

ARTICLE



<https://doi.org/10.1057/s41599-025-04666-6>

OPEN

# How many medieval and early modern manuscripts were copied by female scribes? A bibliometric analysis based on colophons

Åslaug Ommundsen<sup>1✉</sup>, Aidan Keally Conti<sup>1</sup>, Øystein Ariansen Haaland<sup>2</sup> & Bodil Holst<sup>3</sup>

A monk at his desk, copying a manuscript, is a typical image associated with the Middle Ages, but what about the women? According to a recent estimate more than 10 million handwritten manuscripts were produced in the Latin West (the Roman Catholic part of Europe) between 400 and 1500 CE with around 750000 still preserved. Despite this abundance no attempt has been made up till now to quantify women's contribution to manuscript production. Here we address the research question: What was the quantitative contribution of female scribes based on available sources? The objective of this paper is to present the first bibliometric analysis of the contribution of female scribes. The analysis is based on colophons. Colophons are short statements sometimes added to a manuscript supplying information such as name(s) of the scribe(s), name(s) of the person(s) who commissioned the manuscript, place and date of production and in some cases personal reflections from the scribe. We use the Benedictine colophon catalogue with 23774 entries and find that 1.1% (dating from around 800 to 1626 CE) can be identified with certainty as having been copied by female scribes (95% confidence interval: 0.9% to 1.2%). This is to be considered a lower-bound estimate. Using existing estimates for manuscript production and loss we may infer, under the assumption that the estimates are valid, that at least 110000 manuscripts were copied by female scribes, of which around 8000 should still exist. Our investigation provides evidence for a small, but steady contribution from female scribes throughout the Middle Ages. While the number of verifiable female scribes is low, at the same time our study suggests that there must be several female scribes and book-producing communities that have not yet been identified.

<sup>1</sup>Department of Linguistic, Literary and Aesthetic Studies, University of Bergen, Bergen, Norway. <sup>2</sup>Department of Global Public Health and Primary Care, University of Bergen, Bergen, Norway. <sup>3</sup>Department of Physics and Technology, University of Bergen, Bergen, Norway. ✉email: [aslaug.ommundsen@uib.no](mailto:aslaug.ommundsen@uib.no)

## Introduction

There are several studies into monastic scriptoria for women (Bischoff, 1966, Parkes, 1983, Robinson, 1997, Hamburger, 2016) starting with Bernhard Bischoff's famous study of Chelles in France (Bischoff, 1966). The contributions of the Birgittine nuns of Vadstena alongside the brothers is explored in scholarly literature (Hedström, 2009, Dverstorp, 2010). Others cast a wider net to cover regions in selected centuries, from the eighth century to 1500 (McKitterick, 1992, Brown, 2001, Beach, 2004, Cyrus, 2009, Lifshitz, 2014). These studies together with a few, isolated pieces of evidence such as a contemporary illustration (Fig. 1) and archaeological finds (Radini, Trom et al. 2019) show that manuscript production in female religious institutions or female participation in lay workshops occurred in different periods and in different geographical areas. Women's contributions as scribes are explored and attested in scholarly literature (Blanton et al. 2013; 2015; 2018; Saunders and Watts, 2023) as well as more popular essays and initiatives (e.g. Davis, 2018, Hudson, 2021). However, there is a knowledge gap: Despite the emerging field of quantitative codicology (Chandna et al. 2016), to date no study has tried to quantify the female scribe contribution. The role of female scribes in the Latin West during the Middle Ages has been defined within specific geographical or chronological delimitations only. This allows for in-depth analysis of the available source material, but not broad-scale conclusions. The aim of this paper is to address the research question: What was the quantitative contribution of female scribes based on available sources? How large was the fraction of the manuscripts copied by women? To provide a tentative answer to this question we conduct the to our knowledge first bibliometric analysis of the contribution of female scribes. We perform the study using colophons.

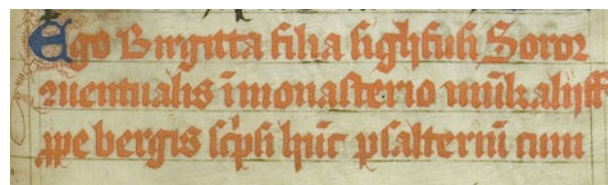


**Fig. 1** Illustration in a 12th century homiliary, showing a self-portrait of the female scribe and illuminator Guda. The text band in the letter reads: “Guda peccatrix mulier scripsit et pinxit hunc librum” (Guda, a sinner wrote and painted this book). Guda's portrait is exceptional in that it represents an actual scribe. Medieval illustrations showing females writing are most often depicting female authors. (Universitätsbibliothek Johann Christian Senckenberg, Frankfurt, Ms. Barth. 42, fol. 110 v) The colophon has entry number 5652 in the Benedictine collection, see supplementary information.

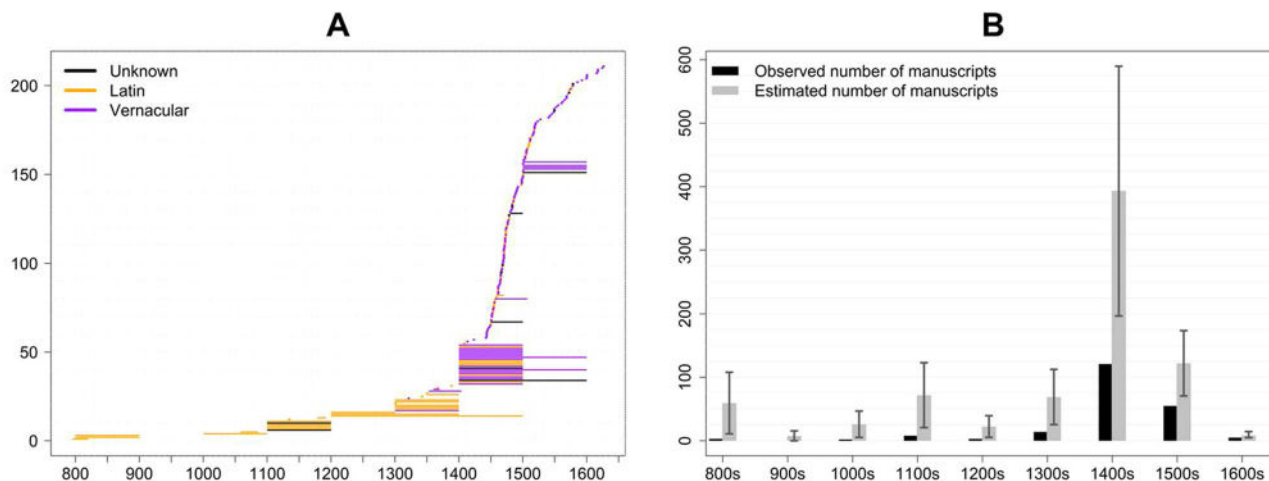
## Methodology

From 1965 to 1982, the Benedictines of the monastery at Le Bouveret in Switzerland published a catalogue listing 23.774 colophons (Benedictines, 1965-1982). The source material was primarily manuscript catalogues available at the time of compiling, but also original manuscripts. The catalogues only include work in institutional holdings, i.e. they do not reflect for example domestic literacy and thus this aspect of female penmanship is not considered here. For discussions of the development of different types and settings for manuscripts during the Middle Ages, see for example (Rouse and Rouse, 1991, North, 2015, Johnston and Van Dussen, 2017, Fickers and Riach 2015). As mentioned in the abstract, a colophon is a short statement sometimes written at the end of a handwritten manuscript. In most cases the colophon can be associated with the scribe or scribes who copied the manuscript. Based on a colophon, a female scribe can be identified either because she signed the colophon with her name or because she referred to herself as a woman (e.g., *scriptrix* or *soror*). Examples are both in Latin: “*Scriptrix donetur in celis merces scribentis*” (May the scribe be given her reward in heaven), catalogue entry nr. 21616 and in the vernacular: “*Pytt got fur die screiberyn swester Appolonia Polanderijn*” (pray to God for the scribe, sister Appolonia Polanderin), catalogue entry nr. 1296. Figure 2 depicts a section of a female scribe's colophon in Latin.

The Benedictine colophon catalogue cannot be claimed to be exhaustive and is prone to inexact information especially regarding the precise dating of individual manuscripts (Bieler, 1967, Levine, 1969). Furthermore, the compilers did not check the information derived from published catalogues against the surviving manuscripts, and therefore there is a danger of mistakes of transcription being transferred from the published catalogues into their volumes, and further errors being added. Nevertheless, the volumes represent the most comprehensive collection of colophons available. Alternative methods of gathering data, such as using the ongoing “Manuscripts datés” series, could and should be applied in future work, but is beyond the scope of this initial pilot study. Note that we have also not included disparately published notices of colophons written by female scribes for reasons of consistency (such a colophon is in a fragment now in Bergen: “*Anno domini MCCCXXVI liber iste scriptus est per sororem Margaretam Ostra Ad laudem domini nostri ihesu cuius amore orate pro ipsa prenotata scriptrice ut hic labor eius admisceatur laboribus omnium in sancta regulari vita fideliter laborantium Amen*” Bergen, the Regional state archives, archives from Rosendal). Below we present the analysis performed. We have followed the guidelines for transparency in statistical practice



**Fig. 2** Colophon written by a named female scribe in the 15<sup>th</sup> century. The full text reads: “Ego Birgitta filia sigfusii Soror conventualis in monasterio munkeliv prope Bergis scripsi hunc psalterium cum litteris capitalibus licet minus bene quam debui, orate pro peccatrice” (I, Birgitta Sigfus's daughter, nun in the monastery Munkeliv at Bergen wrote this psalter with initials, although not as well as I ought. Pray for me, a sinner) (Praha, Knihovna Metropolitni kapituly u sv. Vita, B.4/1, fol. 173). The colophon has entry number 2235 in the Benedictine collection, see supplementary information.



**Fig. 3 Observed number of manuscripts copied by female scribes vs. date of colophon.** Note that dates could only be estimated for 204 of the 254 colophons. **A** Each line or dot marks one colophon (i.e., one manuscript). The width of the line or dot gives the estimated date when the colophon was written (e.g., one colophon was dated between 795 and 819, two were dated to the 9<sup>th</sup> century, one was dated to 1134, and one was dated to between 1200 and 1500). The color of the line or dot gives the language in which the colophon was written. Unknown means that the scribe only signed with her name. **B** Black bars give the number of observed manuscripts in each century. Grey bars give the estimated number (with error bars) of manuscripts that would yield the observed number given the loss rates provided in (Buringh 2011). For more details on how the numbers were estimated see supplementary information.

presented in (Wagenmakers et al., 2021). Our bibliometric study is a so-called performance analysis (Donthu et al., 2021): The five volumes of the catalogue which list colophons by the name of the scribe (numbering 1-18951), were examined for the names of female scribes by the two Latin scholar authors of this paper. The two volumes with almost 5000 anonymous colophons (numbering 18952-23774) were also examined; if there was information that could identify the gender of the scribe, the colophon was tallied in our count. In many cases it is not possible to determine if the scribe was a man or a woman. By counting only certain cases, we produce a lower bound, an inferable minimum, for the number of manuscripts copied by female scribes. All results were cross-checked by having each of the two Latin scholar authors examining all colophons independently. In the end the results were compared. There were found to be 12 cases of disagreement, which were then discussed between the two authors, leading to a further 4 cases being included. Codes and data files used in the analysis are freely available at [https://github.com/oeh041/Female\\_scribes](https://github.com/oeh041/Female_scribes).

Calculations of loss rates are based on (Buringh, 2011). It should be noted that his loss estimates as well as his approach to historical considerations in (Buringh, 2011) have been contested in the literature (Maniaci, 2013). However, Buringh's total estimated loss rate at 92,5% is similar to (Neddermeyer, 1998 I, 80-81) who estimates a 7% survival rate for manuscripts, i.e. a 93% loss rate. The fact that their estimates differ with respect to loss rates per century would slightly alter the graph in Fig. 3B but bears no practical consequence for the overall conclusion. The topic of loss rates was also addressed in a more recent paper (Kestemont et al., 2022); However, the emphasis there is on vernacular languages (and their connection to specific cultural assemblages).

## Results

Of the 23774 colophons in the collection (Benedictines, 1965-1982), a total of 254 (were identified as having been written by female scribes, corresponding to 1.1% (95% confidence interval: 0.9% to 1.2%). A complete list of the colophons identified in this study as having been written by female scribes can be found in Table S1 (supplementary information). Of the 18951

named colophon items 204 have female names. Of the 4823 anonymous colophons, 50 could be identified as having been written by female scribes based on nouns or pronouns, 1309 could be identified as having been written by male scribes for the same reason. In both groups (named and anonymous) there are a number to which a gender cannot be assigned. This number of unidentified entries is for natural reasons proportionally higher within the anonymous group. Nevertheless, despite this difference, the percentage of female minimum presence is statistically the same in both groups.

In nine cases more than one female scribe is mentioned in a colophon (in one case as many as nine names), so that a total of 254 uniquely spelled names could be identified among the 204 named colophon items. Of the 254 names identified in the colophons, some were so similar that one could suspect that they were indeed the same scribe. These names are listed in Table S2 (supplementary information). We did not find any cases where both male and females are listed jointly in one colophon as scribes.

The given percentage of 1.1% is likely to be the absolute lower bound. Otherwise we would rely on the following assumptions to be valid, namely that 1) male and female scribes had the same inclination to write colophons, 2) manuscripts copied by males and females were equally likely to survive long enough to be included in the Benedictine colophon catalogue, and 3) the catalogue represents a random sample of the total number of manuscripts written during the Middle Ages in the Latin West. There are indications that some women might have hidden their gender by writing "male" or gender-neutral colophons and that women were less likely to write colophons at all. For example, licensed notaries—a position not open to women—were expected to record their name, diocese and title in the eschatocol of written documents (Murray, 1993). This may have promoted a practice where men were more likely to write colophons than women. Some names of female scribes may be found in a margin rather than a colophon (Treharne, 2023), making their contribution invisible in this type of study. This would violate assumption 1). A violation of assumption 2) could occur if, for example, chances were higher that manuscripts from Southern Europe would survive, and female scribes were not evenly spread across Europe.

While some research (Baroffio, 2001, Ommundsen, 2017) suggests that this is not the case, there are other indications that a lower female survival rate may be a factor. For example, a lack of institutional continuity across the caesuras of the reformation and the dissolution of the monasteries would give advantage to certain kinds of male institutions, like academic institutions and cathedrals, which would also affect assumption 3). Because violations of assumptions 1), 2) and 3) are likely to decrease the proportion of surviving manuscripts that can be identified as being written by females, the estimated proportion of 1.1% manuscripts written by females must be considered a lower bound.

Note that the estimation of such a lower bound was our aim, and not to investigate the causal relationship between two or more variables. Hence, although we did make some judgement calls in the preprocessing of the data (e.g., which names were female), this would not substantially alter our estimates. We also performed sensitivity analyses (see supplementary information) to account for uncertainty in our assumptions.

The female proportion of 1.1% coupled with the manuscript loss estimates provided in (Buringh, 2011) can be used to estimate the total number of manuscripts copied by women.

Figure 3 shows the observed number of manuscripts from the Benedictine colophon catalogue that were copied by female scribes from the early 800 s through the 1600 s. Two interesting features can be observed. Around 1400 there is a large increase in the number of vernacular colophons, and this falls together with a large increase in the total number of colophons identified as having been copied by female scribes. To investigate this further we adjusted the number of manuscripts for each century according to pr. century loss estimates given in (Buringh, 2011) (See supplementary information for a detailed discussion). The results are shown in Fig. 3B. We see that the estimated number of female scribes remains relatively constant until 1400 (within large error bars). After 1400 the number of female colophons rises significantly, especially for vernacular manuscripts. Still, as a percentage of overall book production the contribution of female scribes remains limited even though women and female institutions are active participants in book ownership and use (Neddermeyer, 1998, I, 232-36). As one would expect the numbers drop again from 1500 onwards, reflecting the greater number of books produced by printing. If we assume that the manuscripts with vernacular colophons also tend to be written in vernacular, this suggests that an increased “market” for vernacular manuscripts increased the contribution from female scribes.

## Conclusion and Outlook

Based on realistic assumptions we show that at least 1.1% of the medieval manuscripts were copied by female scribes (lower estimate). Using the loss estimate from the introductory paragraph (Buringh, 2011) it is possible to estimate that female scribes copied more than 110.000 manuscripts throughout the Middle Ages of which at least 8000 should still exist.

Only a very small fraction of manuscripts could be identified unambiguously as having been written by women. Even though this should be taken as a lower bound as previously discussed, our investigation can be seen as a support for the notion purported in (McKitterick, 1992, Miglio, 1995) that female scriptoria like Chelles are rare. However, our investigation reveals one very interesting novel insight: It is highly unlikely that the few female scriptoria described in the literature so far can account for the more than 110,000 manuscripts, which we estimate to have been written by female scribes. Thus, our investigation strongly suggests that there are female book-producing communities not yet identified or at the very least that there must have been many more female scribes than what has hitherto been accounted for.

This raises the question: what historical socio-political and socio-economic contexts apart from the known female book-producing communities supported women working as scribes during the Middle Ages?

Our study should be seen as a first step, opening new perspectives. Future work should clearly include a detailed geographical and chronological analysis of the whole colophon material in relation to time periods, as well as investigations of parish, census, or other records found in government or memory institutions. Taken together this might shed light on the question of potential unidentified female book production communities. In general, it would be interesting to investigate the geographical contribution of female scribes, see (Reynhout, 2006) for a non-gender related analysis of the Benedictine colophons, addressing, among other questions, geographical distribution. It would also be interesting to investigate what type of manuscripts have been copied by women. Future research may thus be able to reveal potential socio-political and socio-economic links to literacy, throwing light on when, why and how women worked as scribes during specific time periods. The statistical material is limited so it may not be possible to draw any conclusions, but it is worth looking into.

Finally, we would like to emphasize that quantitative, bibliometric studies made possible through the abundance of preserved manuscripts from the Middle Ages, should be perceived as complementary to detailed case studies such as those cited in the beginning. Quantitative analysis provides a means of achieving a grasp of “the bigger picture”, thus creating a useful framework for further, more detailed studies.

## Data availability

The datasets generated during the current study are available in the supplementary information. Codes and data files used in the analysis are freely available at [https://github.com/oeH041/Female\\_scribes](https://github.com/oeH041/Female_scribes).

Received: 4 January 2022; Accepted: 27 February 2025;

Published online: 08 March 2025

## References

- Baroffio G (2001) Colligere fragmenta ne pereant”. Il recupero dei frammenti liturgici italiani. *Riv Liturgica* 88:679–694
- Beach A (2004) *Women as Scribes: Book Production and Monastic Reform in Twelfth-Century Bavaria*. Cambridge University Press, Cambridge, UK
- Benedictines, DB (1965–1982). *Colophons de manuscrits occidentaux des origines au XVIe siècle*. Fribourg, Switzerland, Spicilegium Friburgensis Subsidia: Éditions universitaires
- Bieler L (1967) Review of *Colophons de manuscrits occidentaux des origines au XVIe siècle I: Colophons signés A-D*. *J Theolog Stud* 18:250–253
- Bischoff, B (1966). *Die Kölner Nonnenhandschriften und das Skriptorium von Chelles*. *Mittelalterliche Studien*. Ausgewählte Aufsätze zur Schriftkunde und Literaturgeschichte. B. Bischoff. Wiesbaden, Germany, Steiner. 1
- Blanton, V, V O’Mara and P Stoop (eds.) (2013). *Nuns’ Literacies in Medieval Europe : the Hull Dialogue*. Turnhout: Brepols
- Blanton, V, V O’Mara and P Stoop (eds.) (2015). *Nuns’ Literacies in Medieval Europe : the Kansas City Dialogue*. Turnhout: Brepols
- Blanton, V, V O’Mara and P Stoop (eds.) (2018). *Nuns’ Literacies in Medieval Europe : the Antwerp Dialogue*. Turnhout: Brepols
- Brown, M (2001). ‘Female Literacy in Anglo-Saxon England: the evidence of the ninth-century prayerbooks. *Lexis and Texts in Early English: Essays Presented to Jane Roberts*. C. Kay and L. Sylvester. Antwerp, Rodopi: 45-68
- Buringh, E (2011). *Medieval Manuscript Production in the Latin West: Explorations with a Global Database*. Leiden, Netherlands, Brill
- Chandna, S, F Rindone, C Dachsbacher, R Stotzka (2016). Quantitative exploration of large medieval manuscripts data for the codicological research. 2016 IEEE 6th Symposium on Large Data Analysis and Visualisation (LDAV)
- Cyrus, CJ (2009). *The Scribes For Women’s Convents in Late Medieval Germany*. Toronto, USA, University of Toronto Press

- Davis, R (2018) "Women Scribes: The Technologists of the Middle Ages." *The New Inquiry*. <https://thenewinquiry.com/blog/women-scribes-the-technologists-of-the-middle-ages/> [accessed 5 June 2024]
- Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM (2021) How to conduct a bibliometric analysis: An overview and guidelines. *J Bus Res* 133:285–296
- Dverstorp, N (2010). *Skrivaren och skriften: om skrift- och håndskriftproduktion i Vadstena kloster* (PhD, University of Oslo)
- Hamburger, J (2016). *Liturgical Life and Latin Learning at Paradies bei Soest, 1300–1425: Inscription and Illumination in the Choir Books of a North German Dominican Convent*. Münster, Germany, Aschendorff for the National Museum of Women in the Arts
- Hedström, I (2009). *Medelstidens svensak bönböcker : Kvinnligt skriftbruk I Vadstena kloster* (PhD, University of Oslo)
- Hudson, A (2021). All She Wrote: Female Scribes before 1500 AD <https://blogs.surrey.ac.uk/medievalwomen/2021/03/08/all-she-wrote-female-scribes-before-1500-ad/> [accessed 5 June 2024]
- Kestemont M et al. (2022) Forgotten books: The application of unseen species models to the survival of culture. *Science* 375:765–769
- Johnston, M and Van Dussen, M (2017) "The medieval manuscript book – Cultural approaches", Cambridge University Press
- Levine P (1969) Review of Colophons de manuscrits occidentaux des origines au XVIe siècle I: Colophons signés A-D. *Speculum* 44(1):107–110
- Lifshitz, F (2014). *Religious Women in Early Carolingian Francia: A Study of Manuscript Transmission and Monastic Culture* Oxford, United Kingdom, Oxford University Press
- Maniaci, M (2013) "Quantificare la produzione manoscritta del passato: Ambizioni, rischi, illusioni di una 'bibliometria storica globale'." IASOnline
- McKitterick R (1992) 'Nuns' scriptoria in England and Francia in the early middle ages. *Francia* 19(1):1–35
- Miglio, L (1995). *A mulieribus conscriptos arbitror: donne e scrittura. Scribi e colofoni: Le Sottoscrizioni di copisti dalle origini all'avvento della stampa*. E. Condello and G. De Gregorio, Spoleto for Centro italiano di studi sull'alto medioevo
- Murray JM (1993) The Profession of Notary Public in Medieval Flanders. *Leg Hist Rev* 61:3
- Neddermeyer, U (1998). *Von der Handschrift zum gedruckten Buch*, 2 vols. Wiesbaden, Harrasowitz Verlag
- North M (2015) Household Scribes and the Production of Literary Manuscripts in Early Modern England. *J Early Mod Stud* 4:133–157
- Fikkers, L, Riach, H (2015), "Manuscript, Women and Scribal Culture", Palgrave Encyclopedia of Early Modern Women's Writing
- Ommundsen, Å (2017). *A Norwegian - and European - jigsaw puzzle of manuscript fragments. Nordic Latin Manuscript Fragments. The Destruction and Reconstruction of Medieval Books*. Å. Ommundsen and T. Heikkilä, Routledge
- Parkes M (1983) "A Fragment of an Early Tenth-Century Manuscript and Its Significance." *Anglo-Saxon Engl* 12:129–140
- Radini A, Trom M, Beach A, Tong E, Speller C, McCormic M, Dudgeon JV, Collins MJ, Rühli F, Kröger R, Warinner C (2019) "Medieval women's early involvement in manuscript production suggested by lapis lazuli identification in dental calculus." *ScienceAdvances* 5:eaau7126
- Reynhout L (2006) *Formules latines de colophons*. Brepols, Turnhout, Belgium
- Robinson, PR (1997). *A Twelfth-Century Scriptorix from Nunnaminster. Of The Making Of Books: Medieval Manuscripts, Their Scribes and Readers: Essays Presented to M. B. Parkes*. P. R. Robinson and R. Zim. Aldershot, United Kingdom, Scolar Press: 73–93
- Rouse, MA, Rouse, RH (1991). *Authentic Witnesses: Approaches to Medieval Texts and Manuscripts*, University of Notre Dame Press
- Saunders, C, D Watts (2023). *Women and Medieval Literary Culture from the Early Middle Ages to the Fifteenth Century*. Cambridge University Press
- Treharne, E (2023). "Miserere, meiden." *Women and Medieval Literary Culture from the Early Middle Ages to the Fifteenth Century*. C. Saunders and D. Watts. Cambridge University Press, 27–49
- Wagenmakers E-J et al. (2021) Seven steps towards more transparency in statistical practice. *Nat Hum Behav* 5:1473–1480

## Acknowledgements

We thank the Trond Mohn Research Foundation for sponsoring the interdisciplinary research seminar where this research idea was conceived.

## Author contributions

ÅO and AKC identified the colophons according to gender and evaluated the results of the statistical analysis in a historical context. ØAH performed the statistical analysis. BH conceived, instigated and led the project and was responsible for compiling the information into a manuscript. All authors contributed to the writing of the manuscript.

## Funding

Open access funding provided by University of Bergen.

## Competing interests

The authors declare no competing interests.

## Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

## Informed consent

This article does not contain any studies with human participants performed by any of the authors.

## Additional information

**Supplementary information** The online version contains supplementary material available at <https://doi.org/10.1057/s41599-025-04666-6>.

**Correspondence** and requests for materials should be addressed to Åslaug Ommundsen.

**Reprints and permission information** is available at <http://www.nature.com/reprints>

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2025