* 1971–2013, females were slightly more likely to use qualitative methods, but their prevalence increased for both genders, to 65% (female) and 61% (male) (Jobling, Shaw, Jang, Czarnecki, & Ramatowski, 2017). For three higher education journals 2006–2010, females were more likely to use qualitative methods and males quantitative. In the field of education, mixed gender teams were more likely to use quantitative research (Williams et al., 2018).

For dissertations 2010–2014 in public administration, policy, and public affairs, females were more likely to choose qualitative methods, but were increasingly likely to use quantitative methods instead (Diaz-Kope et al., 2019). At a science-wide level, an analysis of US research from 2017 in 285 fields with a keyword comparison method found an association between males and quantitative research methods (e.g., measurement, simulation) and between females and qualitative (and exploratory) research methods (e.g., interviews) (Thelwall, Bailey, Tobin, et al., 2019). A similar study for India failed to find a female qualitative association, but replicated the male quantitative association (Thelwall, Bailey, Makita, et al., 2019). Although mostly limited to a few social science fields, the results overall consistently point to a female association with qualitative research and a male association with quantitative research, but with mixed evidence about whether the prevalence of qualitative research has increased.

3. Methodology

3.1. Data sources

This study analyses articles from 1990 to 2017 published in *ATR, JTR, and TM*, the leading journals in the field of tourism. Their different scopes ensure that our dataset covers articles on diverse topics and with diverse methodologies. Only full-length articles were included because these are directly comparable units of knowledge production and because theoretical and methodological underpinnings are more likely to be described in such papers than in research notes, editorials, and commentaries. We retrieved 5346 articles which were analyzed using a content analysis method, a useful approach to study the evolution of knowledge (Sun & Zhai, 2018, pp. 1–28). During the past decades, tourism research has undergone considerable changes in the authorship of journal articles (McKercher & Tung, 2016; Pritchard & Morgan, 2017; Racherla & Hu, 2010) and research methods employed (Molina-Azorín & Font, 2016; Nunkoo, 2018; Nunkoo et al., 2017), so there should be sufficient variety for a meaningful statistical analysis. To capture longitudinal changes in academic practices, we assigned each article to one of the following time periods, depending on its year of publication: first decade (1990–1999); second decade (2000–2009); and third decade (2010–2017).

3.2. Coding process

Following Nunkoo et al. (2017) and Williams et al. (2018), we

classified an article as either 'qualitative', 'quantitative', or 'mixed-methods'. However, we expanded on the three classifications by adding a fourth category of articles that we labeled as 'conceptual', given their popularity in tourism journals and their contributions to knowledge advancement (Xin, Tribe, & Chambers, 2013). 'Qualitative' refers to an article that followed qualitative research designs such as (but not limited to) grounded theory, ethnography, historical analysis, participant observation, phenomenology, action research, case study, focus groups, and document analysis (Creswell, 2003). We classified an article as 'quantitative' if it was based on quantitative methods of data collection (e.g. surveys), and/or quantitative data analysis techniques. An article was categorized as 'mixed-method' if it was based on both qualitative and quantitative approaches. 'Conceptual' included articles with no empirical data, such as those with untested theoretical concepts, hypotheses and/or propositions (Xin et al., 2013). We assessed inter-rater reliability using Cohen's kappa (κ) which measures the consistency among raters based on the number of codings in the coding scheme and adjusts for agreement by chance (Cohen, 1960). Fifty articles were randomly selected and coded independently by a second researcher. The κ coefficient was 0.89, which is considered to be excellent, establishing consistency in the coding process (Bakeman & Gottman, 1997).

Borrowing the approach adopted by earlier studies (e.g. Ashmos Plowman & Smith, 2011; Williams et al., 2018), to determine gender of an author, we followed an iterative process combining multiple sources such as the first name, any available online picture and information on departmental and personal websites, curriculum vitae, article biographies, and information from other researchers (both retired and in service). Articles for which we were not able to determine the gender of all author(s) were excluded. Of the 5346 articles that we analyzed, we were unable to determine the author's/authors' gender for 373 (7%), reducing our sample to 4973 articles.

3.3. Data analysis

For descriptive analyses of the data, we reported frequency distributions for author gender, collaboration patterns, and the use of research methods across the three decades and journals. To statistically assess changes in authorships and collaboration patterns over time, we used classical linear regressions of proportions against publication year, comparing results at equally spaced intervals, which is a standard approach for time series (Shumway & Stoffer, 2017). This tests for a linear trend over time in the proportion with a given property (e.g., proportion female first-authored regressed against publication year). We used a standard chi-square test based on first-author gender to analyze the likelihood of cross-gender and same-gender collaboration. To investigate the association between authorship team gender and research method choice, we utilized a multinomial logistic regression analysis because the outcome variable has more than two unordered, non-overlapping categories (Petrucci, 2009). This technique predicts the probability of category membership on a dependent variable from multiple independent variables. Multinomial logistic regression has been applied in previous studies analyzing the relationship between gender and choice of methodological approaches (Grant, Ward, & Rong, 1987; Diaz-Kope et al., 2019).

4. Results

4.1. Authorship and gender

The 4973 articles analyzed were authored by 11,033 researchers (Table 1). The mean number of authors, male authors, and female authors per article was 2.22, 1.53, and 0.69, respectively. The number of articles published in the three journals increased considerably over the three decades. *TM* published the largest number of articles ($n = 2413$, 5595 authors), followed by *ATR* ($n = 1405$, 2723 authors), and *JTR* ($n = 1155$ articles, 2715 authors). Male authors dominated all three journals: *ATR*: 63.8%; *JTR*: 68.1%; and *TM*: 71.5%. Overall, over two thirds of the authors were male (68.7%). Males also dominated first-authorship with a similar percentage (68.3%). Most articles were authored by only males (51.3%), with an additional 35.4% being the result of cross gender collaboration. *JTR* and *TM* appeared to be the least attractive publication outlets for articles authored by only females, while articles involving cross gender collaboration were quite popular across all three journals.

In terms of changes over time, solo female authors declined from 8.8% in the first decade to 6.1% in the third decade (Fig. 1). There was a greater decrease for solo male authors from 39.3% to 11.6%. The proportion of female first authors rose from 19.2% (8.8 + 3.1+7.3) in the first decade to 42.2% (6.1 + 8.4+27.7) in the third decade. Collaborative research involving female-only teams rose from 3.1% in the first decade to 8.4% in the third decade. Cross-gender collaboration, irrespective of the gender of the first author, rose steadily over time.

To statistically test the hypothesis that there is a linear trend over time in the proportions of articles with different authorship gender properties, classical linear regressions of proportion against publication year (1990–2017) were used, with the following results:

- The null hypothesis of no linear trend in the *proportion of female first-authored articles* by publication year was rejected ($F = 118.78$, $p < 0.001$, 69% of variance explained by time). The time effect was significant ($\beta = 0.83$ $t = 10.90$, $p < 0.001$), so the percentage of female first-authored articles increased by 1.01% each year, on average from 1990 to 2017.
- Using a similar procedure, the null hypothesis of no linear trend in the *proportion of male first-authored articles* was retained ($\beta = 0.04$, t

Table 1
Author and article breakdown by gender.

	ATR		JTR		TM		All journals	
	n	%	n	%	n	%	n	%
Author breakdown by gender								
Male	1736	63.8	1848	68.1	4001	71.5	7585	68.7
Female	987	36.2	867	31.9	1594	28.5	3448	31.3
Total	2723	100	2715	100	5595	100	11,033	100
Author breakdown by first-author gender								
Male	887	63.1	793	68.7	1719	71.2	3339	68.3
Female	518	36.9	362	31.3	694	28.8	1574	31.7
Total	1405	100	1155	100	2413	100	4973	100
Article breakdown by author gender								
Only male authors	663	47.2	558	48.3	1330	55.1	2551	51.3
Only female authors	284	20.2	138	11.9	242	10.0	664	13.4
Cross-gender collaboration	458	32.6	459	39.7	841	34.9	1758	35.4
Total	1405	100	1155	100	2413	100	4973	100

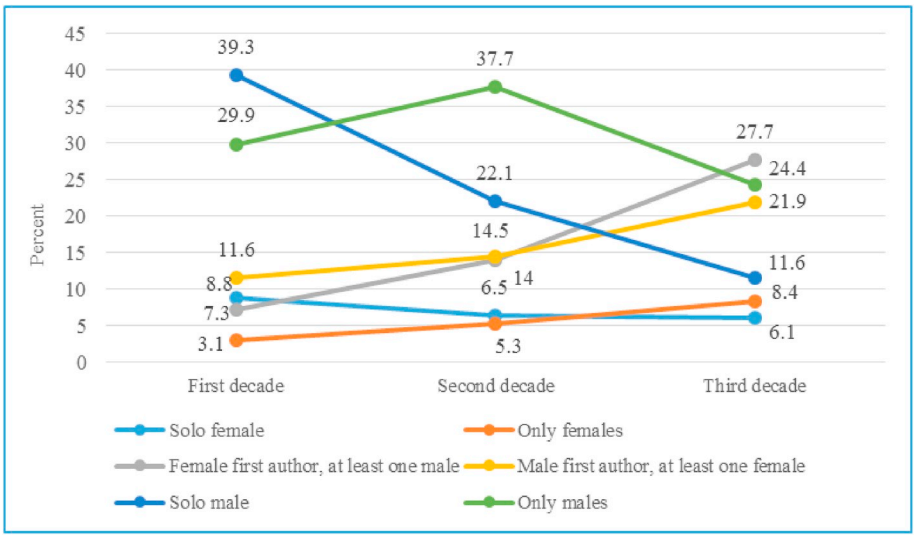

Fig. 1. Evolution in author-gender combinations during the three decades analyzed.

$= 0.32$, $p > 0.05$). Thus, although there is an apparent trend in the data, it may be due to natural fluctuations between years.

- The null hypothesis of no linear trend in the *proportion of female-only articles* by publication year was rejected ($F = 4.92$, $p < 0.05$, 16% of variance explained by time). Time had a relatively weak, although statistically significant, effect in explaining changes in the proportion of articles with only female authors ($\beta = 0.40$, $t = 2.22$, $p < 0.05$), giving evidence that the percentage of female-only articles increased by 0.13% each year, on average from 1990 to 2017.
- The null hypothesis of no linear trend in the *proportion of male-only articles* by publication year was rejected ($F = 192.15$, $p < 0.001$, 88% of variance explained by time). We found a significant, but negative effect of time ($\beta = -0.94$, $t = -13.86$, $p < 0.001$), suggesting that the proportion of articles with only male authors has decreased by about 1.53% per year.
- The null hypothesis of no linear trend in the *proportion of cross-gender articles* by publication year was rejected ($F = 168.40$, $p < 0.001$, 87% of variance explained by time). Time had a significant effect on the proportion of articles involving cross gender collaborations ($\beta = 12.98$, $t = 12.98$, $p < 0.001$), so the proportion of cross-gender collaborations increased by about 1.40% per year.

4.2. Collaboration patterns

We analyzed the likelihood of cross-gender and same-gender collaboration by testing the null hypothesis that the gender composition of the co-author(s) is independent on first author gender. A chi-square difference test provided support for the alternative hypothesis that the gender composition of the co-author(s) is dependent on first author gender ($\chi^2 = 144.867$, $p < 0.001$). We conducted a post-hoc analysis to identify significant differences between each combination of the two variables and included the adjusted residuals (Z-score associated with an alpha level of 0.05) in the 2 by 4 contingency table (Table 2). An adjusted residual value of greater than 1.96 or smaller than −1.96 indicates statistical significance. However, to reduce the type I error likelihood, we converted the Z-scores to probability values (Garcia-Perez & Nunez-Anton, 2003). The probability value for each adjusted residual was then calculated using the chi-squared right tail distribution and the squared of the adjusted residuals with one degree of freedom. The *p*-values obtained indicated statistical significance across all combinations ($p = 0.0063$). Compared to a male first author, a female first author collaborated 1.72 times more with female only co-authors, 1.65 times more with teams involving both males and females, but only 0.85 times as much with male-only co-authors. A male first author was 1.44 times more likely to publish solo compared to a female first author.

Table 2
Chi-square tests of likelihood to collaborate based on first-author gender.

First author		Co-author gender combination			
		Female only	Male only	At least one female & one male	No-co author
Male	Count	392	1489	429	1063
	Expected count	479.9	1416.5	516.8	959.8
	% within first author	11.6	44.1	12.7	31.5
	Adjusted residual	−7.7***	4.5***	−7.5***	7.0***
	Collaboration likelihood	.58	1.18	.61	1.44
Female	Count	310	583	327	341
	Expected count	222.1	655.5	239.2	444.2
	% within first author	19.9	37.3	20.9	21.8
	Adjusted residual	7.7***	−4.5***	7.5***	−7.0***
	Collaboration likelihood	1.72	.85	1.65	0.69

4.3. Research methods

Of all articles submitted to *ATR*, a large minority used qualitative approaches (41.1%) (Table 3). Our results confirmed *JTR*'s quantitative orientation, with more than 70% of articles published in the journal making use of quantitative approaches. Conceptual articles were most population in *ATR* (21.9%) and *TM* (29.5%). Mixed-methods articles

Table 3
Research approaches across journals.

Research approaches	ATR		JTR		TM	
	n	%	n	%	n	%
Qualitative	581	41.4	114	9.9	309	12.8
Quantitative	453	32.2	867	75.1	1264	52.4
Mixed-methods	63	4.5	64	5.5	128	5.3
Conceptual	308	21.9	110	9.5	712	29.5
Total	1405	100	1155	100	2413	100

were uncommon across all three journals. In terms changes in research approaches used over time, the proportion of qualitative studies increased steadily from 14.4% in the first decade to 23.6% in the third decade (Fig. 2). The proportion of articles based on quantitative methods also rose from 38.5% in the first decade to 60.1% in the third decade. While mixed-methods research remained relatively stable but rare, conceptual articles experienced a sharp decline.

4.4. Authorship team gender and research method choice

In terms of the methods employed by the different article authorship combinations (Fig. 3), solo females (40.5%) were most likely to adopt a qualitative approach in their research. Gender heterogeneous teams, irrespective of the gender of the first author, preferred quantitative over other types of research approaches. Conceptual articles are also more likely to be authored by solo females (34.0%) and solo males (42.0%).

To assess the influence of author gender on choice of research method statistically, we used a multinomial logistic regression. The null hypothesis is that there is no relationship between any of the independent variables and research method choice (i.e., all the regression coefficients are 0). We used the following author-gender combination as the predictor variables: female solo author; female-only team; female first author and at least one male co-author; male first author and at least one female co-author; male solo author; and male-only team. The final model was a statistically improved model compared to the null model ($\chi^2 = 630.84_{(15)}$; $p < 0.001$). A lower Akaike's Information Criterion (AIC) for the final model compared to the null model also suggested good fit (Tabachnick, Fidell, & Ullman, 2007). Articles authored by a sole female were 9.39 times and those authored by female-only teams were 2.13 times more likely to use qualitative than quantitative approaches compared to articles written by male-only teams (Table 4). Articles with a female first author and at least one male were 2.14 times more likely to use qualitative over quantitative methods compared to those written by male-only teams. Furthermore, articles with a male first author and at least one female co-author were 1.34 times more likely to use qualitative than quantitative approaches compared to male-only teams. Male sole authors were 3.13 times more likely to use qualitative than quantitative approaches and 3.72 times more likely to write conceptual than quantitative articles compared to male-only teams. Solo female authors were 2.81 times more likely to choose mixed-methods and 4.72 times more likely to write conceptual than quantitative articles compared to male-only teams.

5. Discussion

The social epistemology literature positions gender as a relevant factor in scientific inquiry (Rolin, 2004). In this article, we demonstrate empirically that authorship, collaboration, and choice of methods used by tourism scholars are all gendered academic practices. The first author usually contributes the most to a publication. Studies have systematically found gender differences in first-authorship, with females less likely to hold the first position (Bonham & Stefan, 2017; Fishman, Williams, Goodman, & Ross, 2017). Encouragingly, we find that the representation of females as first-authors in tourism research has increased dramatically as their representation within the field has increased. This is a significant advancement toward greater gender parity in academic tourism because the ability to first author articles is important to secure legitimacy, recognition, credit, and leadership and to acquire funding (Broderick & Casadevall, 2019). Power dynamics between genders can cause problems in determining first-authorship, however, with suggestions that junior females may be exploited or not fully listened to by senior males in some cases (Gaughan & Bozeman, 2016). For example, in an analysis of 2898 scientific papers, Broderick and Casadevall (2019) raise concerns about females not receiving proper credit for publications. Such exploitations may be subtle, disguised, and unspoken in a tourism academy characterized by masculinized homosocial academic practices (Basurto & Ricaurte-Quijano, 2017; Christou & Janta, 2019; Figueroa-Domecq, Pritchard, Segovia-Pérez, Morgan, & Villace-Molinero, 2015; Munar et al., 2015, 2017).

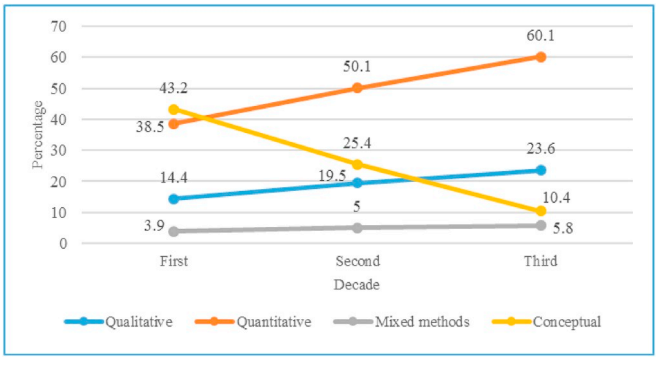

Fig. 2. Evolution in research approaches over three decades analyzed.

Our results point to a remarkable growth in collaborative works, accompanied by the demise of solo authorship, irrespective of gender. Bibliometric studies of tourism (Fan et al., 2017; Henriksen, 2016; Köseoglu et al., 2019; McKercher & Tung, 2016; Racherla & Hu, 2010) and elsewhere (Abramo et al., 2013; Kuld & O'Hagan, 2018) have previously found co-authorship to be the norm among scholars. Greater emphasis on refereed journal articles in appointments and promotion means that researchers may strive to increase their scientific output by co-authoring papers with other colleagues (Kuld & O'Hagan, 2018). Collaborative works may also be a response to the need for interdisciplinarity in tourism research, which is essential to address complex societal, environmental, and economic challenges (Hall et al., 2018), requiring researchers with different sets of skills to work together (Darbellay & Stock, 2012; Okumus, van Niekerk, Koseoglu, & Bilgihan, 2018). Technological progress has facilitated collaboration by allowing studies to draw from a broader set of skills and resources. Therefore, it is not unusual to find recent collaborative tourism research involving economists, geographers, psychologists, sociologists, anthropologists, and statisticians. While evidence of this trend may help to improve the management of tourism, it also indicates the maturation of the tourism field. However, beyond these arguments supporting increased co-authorship, increased collaboration does not always equate to increased productivity per individual author if fractional credit is assigned per paper (McKercher & Tung, 2016). Moreover, collaborative research creates issues for the recognition of efforts that affect careers, particularly for females who may not be duly recognized in the publication bylines, despite sometimes having contributed at least as much as male researchers (Abramo et al., 2013; Barlow et al., 2018).

Our study suggests that both the practice solo authoring articles and engaging in collaborative works are gendered. Solo authorships are more common among males. Contrary to this finding, Boschini and Sjögren (2007) found that in economics, females single authored significantly more than males (albeit over a decade ago). Thus, it seems that the gender profile of solo authors is field dependent, probably because of the gender profile of the base population of researchers the field. We also find that collaboration is increasingly becoming gender heterogeneous. However, there is a remarkable gender difference in an author's propensity to collaborate. Both male and female first authors have a higher likelihood to collaborate with researchers from their respective genders. Unlike male first authors, female first authors display a high likelihood of collaborating with a team that comprises of at least one other female as well as male co-authors. Such differences confirm the long-standing evidence that males and females differ in research collaboration, with the latter being more open to collaboration opportunities in some cases (Abramo, D'Angelo, & Di Costa, 2019, pp. 1–14; Bozeman & Gaughan, 2011; (Fahmy and Young, 2017; Ozel, Kretschmer, & Kretschmer, 2014).

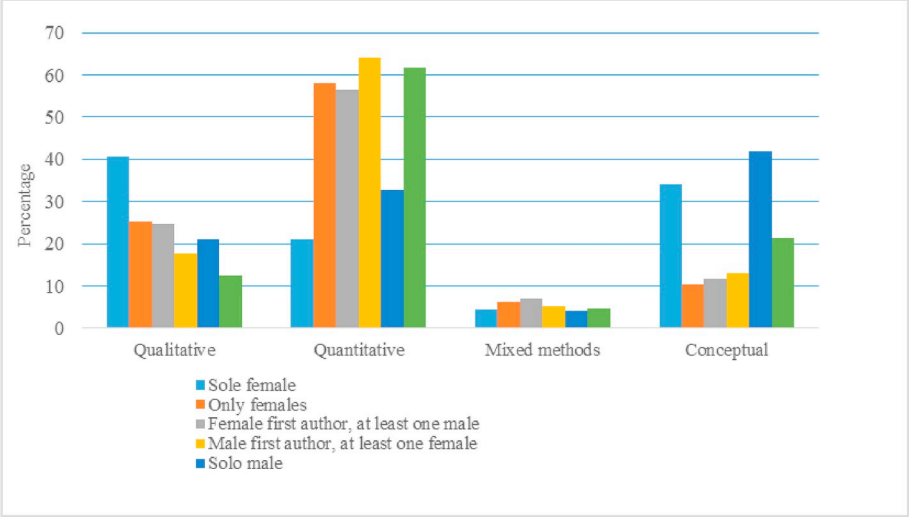

Fig. 3. Research methods choice by author gender combinations.

Table 4
Parameter estimates.

Research methods[a]		B	Std. Error	Wald	Exp(B)	95% Confidence Interval for Exp(B)	
						LB	UB
Qualitative	Intercept	−1.59	.08	392.07***			
	Female solo	2.24	.17	181.88***	9.39	6.78	13.00
	Female-only teams	.76	.16	23.14***	2.13	1.57	2.91
	Female first, at least one male	.76	.11	45.78***	2.14	1.72	2.68
	Male first at least one female	.30	.12	5.83*	1.34	1.06	1.71
	Male solo	1.14	.12	94.37***	3.13	2.49	3.95
	Male-only teams[b]	.00	.	.	.	.	.
Mixed	Intercept	−2.60	.13	428.08***			
	Female solo	1.03	.31	11.05**	2.81	1.53	5.16
	Female-only teams	.36	.27	1.73	1.43	.84	2.44
	Female first, at least one male	.50	.18	7.49**	1.65	1.15	2.36
	Male first at least one female	.08	.20	.16	1.08	.73	1.61
	Male solo	.56	.20	7.61**	1.75	1.18	2.60
	Male-only teams[b]	.00	.	.	.	.	.
Conceptual	Intercept	−1.06	.07	266.12***			
	Female solo	1.54	.16	88.74***	4.67	3.39	6.44
	Female-only teams	-.66	.20	10.52**	.52	.35	.77
	Female first, at least one male	-.50	.12	16.55***	.60	.47	.77
	Male first at least one female	-.52	.12	18.13***	.59	.47	.75
	Male solo	1.31	.10	183.69***	3.72	3.07	4.49
	Male-only teams[b]	.00	.	.	.	.	.

Cox and Snell = .12
Nagelkerke = .13
McFadden = 0.05

Notes: [a]The reference category is Quantitative; [b]This parameter is set to zero because it is redundant; *p < 0.05; **p < 0.01; ***p < 0.001.

Gender differences in collaboration patterns could be a direct gender preference for team members or a second-order effect of gender differences in main topic or research method choices. It could also be a second order effect of international differences in gender proportions of scholars. For example, in countries where tourism research is male-dominated, local collaborations will usually be exclusively male, but in more gender balanced countries, female-only collaborations are also possible. Gender collaboration effects can also be a by-product of seniority differences. For example, if a university has exclusively male senior tourism researchers but 50% female doctoral students, then doctoral student/supervisor collaborative publications would be 50% gender mixed and 50% male-only. In terms of preferences for research collaborators, the gender homophily principle grounded in social psychology and biology hypothesizes that a researcher is often motivated to collaborate primarily with individuals of the same gender, with whom the researcher is more likely to share the same ideologies and theoretical and methodological approaches (Boschini & Sjögren, 2007) – the "similar breed connection" (McPherson, Smith-Lovin, & Cook, 2001, p. 415). In contrast, gender heterophily refers to the tendency of researcher to connect with people with dissimilar attributes (Fahmy & Young, 2017). The field of networking provides some insights on why females are more opened to collaboration than males. First, females are generally more agreeable than males, and more agreeable individuals are better at networking with others (Fell & König, 2016). Second, females have higher ability to perceive, regulate, and understand emotions, which have been shown to be beneficial for collaboration (Moore & Mamiseishvili, 2012). However, male homophilic collaboration behaviors can lead to greater marginalization of female tourism researchers given their minority status and on-going struggle for legitimacy, aggravating the gender divide in academic leadership, a process further perpetuated by the Matthew-Matilda effect (Abramo et al., 2013).

We find that the choice of research methods is dependent on author

gender(s). Females are clearly over represented in qualitative research, although male solo authors and gender heterogeneous teams also display some affinity to qualitative methods. Nevertheless, the finding is consistent with the empirical results of previous studies in other fields (Diaz-Kope et al., 2019; Thelwall, Bailey, Makita, et al., 2019; Thelwall, Bailey, Tobin, et al., 2019; Williams et al., 2018). The gender divide in approaches to tourism scholarship presumably has its roots in gendered social relations in wider society (Oakley, 2000, p. 4). Debates have been fueled by feminists' critiques and rejection of quantitative in favor of qualitative methods that they perceive to hold the greatest potential for correcting androcentric biases in social science research that have emanated from the pervasive use of positivist methodologies for decades (Christou & Janta, 2019; Grant, Ward, & Rong, 1987; Pritchard, 2014; Wheaton, Watson, Mansfield, & Caudwell, 2018; Williams et al., 2018).

While mixed-methods research has increased slightly over the three decades, corroborating the results of existing studies (Molina-Azorín & Font, 2016), they are most popular among female solo and female first authors, although their use is also prevalent among other researchers. Notwithstanding the low proportion of articles based on mixed-methods in tourism, it seems that a spirit of pragmatism about combining quantitative and qualitative research prevails among all groups of authors, irrespective of their gender and the nature of collaboration (Bryman, 2006). This could possibly be because scholars now recognize that mixed-methods research in tourism "creates new understanding of intersecting power relations related to gender … and that in a broader sense working with the transformative paradigm has the potential to promote paradigm peace …" (Heimtun & Morgan, 2012, p. 287). Whereas for conceptual articles, they are most popular among solo-authors, irrespective of their gender, corroborating the finding of Vafeas (2010) in the field of accounting and finance. Perhaps because conceptual research is less time consuming to conduct because it does not involve the collection of immediate and specific empirical data to support the knowledge claims (Xin et al., 2013) or require sophisticated analytical tools, it is attractive for those who want to write solo articles (Vafeas, 2010).

5.1. Implications for academic practice

Our study provides several policy implications for redressing gender inequalities in tourism research. While much effort has been made to create more equitable policy structures to ensure that female researchers can more effectively balance research and family responsibilities (Bozeman & Gaughan, 2011), this is a time for us to re-think about our publication practices. As Mary Beard wrote in Women & Power: A Manifesto, "You cannot easily fit women into a structure that is already coded male; you have to change the structure." Female representation as first authors in tourism research publications should be increased given the substantial credit assigned to first-authorships in recruitment, tenure, and promotion committees. Initiatives are therefore required to address this. For example, research schemes stipulating a female lead researcher could increase their representation among first authors.

Policies should be also implemented to address gender imbalances in collaborative publications. A female lack of social capital and the need to balance work and family responsibilities are barriers to collaboration (Abramo et al., 2013). Measures to promote cross-gender collaboration could be implemented to protect against same gender silos, particularly in the context of male homophilic co-authorship behaviors. Funding schemes for tourism research can be specifically designed to require partnerships with female researchers to encourage gender heterogeneous teams. Universities can also attract female researchers through visiting, honorary, and research fellow appointments to foster collaboration and increasing their freedom and responsibility to collaborate at an international level (Abramo et al., 2019, pp. 1–14). There may also be benefits for doctoral training to include aspects of authorship and collaboration approaches to conducting research, showing the benefits of cross-gender collaboration for the advancement and maturation of the tourism field.

Addressing gender issues in our academic practices also requires tourism journals to adapt their editorial policies to reflect the changing nature of authorship. For example, tourism journals can acknowledge joint first-authorship for articles in appropriate cases. Such a policy already exists for journals in the other fields such as *The Lancet*. It provides an appropriate mechanism for females to co-lead impactful research projects and to obtain the academic recognition they deserve (Clark & Horton, 2019; Conte, Maat, & Omary, 2013; Rose-Clarke & Fellmeth, 2019). Furthermore, at present, most tourism journals do not have editorial policies for the roles of individual authors in joint publications. Since collaboration has become the norm in tourism research, we suggest that journals put in place policies that require co-authored articles to include statements of authorship contributions, detailing each individual's contribution. This may lessen misconceptions about secondary authors contributing less to a research article in some cases and therefore encourage more equitable academic practices (Rigg, McCarragher, & Krmenec, 2012).

Leading tourism journals have traditionally favored quantitative research (Law, Ye, Chen, & Leung, 2009), leaving less space for qualitative studies (Figueroa-Domecq et al., 2015). Articles based on quantitative approaches also receive more citations than qualitative ones (Maliniak, Powers, & Walter, 2013). Thus, the female affinity with qualitative methods may put them at a double disadvantage overall. From this perspective, the gender dimension in the use of research approaches must be addressed. Doctoral and research training programs could include considerations of the historically gendered nature of research approaches and methodological misconceptions, and how these may pose a threat to the advancement of tourism research. Doctoral programs have traditionally considered quantitative and qualitative methods as two independent and isolated approaches, while providing inadequate training on mixed methodologies. Instead, training should focus on qualitative and quantitative methods as part of a holistic and unifying process, noting that mono-methods and the polarization of research approaches are threats to social science (Onwuegbuzie & Leech, 2005). Research programs should take a gender-neutral approach to methodologies and should aim at producing pragmatic researchers equipped to use multiple approaches. This approach is in line with feminists' interest in an emancipatory social science that requires a range of methods, within which quantitative approaches would be seen as legitimate (Oakley, 2000).

6. Conclusion

Tourism researchers have made considerable progress in understanding the roots of gender inequality in academic practices and their implications for knowledge production. However, the scientific debate has focused primarily on the overrepresentation of male researchers and the alleged productivity gap. Much less attention has been paid to gender differences in first and solo authorships, collaboration, and research approaches, which are essentials components of scientific research that characterize scientific fields (Abramo et al., 2013; Abramo et al., 2019, pp. 1–14). This article attempts to fill these knowledge gaps by offering a multifaceted analysis of the intersection between gender, authorship, and research methods using 4973 articles authored by 11,033 individuals, within three leading tourism journals. The gender-sensitive approach we adopt in this study contributes to fostering a gender-conscious engagement with our academic practices that is useful to alleviate any explicit and implicit gender biases in the tourism academia. From a theoretical standpoint, the research supports the social epistemology approach to scientific inquiry that acknowledges the pervasive influence of gender on academic practices (Diaz-Kope et al., 2019).

The study goes beyond the gender-research productivity debates and its findings suggest a movement toward greater gender parity in tourism research. Nevertheless, the research demonstrates that authorship,

collaboration patterns, and use of research methods are gendered forms of scholarly practices that have implications for the gender equality agenda in tourism research. While the study reveals some gender differences in research approaches, males and females are not polarized in their use of qualitative and quantitative methods. Although we found evidence of gender homophilic collaboration behaviors, gender heterogeneous co-authorships are becoming more pervasive and seem to be driven principally by female first authors. Such gender differences are not problematic per se, but can become so if they perpetuate inequality or have adverse consequences for knowledge creation. Grass-root gender equality policies are required to correct gender imbalances, while at the same time, we could all benefit from unconscious bias training to address our personal biases which could contribute to the gender equality agenda in tourism.

This study has some limitations. First, our inferences are derived only from a content analysis of published articles. The research does not include researchers' opinions on authorship, collaboration, and research methods choices that could provide additional insights on our academic practices. Second, the study considers gender as being central to our academic practices, whereas variables such as race, ethnicity, nationality, and academic position might be equally important, requiring further investigations (Bozeman & Gaughan, 2011). Third, our analysis is restricted to only three leading journals that have a long history of male editorship, while it is only very recently that *Annals of Tourism Research* is being co-edited by a male and a female. Some evidence suggest that females are more likely to submit to journals edited by a female (Brown & Samuels, 2018). Thus, analyses of a broader set of tourism journals edited by females or gender heterogeneous teams might give different findings. Finally, career gaps for caring responsibilities and the skewed gender distribution of the base population of tourism scholars in favor of males adversely influence females' research productivity and their representation as first and solo authors (Abramo et al., 2013; Bozeman & Gaughan, 2011; Fox et al., 2018). This study does not correct for these factors, which readers should take into account when evaluating the findings.

Author contribution

Robin Nunkoo has been involved in all the research process from the conceptualization of the research to the writing-up of the manuscript as in the supervision of the data collection. Michael Thelwall has been involved in the interpretation and writing-up of the results and framing the literature of the study. Jeyna Ladsawut and Sandhiya Goolaup have been involved in the data collection and analysis.

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