

AN INDEX OF HER OWN: AN INVESTIGATION OF THE PROPORTION OF WOMEN INDEXED IN EVOLUTIONARY PSYCHOLOGY TEXTBOOKS

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ABSTRACT

A gender bias that disadvantages women is ubiquitous in academia. It has been demonstrated across a broad range of domains, including grant awards and peer review. Previous research has also found that this bias is reflected in textbooks. Here we evaluated seven books on evolutionary psychology, five of which were edited volumes. We assessed whether (1) women were less likely to be indexed than men and (2) women were less likely to be a contributor to edited volumes than men. In addition, we examined which women were featured in more than one book. Using descriptive statistics and meta-analytical techniques, we found that around 1 in 4 entries in the book indexes were women, and around 4 in 10 contributors to edited volumes were women. We discuss the potential mechanisms that could produce these findings. Finally, we offer suggestions on how the inclusion of women in citations could be improved.

Keywords: Gender; Women; Textbooks; Citation; Evolutionary Psychology

Gender disparities are well documented in academia, across disciplines and outcomes (Llorens et al., 2021; Shannon et al., 2019). These include knowledge production (e.g., Bird, 2011; Mihaljević-Brandt, Santamaría, & Tullney, 2016; Sá, Cowley, Martinez, Kachynska, & Sabzalieva, 2020; West, Jacquet, King, Correll, & Bergstrom, 2013; Wheatley & Ogunlana, 2023), outcomes from peer review (Fox & Paine, 2019; but see Squazzoni et al., 2021), talk invitations (e.g., Schroeder et al., 2013), audience size at a conference (Barreto et al., 2024), tenure of a leadership position (e.g., Chowdhary et al., 2020; Llorens et al., 2021), editorial board membership (Cho et al., 2014), inclusion on reading lists (e.g., Harris, Croston, Hutti, & Eyler, 2020), prizes (Lincoln, Pincus, Koster, & Leboy, 2012), grants (e.g., Chaudhary et al., 2021; Schiffbaenker, van den Besselaar, Holzinger, Mom, & Vinkenburg, 2022), receiving adequate grant reviews (e.g., Biernat, Carnes, Filut, & Kaatz, 2020; Silbiger & Stubler, 2019), teaching ratings and salaries (Ceci, Kahn, & Williams, 2023). In (nearly) all cases, women tend to be disadvantaged compared to men (although Ceci et al., 2023 found no gender bias for grant funding, journal acceptances and recommendation letters, and an advantage for women in hiring). Other characteristics such as ethnicity or disability status exacerbate these disparities (e.g. Ginther, Kahn, & Schaffer, 2016).

In this paper, we focus on the question of gender bias in academic texts. Unless otherwise stated, we use the term gender bias to mean bias disadvantaging women (or in favour of men). A large body of research has documented that women tend to receive fewer citations than men in the scientific literature. A bias in citations has been documented in both STEM (science, technology, engineering, and mathematics) and non-STEM subjects (e.g., Caplar, Tacchella, & Birrer, 2017; Chatterjee & Werner, 2021; Dion, Sumner, & Mitchell, 2018; Dworkin et al., 2020; Fulvio, Akinnola, & Postle, 2021; Ghiasi, Larivière, & Sugimoto, 2015; Odic & Wojcik, 2020; Teich et al., 2022; Wang et al., 2021; but see Esarey & Bryant, 2018). For example, Caplar et al. (2017) estimated that women received around 10% fewer citations than expected compared to men in astronomy. This estimate is close to estimates from other STEM disciplines, for example, engineering (e.g., Ghiasi et al., 2015). Even in the social sciences, where women are more visible and/or research active, and researchers are argued to be more aware of these biases (e.g., sociology: Davenport & Snyder, 1995), a comparable disparity in citations exists.

There is considerable debate over the size of the 'citation gap' attributable to gender. In a study covering 37,000 publications by 8,500 Norwegian researchers, Aksnes, Rorstad, Piro, and Sivertsen (2011) found that women were cited less than men in four of five categories of academic rank, in four of six age groups, and in 9 of 14 disciplines. However, they argued that the citation gap was small and that ambiguity existed, suggesting that the gap is attributable in part to the volume of articles produced by men and women, respectively. That is, men produce more articles than women, and other research has also argued that men are more likely to self-cite than women (e.g., Andersen, Schneider, Jagsi, & Nielsen, 2019; King, Bergstrom, Correll, Jacquet, & West, 2017). Fox and Paine (2019) analysed over 12,000 articles from journals in Ecology and Evolution and estimated that the difference in citations between men and women was around 2%. A minority of studies has found no support for a citation gap. Thelwall and Nevill (2019) found only a small male citation advantage in journal articles from biochemistry, genetics, and molecular biology, consistent with an average male citation advantage of 0.2% (Thelwall, 2018). Some studies even found an advantage for women. For example, Hengel (2019) found that, after accounting for the higher citation rate of male Nobel Prize winners, women were cited more than men (also see Hengel & Moon, 2020). It should also be noted that the size of the citation gap depends on which metrics are chosen. For example, some authors take into account authorship position, whereas others do not. Some authors employ a large window for tracking citations (e.g., > 5 years), others do not. Wu (2024) reviews the different operationalisations of tests for the gender gap and how they are impacted by different choices. A key conclusion from their review is that part of the citation gap is attributable to the fact that women produce fewer articles throughout their career.

A discrepancy in citations and coverage of women's research as compared to men's also extends to textbooks and course curricula (Harris et al., 2020). These data suggest that work by women is less likely to be included in a textbook than that by men. An early study by Mayer (1989) examined eight human geography textbooks and found that women's work received less coverage than men's. Mathews and Andersen (2001) found that women were not adequately represented in political science books edited by men. In the life sciences, women were found to be underrepresented in textbooks (Damschen et al., 2005; Simpson, Beatty, & Ballen, 2021; Wood et al., 2020). In a sample of twelve textbooks from geosciences, Phillips and Hausbeck (2000) found that more than 9 out of 10 innovations or discoveries were attributed to men. Wood et al. (2020) examined seven textbooks in biology, and in addition to an underrepresentation of authors of colour, they found women to be underrepresented. Harris et al. (2020) evaluated 2,435 readings from 129 unique courses at an American university. They found that the mean percentage of female authors per reading was around 34%. Around one third of readings were female-led, i.e., by a female first or sole author. The highest percentage was found in the social sciences (40%), but men still outnumbered women.

Evolutionary psychology and gender bias

Our project examines evolutionary psychology and gender bias. In evolutionary biology, debates about gender bias and its relationship with feminism have been prominent (e.g., Ah-King, 2022; Gowaty, 2012; Hrdy, 1999). As a field adjacent to evolutionary biology, it is unsurprising that gender bias is also relevant to evolutionary psychology. We refer here to evolutionary psychology in the narrow sense, specifically the Santa Barbara school (e.g., Cosmides & Tooby, 1997), unless stated otherwise. This distinction between narrow and broad evolutionary psychology is common in the field (e.g., Barrett, Dunbar, & Lycett, 2002; Barrett, Pollet, & Stulp, 2014; Brown & Lala, 2024; Sear, Lawson, & Dickins, 2007). From its beginning, evolutionary psychology has had a complex relationship with both gender studies and feminism (reviews in Fisher, Garcia, & Sokol Chang, 2013; Kelly, 2014; Liesen, 2007; Vandermassen, 2005). This discussion intensified following Thornhill and Palmer (2001)'s publication on rape (Liesen, 2007). We do not aim to review the existing literature here, but we believe the current state of the field can perhaps be best summarised by the title of Liesen (2011)'s book review article: "*Feminists, Fear Not Evolutionary Theory, but Remain Very Cautious of Evolutionary Psychology*". More recently, Burch (2020) analysed the content of twenty-two textbooks on evolutionary psychology spanning 1999–2016 (27 male authors, 4 female authors). Burch (2020) found that these textbooks tended to focus more heavily on female attractiveness rather than other traits relevant to evolutionary psychology. In addition, there was an absence of the discussion of women in roles relevant to evolutionary theory (e.g., grandmothers).

Here, we focus on empirical claims regarding gender representation within the discipline. To our knowledge, there has been limited work in this area. Meredith (2013a; also see Meredith, 2013b) reviewed several data sources, particularly citations from a high-profile paper by Buss and Schmitt (2011), suggesting a lower representation of women in the discipline. Hinshaw, Reinbold, Geher, and Geher (2014) conducted a content analysis of posters and presentations at conferences relevant to evolutionary psychology. Although women's contributions seemed to increase overall (also see Geher, 2015), women were less likely to be presenting at key evolutionary psychology conferences than men (oral presentations at HBES). In response to Meredith (2013a), Schmitt (2015) argued that evolutionary psychology is relatively unbiased in its citations. However, these claims largely revolved around evaluating citations in a single paper (Buss & Schmitt, 2011) against various benchmarks rather than conducting a systematic review of the published literature.

As a comment on both Meredith (2013a) and Schmitt (2015), O'Brien (2015) examined data from editorial manager submissions to *Evolutionary Behavioral Sciences* (EBS). They found that around 40% of unique authors ($n = 201$) making submissions ($n = 91$) were women. Women were first authors on approximately 35% of the submissions. O'Brien (2015) found no evidence suggesting bias in outcomes. Although the absence of statistically significant differences is suggestive, it does not conclusively prove an absence of bias.

Current study

As discussed above, relatively little remains known about a potential gender bias in evolutionary psychology and related disciplines. In order to contribute some additional data to this debate, we examined the indexes, the alphabetical lists found at the end of books, providing page numbers for specific terms, topics, and names within the text. The indexes were from seven major recent textbooks and reference works covering evolutionary psychology. We also examined the gender of contributors to edited volumes. Our prior assumption was that fewer women than men would be indexed in textbooks and contribute to edited volumes, but we did not have any specific estimate in mind regarding the magnitude of any such difference. Our project is thus both exploratory and descriptive.

METHODS

Data source

In March 2022, we searched Amazon UK books, next to other common book publisher sites (e.g., Waterstones, Blackwell's) with the terms: evolutionary psychology textbooks. We also searched online for graduate courses on evolutionary psychology for books listed and asked colleagues for suggestions. After our initial search, we solicited suggestions via 'X' (formerly Twitter) on April 8th 2022 via a poll. All suggestions apart from Davies, Krebs, and West (2012), a book on behavioural ecology, and Boyd and Silk (2014) were already in our initial list. This led to an initial list of 73 books which we evaluated. We selected textbooks and reference works based on recency (within the last 5 years of the inception of this project (March 2022), thus excluding Barrett et al., 2002; Dunbar & Barrett, 2007, for example) and coverage. For example, we excluded textbooks focusing on a specific approach to evolutionary psychology (e.g., Neuroscience: Ray, 2012) or books by authors from evolutionary psychology but on a specific subject (e.g., Religion: Liddle & Shackelford, 2020). We also excluded books more broadly dealing with evolution and human behaviour (e.g., Boyd & Silk, 2014). We excluded 'living' online-only resources as their content could change during the project (Shackelford & Weekes-Shackelford, 2021). It is also important to note that newer editions of books have been published since we started this project. For example, Buss (2019) was updated to its seventh edition in 2024. The [Open Science Framework](#) page associated with this paper contains the full list of titles evaluated and information on the 'X' poll.

The seven textbooks and reference works selected were:

- Buss (2019) *Evolutionary Psychology - New Science of the Mind* (6th ed.)
- Shackelford (2020a) *The SAGE Handbook of Evolutionary Psychology: Applications of Evolutionary Psychology*
- Shackelford (2020b) *The SAGE Handbook of Evolutionary Psychology: Foundations of Evolutionary Psychology*
- Shackelford (2020c) *The SAGE Handbook of Evolutionary Psychology: Integration of Evolutionary Psychology with Other Disciplines*
- Welling and Shackelford (2020) *The Oxford Handbook of Evolutionary Psychology and Behavioral Endocrinology*
- Workman and Reader (2021) *Evolutionary Psychology: an introduction* (4th ed.) and
- Workman, Reader, and Barkow (2020) *The Cambridge Handbook of Evolutionary Perspectives on Human Behavior*.

Five of the textbooks and reference works selected were edited volumes (Shackelford, 2020a, 2020b, 2020c; Welling & Shackelford, 2020; Workman et al., 2020). For brevity, we refer to the seven textbooks and reference works in what follows in the paper as 'textbooks'. We are, however, well aware that while Buss (2019) and Workman and Reader (2021) might be assigned as textbooks for undergraduate or postgraduate study, this is less likely to be the case for the other books. We believe that the other books are unlikely to be assigned as course reading in their entirety, though likely chapters will be used in teaching and research at postgraduate level.

Our research questions are (1) whether women were less likely to be indexed than men in evolutionary psychology textbooks and (2) whether women were less likely to be a contributor to edited volumes than men. In addition, we examined which women were featured in more than one textbook.

Coding

A research assistant and the first author completed the coding. We coded all entries for individuals listed in the index at the end of each book, provided they were an (academic) author (e.g., excluding Genghis Khan, Mark Zuckerberg or Kofi Annan), as famous non-academic figure entries might be biased toward men. We thus excluded historical figures and also famous exemplars from literature (e.g., Homer) or philosophy (e.g., Aristotle), unless they were associated with psychology, in which case they were included (e.g., William James) or where they were cited in context (for example, a famous writer is cited in the context of evolutionary approaches to literary studies, such as Jane Austen). Rarely, and mostly restricted to Shackelford (2020a), the entry was for a paper written by a journalist rather than an academic. We decided to include the entries in those few instances.

Similar to Wood et al. (2020), we relied on the author's first name to determine whether they presented themselves as a man or a woman. Where the first name was not included but rather the initials were given, we conducted a search for the cited publication and/or academic websites (e.g., GoogleScholar) to determine author gender. Where we suspected that first names could be ambivalent (e.g., Robin), we looked up the person on their university page, personal website or other source (e.g., Scholar Google) to determine coding. We acknowledge that this is a binary construction of gender and assumes that an individual's gender identity matches how they present themselves. For three authors from the index of Shackelford (2020a) and three authors from the index of Shackelford (2020b), we were unable to attribute the gender. We coded only inclusion and not the number of index entries, as the textbooks varied in layout and length; this hampers any comparison. Similarly, given that an author could be

indexed by multiple contributors to an edited volume and that volumes differ in typesetting, we did not attribute where the author was indexed in edited volumes.

We also coded all contributors to edited volumes. For contributors, we did not code introductory or concluding chapters as these are by the editors. Given the limited number of contributors, we counted contributors only once within a volume, even if they contributed to multiple chapters.

Data analysis

All analyses were conducted in R 4.2.1 (R Development Core Team, 2008). We report descriptive statistics (i.e. the proportions or percentages) and a Random Effect Meta-Analysis on the proportions via the 'meta' package (Balduzzi, Rücker, & Schwarzer, 2019; Schwarzer, Carpenter, & Rücker, 2015). We opted for random effects over fixed effects as the distribution of prevalence(s) is unknown and thus the estimate is better captured via a random effect estimation than a fixed effect estimation. The meta-analysis was estimated via Maximum Likelihood (the default recommended by the package), and the Agresti-Coull method was used for the estimation of the confidence interval. Agresti and Coull (1998) reviewed multiple methods for constructing confidence intervals and suggested a method which has better coverage and thus we opted for this method. Next, we used a fuzzy joining procedure via optimal string alignment ('OSA') of eight characters, in combination with a strict match of the first three letters of the last name, to identify which women were indexed in more than one textbook (Navarro, 2001; Robinson, 2020). Our goal here is not to compare to multiple entries of men but rather to describe which women were indexed more than once. The data, code, and analysis document are available from the [Open Science Framework](#).

RESULTS

Proportion of women indexed in textbooks

Figure 1 shows the distributions for women and men indexed in the seven textbooks. Shackelford (2020a) has the most entries overall and Welling and Shackelford (2020) has the highest proportion of women included.

Figure 1

Women indexed in Evolutionary Psychology textbooks and reference works. Note: Buss = Buss (2019); Shack.: A. = Shackelford (2020): Applications; Shack.: F. = Shackelford (2020): Foundations; Shack.: I. = Shackelford (2020): Integration; Well. = Welling and Shackelford (2020); Work20 = Workman, Reader and Barkow (2020); Work21 = Workman and Reader (2021).

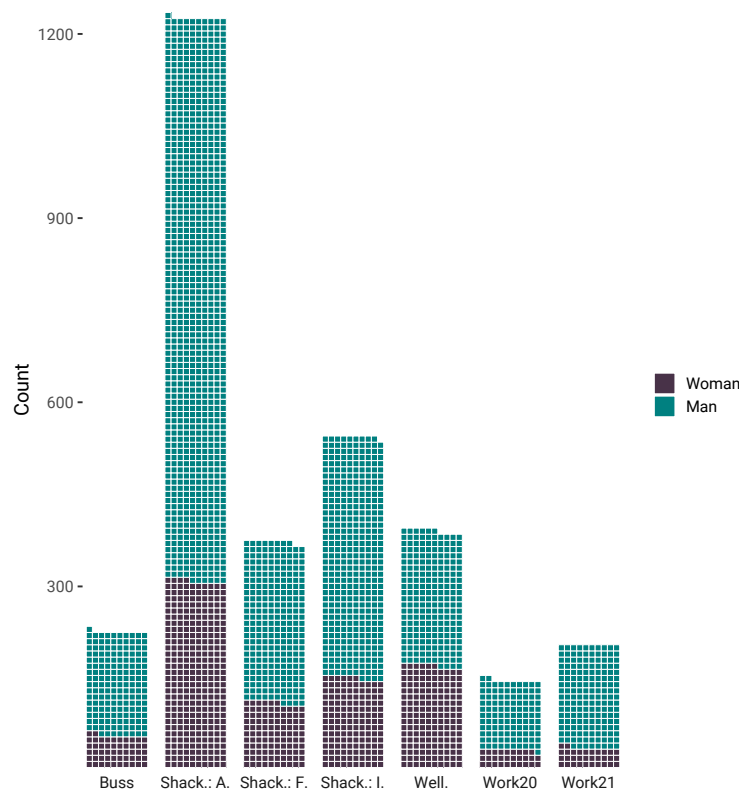
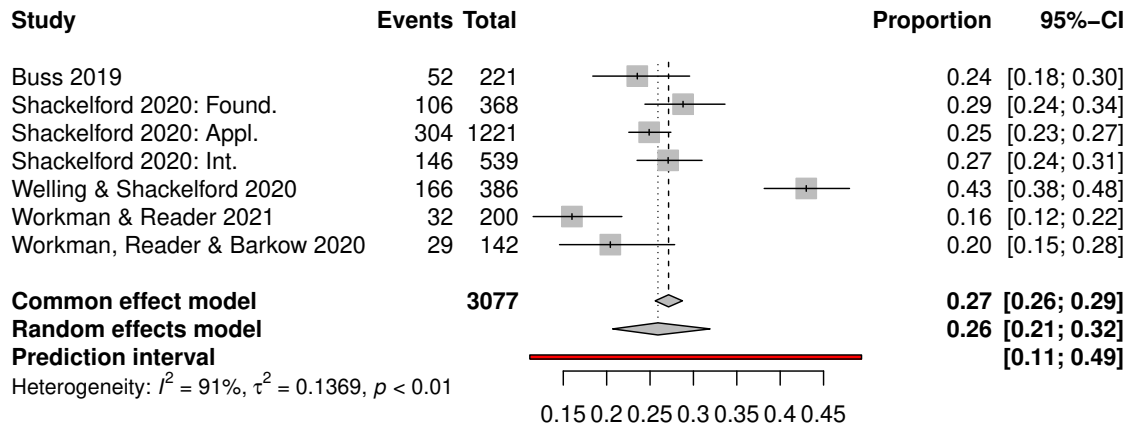


Figure 2 summarises the results of the meta-analysis for the seven textbooks. There were 3,077 entries in total of which 835 (27.1%) were women. The pooled random effect estimate showed that around 1 in 4 entries were women, 25.91%, 95% CI [20.69%; 33.43%]. Welling and Shackelford (2020) stood out as having substantially more women included than other textbooks, 43.01%, 95% CI [38.16%; 47.99%]. Each of the remaining six textbooks indexed less than 30% women. Excluding Welling and Shackelford (2020) leads to an estimate of less than 1 in 4 entries being women (random effect estimate of 23.97%, 95%CI [20.83%; 27.41%]). Excluding the book with most authors indexed overall (Shackelford, 2020a) leads to a random effect estimate of 26.03%, 95% CI [19.92%; 33.23%], which is close to the original estimate with all books of 25.91%. It is thus unlikely that the overall result is an artefact of this single volume.

Figure 2

Forest plot of proportions of women indexed ('events' are women indexed). The tips of the diamond present the 95% CI for the effect size estimates, the red bar interval represents the prediction interval.



Women receiving more than one index entry across textbooks

Our matching procedure found that 53 women (out of 835) were indexed in more than one textbook (Table 1). The majority of these women, 34 out of 53, were indexed in two out of seven textbooks. Nine women were indexed in three textbooks, and six were indexed in four textbooks (Mary Ainsworth, Laura Betzig, Elaine Hatfield, Margaret Mead, Linda Mealey, and Catherine Salmon). Anne Campbell and Maryanne Fisher were indexed in five out of seven textbooks, and Leda Cosmides was indexed in six out of seven. Margo Wilson was indexed in all seven textbooks.

Table 1
Women indexed more than once in textbooks.

	Buss 2019	Shackelford 2020: App.	Shackelford 2020: Found.	Shackelford 2020: Int.	Welling and Shackelford 2020	Workman and Reader 2021	Workman, Reader and Barkow 2020
Ainsworth, M.			x	x	x	x	
Aristegui, I			x	x			
Barrett, L.				x		x	x
Betzig, L	x		x	x			x
Brosnan, S.F.		x		x			
Brown, G.R.		x				x	
Burbank, V.	x				x		
Burch, R. L.				x			x
Campbell, A.	x	x	x		x		x
Carey, S.				x		x	
Cashdan, E.	x			x			
Chiao, J.Y.		x		x			
Cosmides, L.	x	x	x	x	x	x	
Dijkstra, P.			x		x		
Draper, P.				x	x	x	
Eagly, A.H.				x		x	
Fine, C.			x	x			
Fisher, M.L.	x	x		x	x		x
Fiske, S.T.		x	x				
Fleischman, D.	x	x					
Goldman-Rakic, P.S.				x	x		
Grabe, M.E.		x			x		
Hatfield, E.			x	x	x	x	
Harris, C.R.			x	x			
Harris, J.R.				x		x	x
Haselton, M.G.				x	x		
Hawkes, K.	x			x	x		
Hawley, P.H.	x			x			

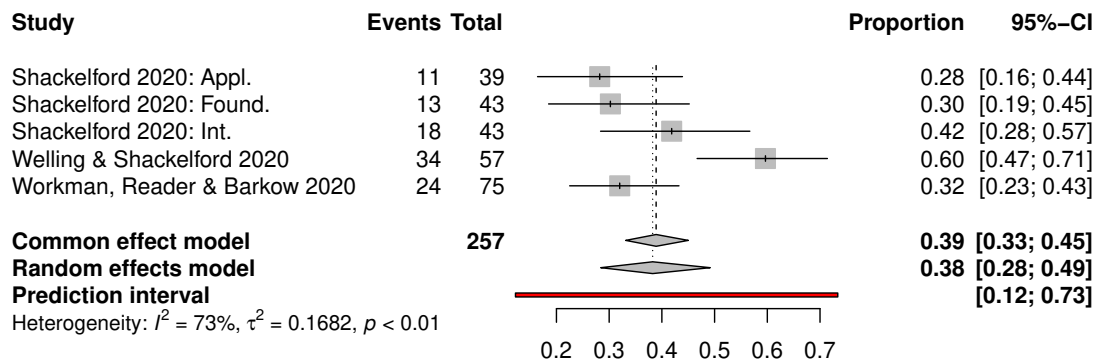
Heerwagen, J.H.	x	x		x				
Hill, S.E.	x					x		
Hopcroft, R.L.	x		x	x				
Hrdy, S.B.				x		x		x
Karmiloff-Smith, A.				x			x	
Langlois, J.H.	x					x		
Low, B.S.	x		x	x				
Mace, R.			x	x				
Mead, M.	x			x			x	x
Mealey, L.	x	x		x			x	
Neel, R.				x		x		
Petrie, M.		x	x			x		
Polderman, T.J.C.			x	x				
Salmon, C.	x	x	x					x
Scelza, B.A.			x			x		
Spelke, E.				x			x	
Still, M.C.		x		x				
Syme, K.	x	x						
Taylor, S.E.	x					x		
Quinlan, M.B.	x					x		
West-Eberhard, M.J.		x		x				
Wilson, M.	x	x	x	x		x	x	x
Yorzinski, J.L.		x		x				
van Anders, S.M.				x		x		
Zuk, M.			x				x	

Proportion of women as contributors to edited volumes

Five books were edited volumes. There were 257 unique contributors, of which 100 were women. There were 11 authors (4 women) contributing to more than one chapter within a volume. The pooled random effect estimate showed that around 4 in 10 contributors were women, 38.25%, 95% CI [28.41%; 49.16%]; Figure 3. Welling and Shackelford (2020) stood out as having substantially more women contributors than other textbooks, 59.65%, 95% CI [46.68%; 71.40%]. Excluding this volume leads to an estimate of 1 in 3 contributors being women, 33.00%, 95% CI [26.84%; 39.81%].

Figure 3

Forest plot of proportions of women contributors to edited volumes ('events' are women contributing). The tips of the diamond present the 95% CI for the effect size estimates, the red bar interval represents the prediction interval.



DISCUSSION AND CONCLUSION

We examined the proportion of women represented within seven major recent evolutionary psychology textbooks or reference works. Across all volumes, we found that around 1 in 4 author entries in the indexes were female. However, it should be noted that there is considerable heterogeneity, with one textbook in particular standing out in its inclusion of a greater proportion of women in the index. In addition, we found that, for the examined edited volumes, approximately 4 out of 10 contributors were women. However, we should note that there was one volume which contributed strongly to this estimate, with approximately 6 out of 10 contributors being female. If we exclude this volume, the estimate of female contributors drops to 1 in 3. In combination with the content analyses by Burch (2020), these data can be a starting point for conversations on issues such as whether women are selecting themselves out of the discipline.

Our data do not speak to the potential mechanisms that lead to fewer women being represented in textbooks and whether this constitutes evidence for discrimination against women. Our results could indicate the presence of a citation bias, with outputs of female authors less cited than those by men (e.g., Chatterjee & Werner, 2021). This could occur upstream of the citation process (e.g., differential recruitment and retention, Cheryan, Ziegler, Montoya, & Jiang, 2017) or during the citation process (e.g., with fewer women authors coming to mind, Yan, Arndt, Muenks, & Henderson, 2025), and be either explicit or implicit.

However, it could also be argued that there are simply fewer women to cite. For example, Schmitt (2015) suggested that the proportion of women cited in a paper on evolutionary psychology and feminism (Buss & Schmitt, 2011) was sociohistorically appropriate, as this value of 37.2% mirrored the percentage of female authors at the Human Behavior and Evolution Society meeting of 2013 (Meredith, 2013a). Some other metrics Schmitt (2015) referred to consisted of the entire publication history of the *Journal of Social, Evolutionary, and Cultural Psychology* (JSEC) where 45% of cited authors were women. A small slice of the journal *Evolutionary Psychology* (EP), two issues, found approximately 27% to be women. According to Schmitt (2015), in the broader context of authorships, evolutionary psychology does not fare comparatively worse than other disciplines. A relatively recent survey among scholars in 'Human Evolutionary Science' reported that 38.1% ($n = 579$) were women (Kruger, Fisher, Platek, & Salmon, 2022). Those numbers are similar to our results regarding the proportion of female contributors, although higher than the proportion of women indexed in the textbooks (25%).

The underrepresentation of female authors could also reflect a historical (rather than contemporary) gender bias. Historically, evolutionary psychology and related scientific fields (Sociobiology, Ethology, Evolutionary Biology) have been male-dominated fields. More generally, as noted above, women were systematically excluded from higher education and research opportunities, resulting in fewer women contributing to foundational research and theories that are often cited in textbooks. Science as an institution historically has been biased against women, with limited opportunities for women to receive an academic training: in the UK, for example, the University of London admitted its first female students ("the London Nine") only in 1868–156 years ago—while Oxford did not award degrees to women until 1920, and Cambridge did not do until the late 1940s (Carter, 2018; Delap & Griffin, 2020; University of Oxford, 2024). In part, then, our interest stemmed from whether these historical limitations on women's opportunities might still play out in some or other way in the current scientific literature. Even today, various paths could lead to bias against women (Greska, 2023). For example, women could be less likely to survive and thrive in the field of evolution and human behaviour (as in biology, e.g. Sheltzer & Smith, 2014), and could be more likely to leave the field. Women could also apply for less funding than men (Hechtman et al., 2018), be less able to travel to international meetings, or produce fewer outputs than men (Addessi, Borgi, & Palagi, 2012).

Although our descriptive data cannot explain *why* particular authors are cited, they do reveal *who* is made visible and whose contributions are likely to be taken as emblematic of the field. Given that textbooks are generally encountered in the early stages of a career, and may have a disproportionate and longstanding influence on people's perceptions of their belonging in a discipline (e.g., Good, Woodzicka, & Wingfield, 2010; Wood et al., 2020), any obvious bias might lead women to decide that evolutionary psychology (or research in general) is not for them. In combination with the topics studied (Burch, 2020), even subtler imbalances in representation could discourage women.

The impact of such representation bias on readers' perceptions, however, remains an open empirical question. Most in-text citations and reference lists give only authors' surnames, which masks gender in most languages. In fact, readers may default to assuming an author is male when only a surname is used (Gardner & Brown-Schmidt, 2024). Consequently, it may be only the highlighted (female) scholars - those presented with full names, pronouns, photographs, or boxed biographies - who meaningfully shape readers' impressions.

Whether textbook citations benefit the cited authors is also unknown. In principle, appearing in a textbook places an author's name, theory, method, or dataset before thousands of learners who may later become researchers themselves. Moreover, if textbook inclusion signals that an author is "foundational", it could enhance their reputation and, in turn, lead to additional citations or professional invitations. Documenting both sides of this dynamic, i.e. effects on readers as well as on authors, would be a valuable direction for future research.

Limitations

In addition to the limitations already mentioned, such as the degree to which these books are assigned as readings, there are several others that we need to consider. First, we examined only seven recent textbooks or reference works. Of these, only one volume was co-edited by a woman, and this was the one with higher proportions of women in terms of both contributors and index entries. A single example has limited analytic value. Another issue is that the books we selected represent a non-independent sample, given that one author, Shackelford, is an editor of four of the volumes, and Workman and Reader are also editors for two volumes. The books selected are also not a homogeneous set, with some texts more likely to be used as a textbook (e.g., Buss, 2019) for study (and others more likely to be used as reference works e.g., Shackelford, 2020a-b-c). Another consideration is that two of the books, Buss (2019) and Workman and Reader (2021), have multiple editions and may have undergone limited updating since their inception. The sample we used limits the degree to which our findings can be generalised.

Second, we are reluctant to recommend an 'ideal' number of women to index. Several potential benchmarks are available, though each should be considered with caution. A value of 50% would indicate authorship parity, but may not be reflective of the underlying proportions of active scholars in the field. By the same token, however, it seems unlikely that this value would be as low as 1 in 3, as we found here. Although we have provided some heuristics for comparison, further reflection and discussion among those active in the field will be necessary to both assess and address potential gender biases. We remain cautious about the degree to which indexes can speak to bias. For our purpose, they are primarily a data source to start conversations about representation of women in evolutionary psychology.

Third, while our procedures are similar to those of other projects of this nature (Wood et al., 2020), they cannot take into account self-reported gender categories, and coding is an imperfect process where errors can occur. Our coding scheme can misclassify individuals, given cultural differences in the kinds of names that are given to women versus men, and also the fact that many names are used by both. This coding scheme also cannot take into account self-reported gender categories (i.e., cisgender, transgender, gender-non-conforming, non-binary, and agender identities, Wood et al., 2020).

Fourth, no data are available on how the indexes are actually compiled. We have treated the data presented here 'as is', but given that, for example, one volume had substantially more authors indexed than others, how indexes are constructed likely varies not just by author but also by publisher. We currently do not know the degree to which authors versus publishers contributed to the construction and checking of these entries.

Finally, our analysis does not cover author ethnicity (e.g., Arif et al., 2021; Berhe et al., 2022) or any characteristics other than gender. Ethnicity and other information may be difficult to recover from indexes. It is possible or even likely that underrepresentation may occur in evolutionary psychology along dimensions other than the binary gender scheme we examined here.

Future directions

To take this work further, any future analysis would benefit from a consideration of the mechanisms by which a gender imbalance could arise, and what effects this imbalance might have on readers and authors. In parallel, it would be interesting to think about how such an imbalance could be mitigated. Our data show that there are plenty of female scholars one could include and, indeed, one volume revealed a male:female ratio that was much closer to parity (4 out of 10 entries being women, Welling & Shackelford, 2020). Though this might require some additional reflection, we would argue that it is not difficult to include more women in any

review of the literature. Perhaps this requires a broader definition of fields relevant to Evolutionary Psychology. These fields include but are not limited to primatology, human ethology, anthropology, and behavioural ecology. However, we also note that, when it comes to its 'core business', for example, sexual selection, textbooks (e.g., Buss, 2019) continue to cite older (albeit classic) work by Robert Trivers (e.g., Trivers, 1972) or Randy Thornhill (e.g., Thornhill, 1980), but ignore more recent and, arguably, more relevant work (given advances in evolutionary biology more generally, review in Ah-King, 2022) by, for example, Hanna Kokko (e.g., Kokko & Jennions, 2008; Kokko, Klug, & Jennions, 2012).

Individual authors have considerable power for change in this area. Each can assess their own reference lists for bias without the need for institutional change. Mott and Cockayne (2017) argues for a practice called 'conscientious engagement', whereby authors consider who they would like to 'bring along' with them. However, those most likely to take up this practice—which does require time and effort—are those who are already aware of the issue.

At the publisher level, it is possible that, for example, citation checks by author gender could move the needle on parity. If journal instructions for authors or reviewers were to highlight a citation check as one of the steps in the writing or review process, would this result in final versions with more balanced reference lists? A potential first step could be the implementation of a checklist, which could be as basic as asking authors whether they evaluated their reference list on dimensions such as gender, as there is reasonable evidence from other domains that such a practice would work (e.g., patient safety, Thomassen, Storesund, Søfteland, & Brattebø, 2014). Again, this would require resources and effort to achieve. In a time when for-profit scientific publishers have been criticised for excessive publication costs (e.g., Beverungen, Böhm, & Land, 2012; Rodrigues & Morel, 2016), reference list checks could be a way to differentiate among publishers who claim they provide added value to the dissemination process. Note that we are not claiming here that we should be including women just for the sake of parity. Including citations just based on gender could lead authors to include less relevant work and, more broadly, this type of balancing could have adverse consequences (e.g., Yoder, 1991). All that we are advocating here is a greater reflexivity when it comes to whom we cite, and we reiterate gender is but one dimension. We believe a checklist might be helpful to mitigate the extremes, in a similar way as we curb, for example, excessive self-citation, and to foster reflection.

Conclusion

This descriptive study assessed the proportion of women researchers who contribute to or are listed in the indexes of evolutionary psychology textbooks or reference works. We found that the proportions of women and men remain far from parity. Our data do not speak to bias or discrimination, and we are not arguing that parity should be the norm. Rather, we believe our paper might serve as an awareness-raising step across the field and a talking point for those who consider writing a textbook or reference work on whom to include, at least with regard to one dimension, whether they are a man or a woman.

Addressing gender bias in the sciences should lead to higher-quality research, as currently, biases may prevent contributions from underrepresented scholars from being included in our knowledge base. Achieving parity is a challenge. Gender bias is entrenched across societies, not just in institutions of knowledge production.

We do not yet know whether 'real change' in scientific citation practices is possible. However, this will not be apparent until genuine attempts have been made. We encourage researchers and publishers to consider their roles in these practices and whether they are satisfied with the status quo.

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This research was approved by the Faculty of Health and Life Sciences ethics committee at Northumbria University (Ref. 51237).

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DECLARATION

We declare that all work herein is original and our own. All authors have reviewed and approved the manuscript for submission, and it is not being considered for submission elsewhere whilst it is under consideration for *Human Ethology*.

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