

Women in the Copyright System

An Analysis of Women Authors in Copyright Registrations from 1978 to 2020

A special report by the United States Copyright Office





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Executive Summary

There is a growing body of evidence of a gender gap in the use of intellectual property (IP) systems around the world. Professor Joel Waldfogel, the Copyright Office's 2021 Kaminstein Scholar in Residence, conducted a new assessment of women's authorship rates in U.S. copyright registrations, with a comparison to their participation in copyright-based creative industries. This analysis reveals a complex and evolving picture of women's participation in the creative professions and their use of the registration system.

While the annual number of copyright registrations has remained relatively stable since 1978, the effective date of the current Copyright Act, the share of registrations that list women authors has risen across nearly every category. In 2020, over 38.5 percent of all copyright registrations were granted to women authors, as compared to 27.9 percent in 1978. Authorship shares vary significantly among registration categories. Some categories, however, notably *literary works*, have reached or are moving toward gender parity, while others demonstrate moderate but sustained growth in female authorship.

Copyright registration data and occupational data exhibit a positive relationship: occupations with higher shares of women participants have higher shares of registrations listing women authors. Nevertheless, with limited exceptions, the share of women authors in registrations is substantially smaller than women's participation rate in corresponding occupations. This suggests a gender disparity exists in the usage of the copyright system. Additional outreach and education may assist in closing the gap.

Quick Facts

The share of copyright registrations overall listing women authors has risen over time.

- In 1978, the effective year of the current Copyright Act, women represented only 27.9 percent of authors of registered works. By 2012, this number rose to about 36 percent, and as of 2020, women represented 38.5 percent of authors of registered works.

Women's proportional share of authorship differs across copyright categories, but it has risen in most, and achieve gender parity in some categories.

- Women authors are listed in roughly 50 percent of registrations for *nondramatic literary works*.
- Since 1978, the proportional share of women authors in motion picture registrations has more than doubled, and it has nearly tripled for *machine-readable work or computer program* registrations.
- Women's share of authorship in performing arts registration categories demonstrates moderate but sustained growth, now at 20 to 30 percent of registered works.

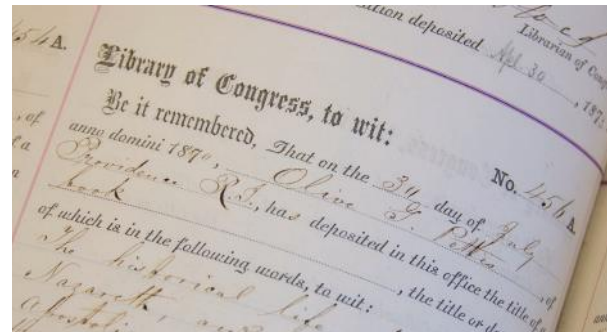
Across nearly every category, women make up a smaller share of authors in registrations than they do of participants in corresponding creative occupations, but the gap is closing.

- Data from 2003 to 2020 show that on average women authors were 21.6 percent less prevalent among copyright registrations than among participants in associated copyright-related occupations.
- From 2003 to 2010, women authors were roughly 27.5 percent less prevalent in registration records than they were in the corresponding occupations, but from 2011 to 2020, the gap shrank to 14.5 percent.

Introduction

In 1870, the year that copyright registration was centralized in the Library of Congress, Olive G. Pettis became the first woman author known to register a copyright there.¹ Millions of women have now followed in her footsteps. Copyright has always provided a valuable tool for women seeking to disseminate or commercialize their works²—and one which is particularly important in today's expanding creative economy.³

There is a growing body of evidence of a gender gap in the use of intellectual property (IP) systems around the world.⁴ Underrepresentation of women within any area of IP could result in “lost Einsteins”⁵ and a missed opportunity to enrich our culture and knowledge base and expand economic opportunity. Research by former Copyright Office Kaminstein Scholar in Residence⁶ Professor Robert Brauneis



A photo of the registration by Olive G. Pettis, the first woman author known to register a copyright with the Library.

examined copyright records from 1978 to 2012 and revealed significant differences in registration rates between men and women, and among other demographic groups.⁷

- 1 Alison Hall, “The Copyright Office Celebrates Women,” *Copyright: Creativity at Work*, March 8, 2018, <https://blogs.loc.gov/copyright/2018/03/copyright-office-celebrates-women/>. On May 31, 1790, the first copyright law was enacted under the U.S. Constitution, requiring works to be registered in the local U.S. district court where the author or proprietor lived. In 1870, the second general revision of copyright law established the Copyright Office and centralized copyright activities, including registration and deposit, in the Library of Congress. On July 30, 1870, Olive G. Pettis registered *The Historical Life of Jesus* as author and proprietor. Twelve days earlier (July 18, 1870), Adra E. Bradbury had registered as proprietor a work of which she was not the author, *The New Golden Censer* by William B. Bradbury. “Early Copyright Records Collection, 1790 to 1870,” Library of Congress, accessed February 23, 2022, <https://loc.gov/collections/early-copyright-materials-of-the-united-states/about-this-collection/>.
- 2 Copyright affords authors exclusive rights in their original works of authorship as soon as they are fixed in a tangible medium of expression. 17 USC § 102. Registering a work with the U.S. Copyright Office is not required for copyright protection; timely registration does, however, provide a number of benefits, including the ability to sue for infringement and seek statutory damages and attorney’s fees. See U.S. Copyright Office, *Copyright Basics (Circular 1)*, September 2021, <https://www.copyright.gov/circs/circ01.pdf>.
- 3 From 2017 to 2019, average annual growth in the production of copyright-intensive arts and cultural goods and services was 4.1 percent. In 2019, copyright-intensive industries contributed \$1.2 trillion to the U.S. economy. National Endowment for the Arts, *U.S. Arts Economy in 2019: A National Summary Report*, March 2021, 9, <https://www.arts.gov/sites/default/files/SummaryReportAccess.pdf>; See also Andrew Toole, et. al., “Intellectual Property and the U.S. Economy: Third Edition,” USPTO, March 2022, <https://www.uspto.gov/sites/default/files/documents/uspto-ip-us-economy-third-edition.pdf>.
- 4 “Gender Equality, Diversity and Intellectual Property,” WIPO, August 5, 2014, <https://www.wipo.int/women-and-ip/en/>; “Innovation Gender Gap,” WIPO, accessed May 10, 2022, https://www.wipo.int/about-ip/en/ip_innovation_economics/gender_innovation_gap/index.html.
- 5 It has been posited that a lack of exposure to innovation among women and historically marginalized individuals and the resulting failure to harness the innovative potential of large swaths of the population has resulted in “lost Einsteins.” Alex Bell, Raj Chetty, Xavier Jaravel, Neviana Petkova, and John Van Reenen, “Who becomes an inventor in America? The importance of exposure to innovation,” *The Quarterly Journal of Economics* 134, no. 2 (May 2019): 647–713.
- 6 Through the Abraham L. Kaminstein Scholar in Residence Program, the Copyright Office invites leading academics with a demonstrated commitment to the study of copyright law and policy to conduct research and work on mutually beneficial projects at the Office.
- 7 Robert Brauneis and Dotan Oliar, “Copyright’s Race, Gender and Age: A First Quantitative Look at Registrations,” (GWU Law School Public Law Research Paper No. 2016-48; GWU Legal Studies Research Paper No. 2016-48, August 29, 2016, <https://ssrn.com/abstract=2831850>); Robert Brauneis and Dotan Oliar, “An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants,” (86 George Washington Law Review 46 (2018); Virginia Public Law and Legal Theory Research Paper No. 2018-23, April 7, 2018, <https://ssrn.com/abstract=3158474>).

Recent efforts in both the public and private sectors to assess the gender gap in intellectual property have focused largely on women's participation in the patent system.⁸ The U.S. Patent and Trademark Office (USPTO) found that in 2016, only 12 percent of inventor patentees in the United States were women,⁹ increasing to 12.8 percent in 2019, with 21.9 percent of all patents in that year including at least one woman inventor.¹⁰

At the Copyright Office's request, Professor Joel Waldfogel, the 2021 Kaminstein Scholar in Residence, has undertaken a new assessment of women's authorship shares in copyright registrations, with a comparison to their participation in copyright-based creative industries.¹¹

The first findings in this report update portions of the earlier research by Professor Brauneis with new data through the year 2020. These eight additional years of data provide insights into the current state of gender representation in the copyright registration system. The second set of findings compares women's registration rates with their participation rates in creative occupations.

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- 8 Examples include the November 2019 USPTO report, *Progress and Potential: A profile of women inventors on U.S. patents*, <https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential-2019.pdf>; the July 2016 Institute for Women's Policy Research report, *The Gender Patenting Gap*, <https://iwpr.org/iwpr-general/the-gender-patenting-gap/>; and the March 2020 WIPO research on women inventors, *Share of Women Inventors Increasing, but Gaps Remain*, https://www.wipo.int/women-and-ip/en/news/2020/news_0001.html#:~:text=Preliminary%20WIPO%20statistics%20reveal%20that%20in%202019%20less,percent%20in%201995%20to%2018.7%20percent%20in%202019.
- 9 "Study of Underrepresented Classes Chasing Engineering and Science Success (SUCCESS) Act of 2018," USPTO, last modified August 11, 2020, <https://www.uspto.gov/ip-policy/legislative-resources/successact>.
- 10 USPTO Office of the Chief Economist, *Progress and Potential: 2020 update on U.S. women inventor-patentees*, July 2020, <https://www.uspto.gov/sites/default/files/documents/OCE-DH-Progress-Potential-2020.pdf>. ("USPTO Progress and Potential Report"). This research, as well as the research and recommendations presented in the SUCCESS Act Report, provided a foundation for the formation of the Council for Inclusive Innovation, which brings together government officials, industry, academia, and the nonprofit sector. USPTO, About the Council for Inclusive Innovation, <https://www.uspto.gov/initiatives/equity/ci2/about>.
- 11 Joel Waldfogel, "Women and the Creation of Copyright Protected Content" (unpublished working paper).

Data and Methodology

This report presents the share of women authors in copyright registrations and evaluates registration rates in the broader context of women working in the creative economy. It is based on a combination of copyright registration records and other publicly available data.

Copyright Registration Data

The Copyright Office registration data consist of over 20 million records dating from 1978 to 2020.¹² While the Office does not collect information on the demographic characteristics of registrants, registrations include the author's first name in about 13 million records. These 13 million records¹³ provided the primary data for Professor Waldfogel's analysis.¹⁴

Statements of authorship in copyright registration records (indicating that the author is a woman) as opposed to statements of copyright ownership (indicating that a woman is the rights

holder but not necessarily the author) presented a key variable. In the vast majority of records analyzed (99.8 percent), however, the author and ownership claimant were the same.¹⁵

The records analyzed span twenty-nine different categories of works based on internal Copyright Office classifications.¹⁶ These categories have evolved over time,¹⁷ and do not correspond one-to-one with the classes of work listed in section 102 of the Copyright Act. For example, works internally categorized as *multimedia and kits* could be classified for copyright law purposes as visual art or literary works depending on the kit contents.¹⁸

Inferring Author Gender from Names

Inferences about gender may be drawn from first names, which are generally given at birth, usually reflecting biological sex.¹⁹ To infer the gender of registrants, names on copyright records

12 The reference dataset used for the report, available on copyright.gov, includes records from January 1, 1978, to July 8, 2021. As the registrations from January 1, 2021, to July 8, 2021, did not span a full year, they were not considered for the purposes of this report.

13 Some types of registration allow for a single registration to cover multiple works by the same author. Because the registration data do not systematically indicate the number of underlying works, the analysis treats each registration as a single work by the same author. If there are systemic differences in the size of collections submitted by men compared to those submitted by women, then a sample count of registrations may misstate the magnitude of the gender difference in the volume of works created by women authors.

14 About seven million records did not contain a first name. The vast majority of those seven million listed corporate entities as claimant and did not list an author's first name that could be included in the name-based gender analysis. Many records lacking an identified author may be works for hire, and women may make up a different share of the unidentified versus identified authors. Records were further excluded if an author's name could not be matched with a name index, the name could not be assigned a probabilistic likelihood of being male or female, or if a field critical to the evaluation, for example, the type of work, was blank.

15 Compare 35 USC § 111. See USPTO Progress and Potential Report, 9–10.

16 To provide some means of categorizing the nature of the work registered, Copyright Office staff assign one or more retrieval codes to each record. Retrieval codes in use changed in 1983. Certain codes, such as small household items, were discontinued and subsequent similar works were categorized under new groupings.

17 For many years, the Office accepted computer programs as either a "computer program" or "text" literary work. This practice ended following updates to the *Compendium of U.S. Copyright Office Practices, Third Edition* in 2014.

18 *Multimedia and kits* consist of material comprising two or more distinct media types, such as educational kits for teachers, no one of which is identifiable as being of primary importance and which is not described by another retrieval code.

19 Sex typically refers to biological or physiological attributes. The concept of gender includes a variety of social constructs that vary from society to society and change over time. This report uses the terms "women," which may be associated with gender, and "female," which may be associated with sex, to represent the aggregate group of individuals analyzed and acknowledges that this may not accurately reflect the individual identity of some authors. "Gender and health," World Health Organization, accessed February 23, 2022, https://www.who.int/health-topics/gender#tab=tab_1.

were assigned to genders in two ways. Initially, first names were matched to names in the World Intellectual Property Organization (WIPO) name database. This database includes 173,723 distinct first names that are assigned to be either male or female. For names in the copyright data that do not match to the WIPO data, matches were made to Social Security name records that indicate whether each first name is predominately female or male. The two methods provided a total of 182,967 first names with a gender match, accounting for 96.1 percent of the copyright records that include a named author.

Occupation Data Source

Information on the gender of persons working in copyright-relevant occupations was obtained from publicly available U.S. Bureau of Labor Statistics (BLS) data.

20 See *Guidelines for producing gender analysis from innovation and IP data*, WIPO, February 25, 2022, <https://www.wipo.int/publications/en/details.jsp?id=4588>.

For certain categories, such as *nondramatic literary works*, women authors have achieved parity with or surpassed registration rates by men, while other categories, including those more closely related to scientific and technological areas, show lower shares of participation by women authors.

Key Findings

While the annual number of copyright registrations has remained relatively stable since 1978, the effective date of the current Copyright Act, the share of registered works listing women authors has risen across nearly every category. However, the increase is not uniform across categories of works. For certain categories, such as *nondramatic literary works*, women authors have achieved parity with or surpassed registration rates by men, while other categories, including those more closely related to scientific and technological areas, show lower participation shares by women authors.²¹

Gender Diversity in Copyright Registrations

In 1978, women represented only 27.9 percent of authors of registered works. By 2012, this number had risen to about 36 percent²² and, as of 2020, to 38.5 percent. This gain amounts to a 6.9 percent increase in the share of women authors identified in copyright registrations from 2012 to 2020. Figure 1 demonstrates the growth in the share of women authors across all registration categories. In 2020, women constituted 38.5 percent of all authors, and 41.9 percent of all works had *at least one* female author.²³

Share of Registrations with a Female Author

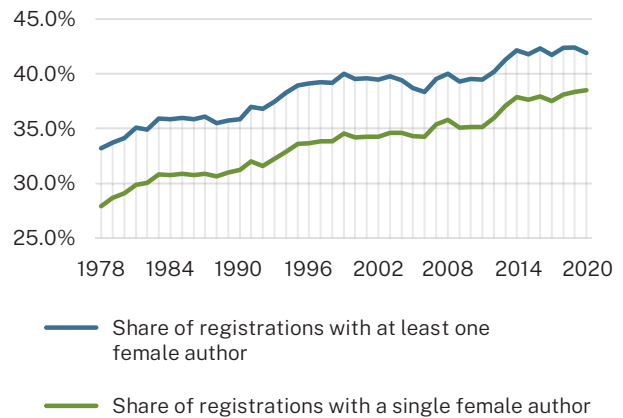


Figure 1 – Share of copyright registrations in which at least one author is a woman.

As noted above, works of authorship are assigned categories by the Copyright Office during the registration process for internal organizational purposes. The female share of authors identified in registrations varies significantly across those categories, as summarized in Figure 2. Cumulative data from registration records between 1978 and 2020, show the lowest rates of authorship by women in *architectural drawing* registrations (11.9 percent)²⁴ and the highest rates in *multimedia and kit* registrations (48 percent).

21 Although women authorship rates are lowest in science and technology-related categories, including *machine-readable works or computer programs* and architecture-related works, the rates are higher than the women inventor rate for patents (defined as the share of U.S. inventors receiving patents who are women) which reached 12.8 percent in 2019. USPTO Progress and Potential Report.

22 Robert Brauneis and Dotan Oliar, “An Empirical Study.”

23 While some copyrighted works have more than one author, multiple authorship is less common than multiple inventorship in patents. Accordingly there is little difference between the female share of authors overall and the share of copyright registrations listing at least one female author. Compare USPTO Progress and Potential Report, 4, 12 (showing a growing gap between the percent of patents with at least one female inventor and the women inventor rate).

24 From 1978 to 1983, architectural drawings and mechanical drawings were classified as *technical drawings or models*. During this time, women comprised 14.1 percent of the authors of registered *technical drawings or models*.

Average Share of Women Authors by Category of Work from 1978 to 2020

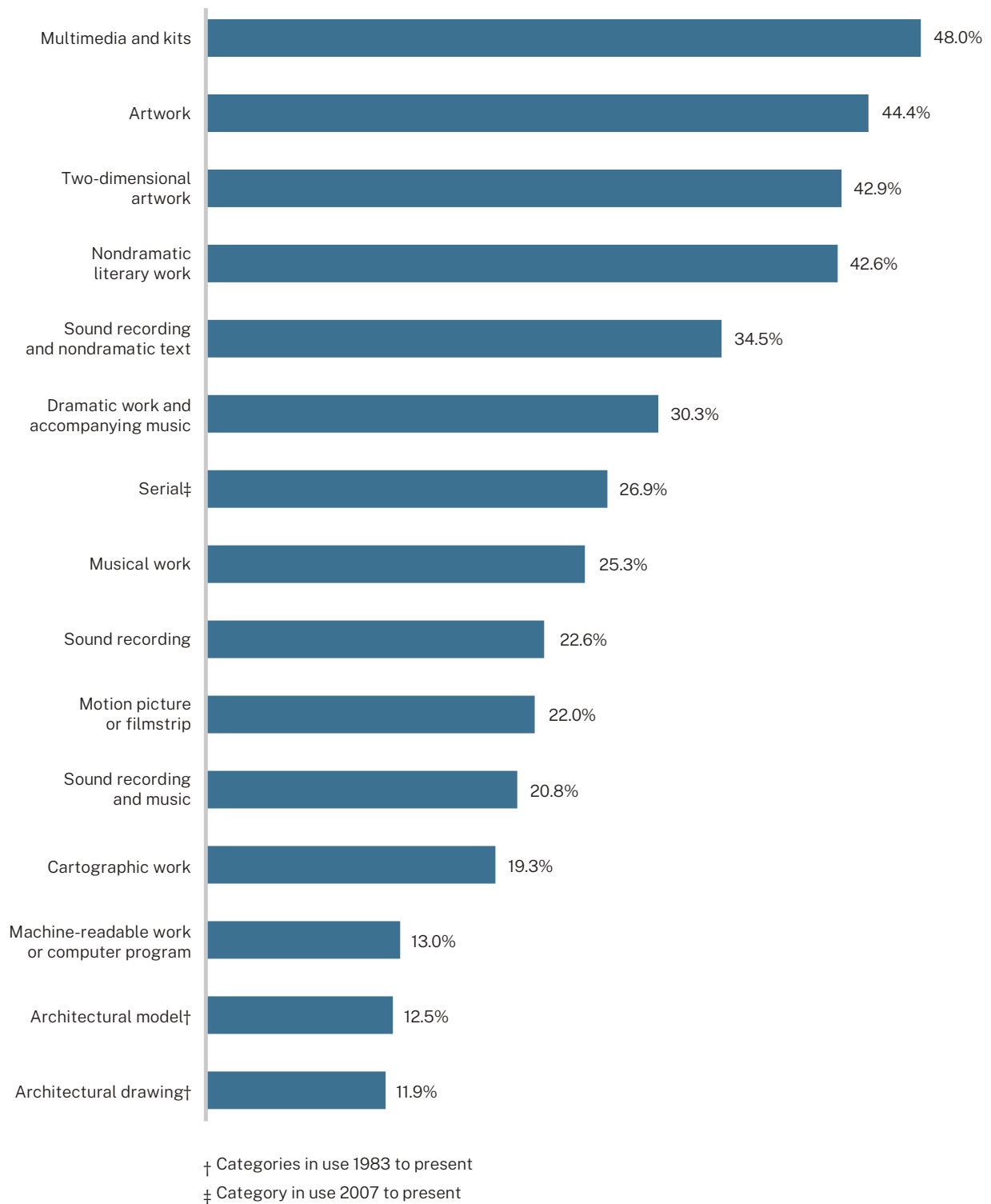


Figure 2 – Average share of women authors in registration data from 1978 to 2020 by category.

Share of Women Authors in Copyright Registrations 1978 vs. 2020

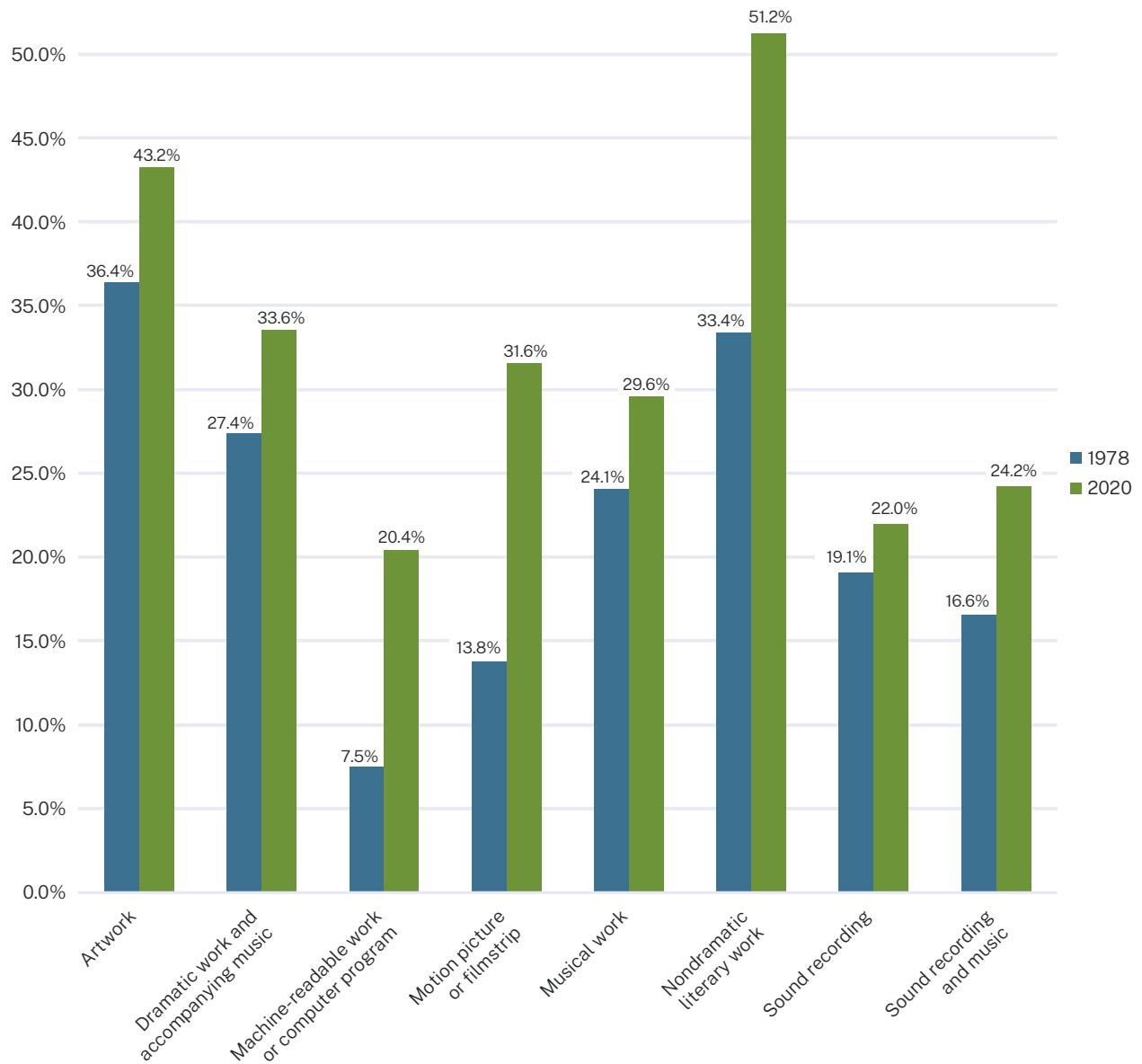


Figure 3 – Share of women authors in registration data in 1978 and 2020 by category.

Over the past forty years, however, the female share of authors listed in copyright registrations has increased in each category, and is now generally higher than the multi-decade averages

shown in Figure 2 above. Figure 3 presents the increase in the female share from 1978 to 2020 and shows a substantial rise for some categories of works, while others have remained relatively stable.

In 1978, women represented roughly one-third of the authors listed in copyright registrations for *nondramatic literary works*. As of 2020, that share had risen to over 51 percent.

Registration Rates by Category of Work

A closer examination of copyright registrations over time reveals a staggered journey for women authors, rather than a consistent path.

Nondramatic Literary Works

Nondramatic literary works, such as fiction, nonfiction, and poetry, are among the most frequently registered categories of works at the Copyright Office. In 2020, they represented nearly one-third of all works registered.²⁵ Women literary authors have taken, and continue to take, advantage of the benefits of copyright registration in substantial numbers. Over 42.6 percent of the authors of *nondramatic literary works* registered from 1978 to 2020 were women.

Disaggregating the data by time period also reveals an overall positive trend. In 1978, women represented roughly one-third of the authors listed in copyright registrations for *nondramatic literary works*. As of 2020, that share had risen to over 51 percent.²⁶

Share of Women Authors in Nondramatic Literary Work Registrations

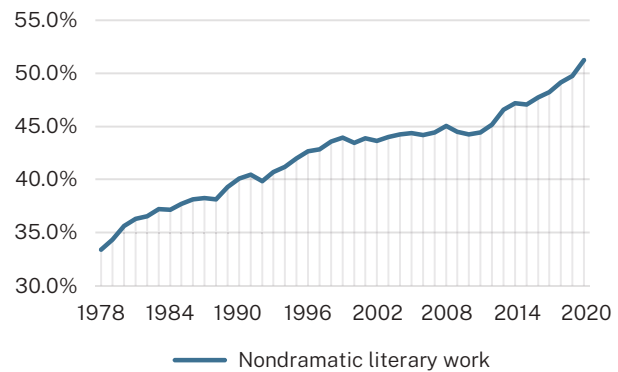


Figure 4 – Share of women authors in *nondramatic literary work* copyright registrations from 1978 to 2020.

Works of Art

Registrations of *artworks*²⁷ by women authors have exhibited a complicated trajectory and history. From 1978 to 1983, the Copyright Office's internal category of *artwork* referred exclusively to sculptural works. Other visual artworks were sorted into separate categories, including *textiles*, *jewelry*, and *photographs*.²⁸ In 1978, women authors

25 Computer programs are protected as *literary works* under 17 USC § 101. The Copyright Office's Annual Reports include computer programs in the calculation of the total of *nondramatic literary work* registrations, and the one-third figure quoted above from the 2020 Annual Report includes computer programs. However, in the Office's more granular organizational categories used for this analysis, *nondramatic literary works* include works of a nondramatic literary nature, including volumes, multiple volumes, leaflets, folders, sheets, nonbook textual materials, serials (until 2007), and papers prepared for oral delivery. Computer programs are separately categorized as *machine-readable works* or *computer programs*, which are afforded an independent section in this report. However, as noted above, until 2014 the distinction was not consistently applied.

26 Similar to registrations for *nondramatic literary works*, as of 2020 the less voluminous category of *sound recordings* and *nondramatic textual works* has also reached gender parity, with over 50 percent of registrations listing women authors. *Sound recordings* and *nondramatic textual works* as a Copyright Office organizational category consists of works covering both the sound recording and the underlying literary work (in use 1978–present).

27 The analysis of *artworks* above included over one million records and thus is the third-largest category of records analyzed. Works of visual art were at times assigned various organizational codes at a more granular level, for example, *original works of art* and *two-dimensional works of graphic and fine art*.

28 Starting in 1983 the following organizational categories were combined into *artworks*: *toys, games, banks, and dolls*; *small household items*, including wallpaper, dinnerware, menus, wastebaskets, hampers, silver, lamps, ashtrays, nontextile napkins, placemats, etc.; *technical drawings and models*, including architectural drawings and mechanical drawings; *jewelry*, including graphic designs for jewelry; *two-dimensional works of fine and graphic art*, including original works, reproductions, prints and pictorial illustrations, banknotes, certificates, greeting cards, notepaper, dust jackets, postcards, etc; *commercial prints and labels*, including record jackets, packaging for merchandise, advertisements, etc.; *photographs*, including slides; sculptural works, including figurines, statuettes, and statues; and *textile fabric*, including lace, needlework, bedspreads, rugs, shirts, scarves, cloth napkins, placemats, etc.

represented 36.4 percent of authors in (sculptural) *artwork* registrations. The share of women authors in other visual arts-related registrations from 1978 to 1983 varied significantly; 85.2 percent of *textile* registrations listed female authors, as did 43.1 percent of *two-dimensional art* registrations and 25.8 percent of *photograph* registrations.

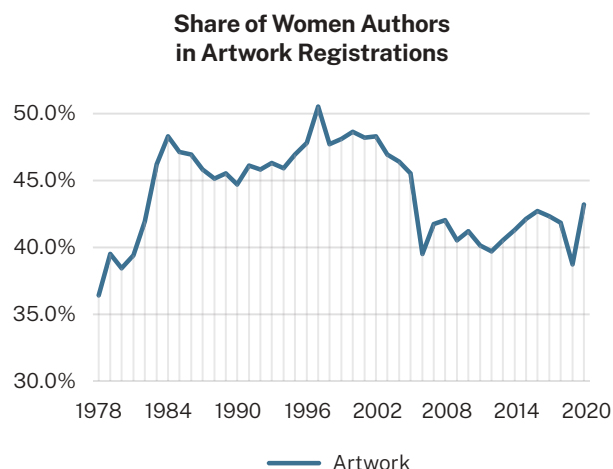


Figure 5 – Share of women authors in *artwork* copyright registrations from 1978 to 2020.

In 1982, women authors were listed in 41.9 percent of *artwork* (sculptural) registrations. The internal organizational code for *artwork* was revised in mid-1983 to include multiple forms of visual art, some of which had higher shares of female authorship, and that year the women's share of authorship in total *artwork* registrations rose to 46.2 percent.²⁹ In 1984, in the first full year of the expanded category of *artwork*, 48.3 percent of artwork registrations listed female authors. The share of women authors in all *artwork* registrations dropped to 39.5 percent by 2006 before stabilizing at just above 40 percent thereafter. The cause of this drop is not clear, and the Office is reviewing the potential impact of various factors.³⁰

Performing Arts

Categories related to the performing arts reveal a wide range of registration rates by women authors. The numbers in music-related fields are notably low. The cumulative 1978–2020 data show that only about 25 percent of *musical works*³¹ and 21 percent of *sound recording and music*³² registrations list female authors.

29 The potential impact of each added visual arts category upon the overall share of female authorship in the combined *artwork* category would vary depending on the volume of registrations for a particular type of work. For example, some categories, such as *textiles*, had higher shares of female authorship (85.2 percent) but relatively low volumes of registration (only 3,603 textile registration records 1978–1983), but the addition of other categories, which historically saw higher registration volumes but lower proportional shares of women authors, such as *two-dimensional works of art* (36,855 registrations from 1978 to 1983, 43 percent women authorship share), would temper the impact of smaller volume categories. While the close timing of the category reorganization and the increase in the proportional share of women authors in *artwork* registrations is notable, direct causation cannot be concluded.

30 Two Office actions may have had an impact on *artwork* registrations by women. First, in the early 2000s, the Office created a group option to register multiple photographs in one application. Until recently, the ability to identify group registrations of photographs or ascertain the number of works in a group registration presented a challenge point, so the potential impact of group registrations on the share of female authorship in *artwork* registrations that occurred before recent updates cannot be easily ascertained. A change in Office fees presents the second potential impact. In July 2006, the Office increased its basic registration fee for the first time since 1999. Historically fees and registration volumes have exhibited some degree of connection. See Zvi S. Rosen and Richard Schwinn, “An Empirical Study of 225 Years of Copyright Registrations,” *Tulane Law Review* 94 (August 2020): 1037–38, <https://ssrn.com/abstract=2643075>. The 2017 Fee Study Report prepared for the Office found that basic fee registrations had an elasticity of -0.32, reflecting applicants' level of sensitivity towards changes in fees. See Booz Allen Hamilton, 2017 *Fee Study Report* (2018), https://www.copyright.gov/rulemaking/feestudy2018/fee_study_report.pdf. It is possible that women authors considering *artwork* registrations are more price-sensitive than authors of other works, as a drop in registrations was not cross-categorical. Beyond 2006, however, the share of female authors in *artwork* registrations does not appear to drop at times which correspond to fee increases.

31 *Musical works* as a Copyright Office organizational category consists of works of musical compositions (in use 1978–present).

32 *Sound recordings and music* as a Copyright Office organizational category consists of works covering both the sound recording and the underlying musical work (in use 1978–present).

The share of registrations by women authors in each performing arts category has been relatively stable over time.

On the opposite end of the spectrum, records from 1978 to 1983 show that 56.1 percent of *choreography* registrations featured female authors. In 1983, the Office began to classify choreographic works in categories corresponding to their method of fixation (for example, in a motion picture or dramatic work). Unlike *artwork* registrations, the categories to which choreography was reclassified did not experience a contemporaneous increase in the share of women authors.³³ While recent trends in *choreography* registration rates are not readily available, they present an opportunity for further analysis.

Despite this variation, the share of registrations by women authors in each performing arts category has been relatively stable over time, particularly when compared to the double-digit increases for other categories of works.

Registration rates for *sound recordings*³⁴ with women authors were 19.1 percent in 1978 and had only increased to 22 percent in 2020. *Musical works* likewise demonstrated an overall increase in registration by women authors of about 5 percent, with 24.1 percent of *musical works* registered to women authors in 1978 and 29.6 percent as of 2020. Registrations of *sound recordings with music* showed larger representational gains, with women authors identified in 16.6 percent of registrations in 1978 and 24.2 percent in 2020. While the overall trajectory is upward, the rate of progress has been slower than in many other registration categories.

Motion Pictures

In 1978, only 13.9 percent of motion picture registrations listed women authors. In 1983, the Copyright Office organizational category of *motion*

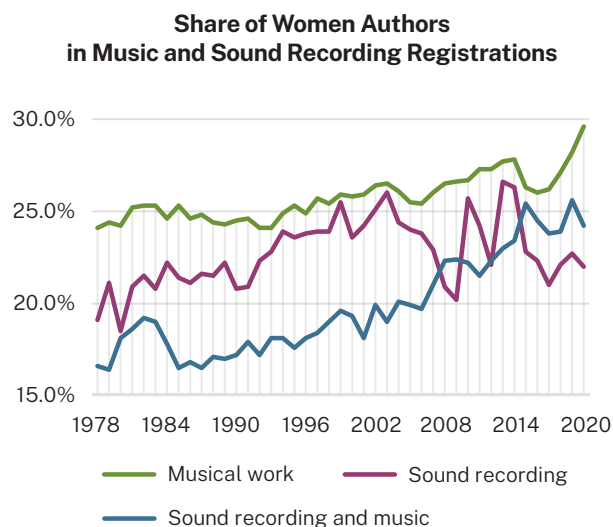


Figure 6 – Share of women authors in *musical work*, *sound recording*, and *sound recording and music* copyright registrations from 1978 to 2020.

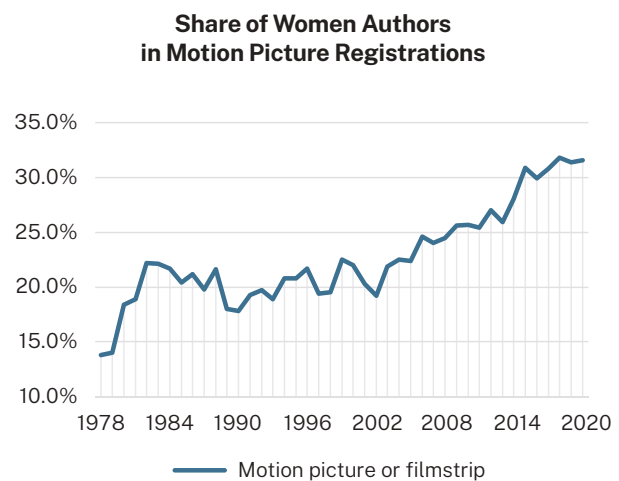


Figure 7 – Share of women authors in *motion picture* copyright registrations from 1978 to 2020.

33 From 1978 to 1983, just over 400 choreographic works were registered, a volume much smaller than the thousands of works registered during that same time span in categories later absorbed into *artworks*.

34 *Sound recordings* as a Copyright Office organizational category consists of works covering only the recording and not any underlying works.

pictures or filmstrips was expanded to include registrations where both the *cinematography and music* or the *cinematography and choreography* were claimed.³⁵ Despite the reclassification of some choreographic works (a category previously exhibiting high rates of female authorship but generally low volume of works) to *motion pictures*, *motion picture* registrations experienced a slight decrease in the share of women authors from 1982 to 1984.³⁶ From 2002 onward, however, the share of women authors in *motion picture* registrations has generally increased, rising to 31.6 percent in 2020.

Machine-Readable Works or Computer Programs

Registrations for the period from 1978 to 2020 reveal that only about 13 percent of *machine-readable work or computer program*³⁷ registrations listed female authors. While this is among the lowest shares of the categories analyzed, it is also a category where registration rates by women authors have demonstrated some of the greatest growth. In 1978, approximately 7.5 percent of *machine-readable work or computer program* registrations listed female authors. From 1978 to 1995, the percentage of registrations with women authors generally rose but was never more than

13.1 percent.³⁸ In 1996, registration rates began to accelerate, and by 2019, the percentage of women authors of *machine-readable work or computer program* registrations hit 26.1 percent, before dropping to 20.4 percent in 2020.³⁹ This sudden drop in registrations is notable, and while external factors may have played a role, further research is warranted.⁴⁰

**Share of Women Authors
in Machine-Readable Work
or Computer Program Registrations**

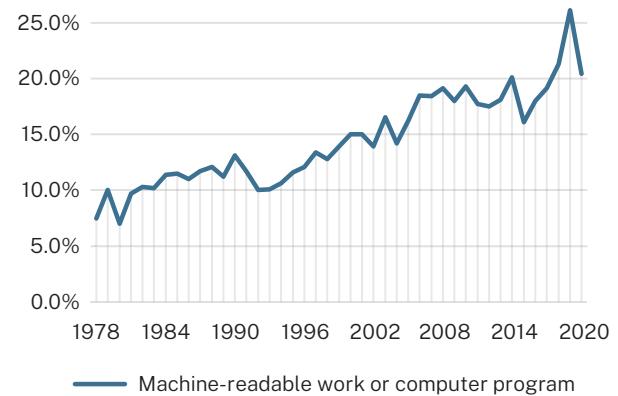


Figure 8 – Share of women authors in *machine-readable work or computer program* registrations from 1978 to 2020.

35 The Copyright Office organizational categories of *motion picture* or *filmstrip* comprise claims based on motion pictures, photoplays, and filmstrips as well as claims on both the *cinematography and music* or the *cinematography and choreography*.

36 In 1982, the share of women authors listed in *motion picture* registrations stood at 22.2 percent, then dropped slightly to 22.1 percent in 1983 and to 21.7 percent in 1984.

37 The Copyright Office organizational categories of *machine-readable works or computer programs* comprise computer programs, printouts, digitally encoded magnetic tapes, punch cards, and (after 1983) video games, although most video games are currently registered as audiovisual works or motion pictures.

38 While considerations relating to works made for hire may impact this rate, compare footnote 14, as Figure 9 shows, the underrepresentation of women in *machine-readable work or computer program* registrations relative to their occupation participation is improving.

39 As noted in footnote 17, prior to 2014, the Office accepted computer programs as either a “computer program” or “text” literary work, and thus some computer programs were categorized under *nondramatic literary works*.

40 The 2020 drop notably coincides with the COVID-19 pandemic, and the impact of the pandemic on women is an area of active academic research. A recent study examining publication rates by women in STEM fields found that while there was no overall drop in female authors across different disciplines due to the pandemic, there were significant differences in publication rates within different disciplines. For example, women in the fields of dentistry and geography exhibited increased publication rates, whereas those in the fields of psychology and mathematics had decreased publication rates. Publication rates of computer science articles by women authors in 2021 increased over 2019 rates but decreased from 2020 rates. See Dariusz Jemielniak, Agnieszka Slawska, and Maciej Wilamowski, “COVID-19 effect on the gender gap in academic publishing,” *Journal of Information Science* (February 11, 2022): <https://journals.sagepub.com/doi/10.1177/01655515211068168>. While publication rates of academic articles and registration rates of *machine-readable works or computer programs* do not necessarily correlate, the potential differential impact of the pandemic on women authors cannot be ruled out as a factor in the proportional drop in registration rates. In March 2020, the Office also increased registration fees, and price sensitivities of women authors may play an additional role. See footnote 30.

Gender Diversity in Copyright-Related Creative Occupations

The data above show that women account for varying percentages of authors across different categories of registered works. For most categories, women still account for substantially less than half. The extent to which women authors are underrepresented in their use of the copyright registration system may be evaluated by comparing this data to the level of women's participation in related creative occupations.

The results show that some of the variation across copyright categories does reflect differential occupational participation by gender. But it is notable that women authors' registration rates are substantially lower than their corresponding occupational participation, suggesting a further gender disparity in the use of the copyright system. While the evidence is consistent with gender disparity in registrations, the occupational data indicate the number of persons reporting working in each occupation, but not the hours they devote to the activity or their role within that occupation. Possible gender differences in hours worked, or the tendency to identify with an occupation, could distort the measured gender gap.

Comparison of Occupation and Registration Participation Rates

The BLS reports annual data on women's share of individuals employed in many relevant occupations. Data on participation in copyright-related occupations from 2003 to 2020 show that men account for greater shares of architects, musicians, producers, directors, and programmers than their share of the labor force generally.⁴¹ Conversely, women account for greater shares of artists and writers.⁴²

To examine potential relationships between registration and occupation participation, BLS categories were paired with copyright registration categories as follows: architect - *architectural drawing, architectural model*; artist and related workers - *art reproduction, artwork*; computer programmers - *machine-readable work or computer program*; musicians, singers, and related workers - *sound recording, musical work, sound recording and music*; producers and directors - *motion picture or filmstrip*; and writers and authors - *nondramatic text*.

As shown in Figure 9, for the period from 2003 to 2020, the occupations with higher shares of women participants also had higher shares of registrations by women authors; the correlation between the two is 0.9035, which is statistically significant.⁴³ This strong concordance indicates that registration records provide a reasonable measure of the proportional share of creative activity undertaken by women, despite the voluntary nature of copyright registration.

41 The USPTO SUCCESS Act Report similarly cited research finding that women are underrepresented in patent-intensive disciplines, as well as in patent-intensive job tasks including development and design. USPTO SUCCESS Act Report, citing Lisa D. Cook and Chaleampong Kongcharoen, "The Idea Gap in Pink and Black" (National Bureau of Economic Research working paper no. 16331, September 2010).

42 About 48 percent of the American workforce comprises of women. Occupational participation rates averaged from 2003 to 2020 demonstrate that women comprised just over 50 percent of persons reporting their occupation as artist and over 57 percent of persons reporting their occupation as writer.

43 Joel Waldfogel, "Women and the Creation of Copyright Protected Content" (unpublished working paper).

Women's Occupation Participation Rates vs. Copyright Registration Rates

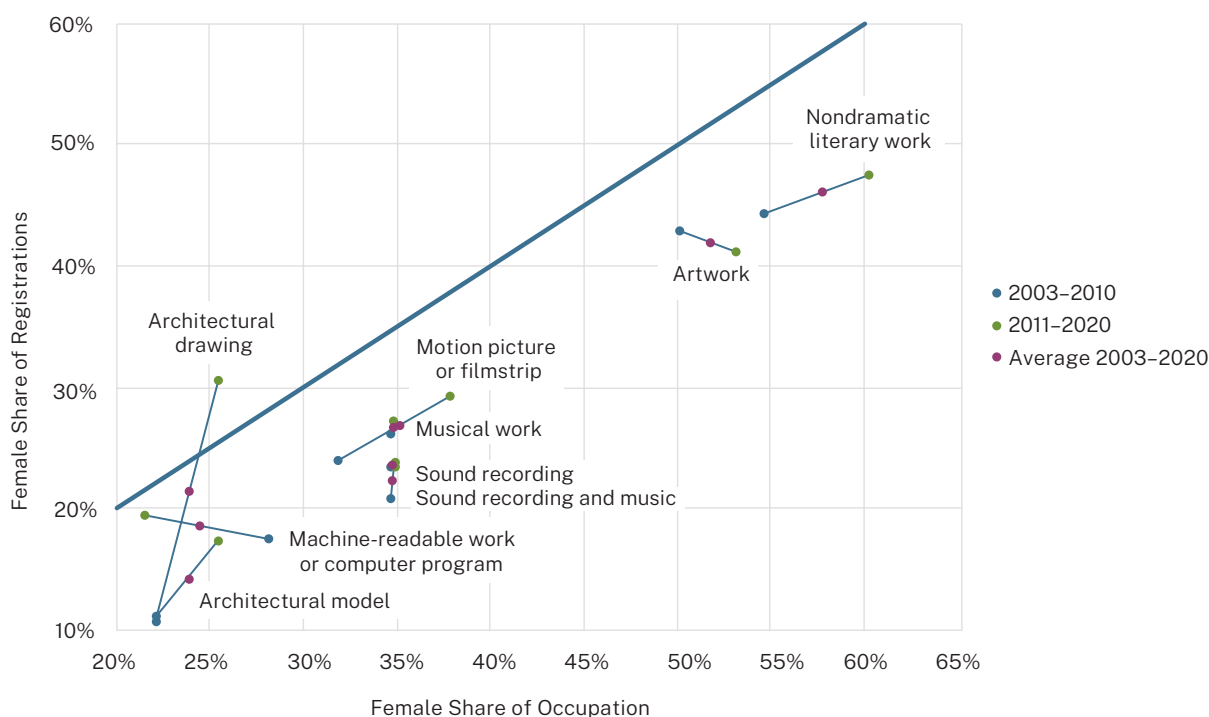


Figure 9 – The blue line represents the expected registration rate by women authors if gender representation rates were equal in occupation data and registration data.

Nevertheless, there is a clear divergence between women's registration authorship shares and occupational participation shares. Across nearly every category, women make up a substantially smaller proportion of authors in copyright registrations than they do of occupational participants.⁴⁴ Figure 9 plots the share of women authors in copyright registration categories against their occupational participation rate.

The dark blue line details the expected rate of copyright registrations by women authors if registration rates and occupational participation rates were equal. As shown in Figure 9, women's authorship rates in registration trail occupational participation in nearly every category of work, although the magnitude of the gap varies among categories.⁴⁵

⁴⁴ The gap is smaller, however, than for women inventors' patenting rates compared to corresponding occupations. The USPTO's Progress and Potential Report found that "[a]cross nearly all science occupations, women participate at a much higher rate than they invent patented technology." See Figure 2, *Women Patent Inventors vs. Women in Science and Engineering Occupations*. USPTO Progress and Potential Report, 5.

⁴⁵ The category of *sound recording and nondramatic textual work* presents a challenge for comparison. The category may include a diverse body of works such as audiobooks or lyrics. When the registration data are compared to the occupational category of musicians, singers, and other related workers, women were 10.3 percent more prevalent among the registration authors than their occupational participation, one of the few examples of overrepresentation. When compared against the occupational category of writers, however, women are approximately 31 percent less prevalent.

The average ratio of the registration share to occupational share is 0.784, meaning that from 2003 to 2020, women were 21.6 percent less prevalent among registration authors than among participants in the associated occupations.⁴⁶ However, this gap is generally closing. From 2003 to 2010, women were roughly 27.5 percent less prevalent in registration records than they were in the corresponding occupational data, but for 2011 to 2020, the gap had shrunk to 14.5 percent.

Literary Works

Between 2003 and 2020, women represented 57.5 percent of self-reported writers and authors in the BLS occupational data but only about 46 percent of the authors named in *nondramatic literary work* registrations. In other words, across this eighteen-year span, women authors, on average, were approximately 20 percent less prevalent among the relevant copyright registrations than among those who occupationally identified as writers. However, as Figure 3 shows, women's share of authorship in *nondramatic literary works* registrations rose to parity with men over this time.

Performing Arts

Music industry and copyright registration data demonstrate similar but more complex relationships. Performing arts works often involve creative contributions of numerous individuals, each of whom may have intellectual property rights.

Acknowledging this challenge, the BLS category of musicians, singers, and related workers, which includes the subcategories *musicians and singers* and *music directors and composers*, was selected as presenting the closest match to the copyright categories associated with music and sound recordings, as well as having sufficient records over a continuous time period. From 2003 to 2020, women accounted for about one-third of musicians, singers, and related workers.⁴⁷

Likewise, music-related works fall into a variety of copyright registration categories. Registration rates of music-related works by women authors in relation to the share of women musicians, singers, and related workers can vary significantly. Women represent just under 30 percent of all music-related copyright registrations. For *sound recordings*, women authors were listed in 23.4 percent of registrations, compared with an occupational participant rate of 34.7 percent, meaning they are 32.6 percent less prevalent in registrations than their occupational participation. For *musical works*, women authors were listed in 26.6 percent of registrations with an occupational participant rate of 34.7 percent, meaning they were 23.3 percent less prevalent. Comparing the 2000s and 2010s, the gap between women's share of copyright registrations in the categories of both *musical works* and *sound recordings* and their occupational participation remained consistent, but the gap between women's authorship in *sound recording and music* registrations and occupational participation decreased from 39.9 percent for 2003 to 2010 to 31.9 percent for 2011 to 2020.

46 For illustration, suppose women made up 50 percent of an occupation but only 40 percent of the authors in a corresponding registration category. Although this would differ by 10 percentage points, this 40 percent registration rate would be 20 percent below the 50 percent occupational participation rate (20 percent = $1 - 40/50$), meaning that women would be 20 percent less prevalent among authors in registrations than in the corresponding occupation.

47 Occupational Employment and Wages, May 2021 Occupation Profiles, U.S. Bureau of Labor Statistics, https://www.bls.gov/oes/current/oes_stru.htm#27-0000.

Motion Pictures

Based on the BLS data, women account for nearly 22 percent of directors, 31 percent of writers, and 35 percent of producers.⁴⁸ While there is variation in women's participation rates in motion picture-related professions, when these rates are averaged across the years 2003–2020, women authors were approximately 23.5 percent less prevalent among copyright registrations for *motion pictures or filmstrips* than in occupational roles within the film industry. This gap has been relatively static, at 24.9 percent for the time span from 2003 to 2010 and shrinking to 22.5 percent for 2011 to 2020.

Artworks

Between 2003 and 2020, women represented 51 percent of self-reported artists and related art workers in the BLS dataset but only about 42 percent of the authors named in *artwork* registrations. Thus women authors were approximately 19.2 percent less prevalent among the relevant copyright registrations than among those who occupationally identified as artists. Comparing the two decades, this gap has widened from 14.3 percent to 22.5 percent and presents an area for further attention.

Science and Technology

Women make up nearly 27 percent of employees in science, technology, engineering, and math (STEM) fields, according to the Census Bureau.⁴⁹ While many different professionals write computer programs and machine-readable works, including software developers and database administrators and architects, video game designers, and others,⁵⁰ the occupational category of computer programmer was chosen as a reference point given its close connection to the copyright work category.

From 2003 to 2020, women represented approximately 23 percent of computer programmers. During this time, women represented about 18 percent of authors in *machine-readable work or computer program* registrations. These registration rates, examined in conjunction with occupational participation rates for computer programmers, reveal that women are approximately 22 percent less prevalent among the listed authors in copyright registrations for *machine-readable works or computer programs* than they are in the corresponding profession. This figure is similar to differences between registration and occupation participation among other creative categories. As detailed above, however, the proportion of women authors listed in registrations of *machine-readable works or computer programs* has substantially increased since 1978, and for 2011 to 2020, the gap between women authors' share of registrants compared to their occupational participation shrank to 9.8 percent.⁵¹

48 Joel Waldfogel, "Women and the Creation of Copyright Protected Content" (unpublished working paper).

49 STEM and STEM-related fields include computer sciences, mathematics, engineering, live sciences, physical sciences, social sciences, architecture, health care, and technical practitioners. Anthony Marinex and Cheridin Christnacht, "Women Are Nearly Half of U.S. Workforce but Only 27% of STEM Workers," United States Census Bureau, January 26, 2021, <https://www.census.gov/library/stories/2021/01/women-making-gains-in-stem-occupations-but-still-underrepresented.html>.

50 While not all STEM occupations map neatly onto copyright registration categories, women represent approximately 21.1 percent of programmers, 19.4 percent of software developers, and 28.8 percent of database administrators and architects. U.S. Bureau of Labor Statistics, "Share of minority group computer occupation workers in the U.S. 2020," Statista, May 5, 2021, <https://www.statista.com/statistics/311935/us-minority-computer-workers/>.

51 The finding of dual layers of underrepresentation, particularly in STEM-related categories of works, parallels USPTO research showing underrepresentation of women in the science and engineering workforce and an inventor rate below women's share of those jobs. USPTO Progress and Potential Report, 5–6.

Conclusion

Analysis of registration data reveals a complex and evolving picture of women in the creative professions and their use of the copyright registration system. While women are less well-represented among registered authors than men, this rate varies among different types of creative works. Their highest representation is in the area of *nondramatic literary works*, where in 2020 women authors were listed in 51.2 percent of registrations. Their lowest representation in a major category is in *machine readable works or computer programs* (although representation by women authors was lowest in the much smaller category of *architectural drawings*).⁵²

At the same time, the rate of change is impressive. It is clear that women authors are actively participating in the registration system, and at an increasing rate. In 2020, over 38 percent of all copyright registrations were granted to women authors, as compared to 28 percent in 1978. Since 1978, the proportional share of women authors in *motion picture or filmstrip* registrations has more than doubled, and it has nearly tripled in registrations of *machine-readable works or computer programs*. Other categories of works, such as those related to music, demonstrate moderate but sustained growth in the proportional share of women authors.

In a broader economic context, women authors' registration rates have a positive concordance with participation rates in corresponding creative occupations, and therefore provide a

reasonable measure of their share of creative activity despite the voluntary nature of registration. When registration rates are compared to occupational participation rates for the period from 2003 to 2020, women authors are listed in registrations at an average rate of 21.6 percent lower than their share of related occupations. This gap is shrinking, however, and averaged 14.5 percent from 2011 to 2020. Together these data paint a picture of two levels of underrepresentation of women within the copyright ecosystem: first, women are underrepresented in many but not all copyright-related occupations relative to their proportional share of the broader workforce, and second, they are underrepresented in most categories of copyright registrations relative to their measured participation in the corresponding occupations.

The positive concordance between occupational participation and registration suggests that increasing women's representation in copyright related occupations would increase copyright registration in related categories. Moreover, since in nearly all copyright registration categories women authors register works at a lower proportional rate than their occupational share, there is room to empower more women to take advantage of the system's benefits. Even for categories such as *artworks*, where women are already well represented in related occupations, enhanced outreach and education could aid in reaching gender parity.

52 The internal category of *architectural drawings* was created in 1983, and since then just under 32,000 drawings have been registered.

OVERVIEW

This research explores the participation of women in the copyright system by providing key metrics on women authors in copyright registrations, and evaluating registration rates in the broader context of women in copyright related occupations. A combination of copyright registration records and publically available records was analyzed to explore these relationships.

KEY FINDINGS

The share of copyright registrations overall accounted for by women has risen over time, and women make up over 38.5 percent of authors of works registered in 2020.

- In 1978, the effective year of the current Copyright Act, women represented only 27.9 percent of authors in registered works. By 2012, this number rose to about 36 percent, and as of 2020, women represent 38.5 percent of sole authors in copyright registrations.

Women's proportional share of registrations differs across copyright categories but has risen over time in almost all categories and in some categories achieved gender parity.

- Women authors are present in roughly 50 percent of copyright registrations for *nondramatic literary works*. The proportional share of women authors for motion pictures has more than doubled since 1978, and in that same time, the proportional share of *machine-readable works or computer programs* by women authors has nearly tripled.
- Women's proportional share of authorship in performing arts-related registration categories demonstrates moderate but sustained growth, with women authors present in 20 to 30 percent of registered works.
- Registrations of *artworks* reached near gender parity in the mid-1990s, but the share of copyright registrations of *artworks* by women authors dropped to the low 40 percent range in the early 2000s and has remained relatively consistent.

Occupations with higher shares of women participants have higher shares of copyright registration by women authors.

- There is a strong concordance between women's participation rates in copyright-related occupations and their proportional share of copyright registrations in related categories. This indicates that copyright registration data is likely a good proportional measure of women's involvement in creative activity.

Across nearly every category, women make up a smaller share of copyright authors than they do occupational participants.

- Data from 2013 to 2020 showed that on average women were 21.6 percent less prevalent among copyright registrations than among persons in the associated copyright-related occupations.
- The gap between women's authorship rates and occupational participation rates is smaller than the gap between women patentees and their participation rates in related STEM professions.
- From 2003 to 2010, women were roughly 27.5 percent less prevalent in registration records than they were in the corresponding occupations, but from 2011 to 2020, the gap shrunk to 14.5 percent.



Women in the Copyright System

An Analysis of Women Authors in Copyright Registrations from 1978 to 2020

A special report by the United States Copyright Office



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