



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

Economic History Student Working Papers

No: 041

North American Female Suffrage: the role of occupational dispersion in the West

Gayatri Sajayan

*Submitted as partial fulfilment of the BSc in
Economics and Economic History 2023-24*

February 2025

North American Female Suffrage: the role of occupational dispersion in the West

Gayatri Sajayan

Abstract:

Until the passing of the 19th Amendment in 1919, voting rights for women in the US were not mandatory. Accordingly, many states refused women this privilege. However, the West appeared to be an exception, with all but one state in this region having granted female suffrage before federal enforcement. This paper seeks to understand the role of regional trends in female labour force participation in women's enfranchisement, with a focus on the impact of occupational dispersion between 1880 - 1910. By exploring an avenue outside of religion and gender imbalances, an original contribution to existing literature on the success of Western women's suffrage is provided. I utilise census data and governmental marital status statistics to conduct graphical analysis using cartography and complementary log-logistic regression analysis. The key finding of the paper is that women in Western states tended to be engaged in a narrow range of jobs – a consistent pattern found over the period of study. This helped them form a collective voice to fight for emancipation by facilitating mobilisation and more effective suffrage strategies. Hence, although the impact of women's occupational dispersion is not found to be statistically significant, the relationship between the two variables is nevertheless historically meaningful.

1 Introduction

1.1 Female suffrage and the labour force

The women's suffrage movement in the United States followed a unique trajectory compared to the rest of the Western world, with American women being some of the first to be granted voting rights.¹ The ratification of the 19th Amendment by Congress took place in 1920, which legally guaranteed all American women access to the ballot.² However, at this stage, all Western states apart from New Mexico had already awarded women this right within their

¹ Sebastian Braun and Michael Kvasnicka, "Men, women, and the ballot: Gender imbalances and suffrage extensions in the United States," *Explorations in Economic History* Vol. 50 (July 2013): 406. <https://doi.org/10.1016/j.eeh.2013.04.001>

² "19th Amendment to the U.S. Constitution: Women's Right to Vote (1920)," National Archives, last modified February 8, 2022.

territorial elections.³ Wyoming was the first to do so in 1869, closely followed by Utah and Colorado. To many, this trend was a surprising occurrence, as the women's suffrage movement was thought to have exhibited significantly greater strength in the East than in the West. Naturally, this leads us to question why women were given access to the ballot first in states where there had seemingly been less of an active push for this. This paper hypothesises that Western states had lower female dispersion across occupational categories and that this characteristic contributed to their early enfranchisement.

Between 1890 and 1930, national female labour force participation rates are estimated to have increased by 9.5 percentage points for women aged 25 – 44 years old and 7.3 percentage points for married women between 35 – 44 years of age.⁴ During the same period, a rising number of American states were granting women voting rights until the eventual ratification of the 19th Amendment. As female labour force participation reflects changing social perceptions of gender norms and expectations of women, it seems plausible that as the image of women solely as homemakers diminished over time, demands for equal voting rights increased. This paper takes this process a step further and argues that the impact of the *categories* in which women were employed is important to investigate. Despite women in the West having relatively low labour force participation rates, those who were employed were concentrated in specific sectors, as opposed to across a wide range of occupations. This facilitated more effective movements for increased agency by providing a collective voice, allowing women to be enfranchised comparatively early. Although many women still did important work in the home and as mothers in the late nineteenth century, the purpose of this paper focuses on participation in market labour.⁵

³ Karen Campbell and Holly McCammon, "Winning the Vote in the West: The Political Successes of the Women's Suffrage Movements, 1866 – 1919," *Gender and Society Vol. 15* (Feb 2001): 55. <https://www.jstor.org/stable/3081830>

⁴ Claudia Goldin, "The Quiet Revolution That Transformed Women's Employment, Education, and Family," *American Economic Review Vol. 96* (May 2006): 4.

⁵ S.J. Kleinberg, "Women's Employment, 1865 – 1920," in *Women in the United States, 1830 – 1945* (London: Red Globe Press, 1999), 105.

1.2 Research question and structure

Studying women's emancipation, and in particular, their enfranchisement is certainly valuable for two key reasons. Firstly, granting women the right to vote transformed the eligible electorate, which in turn had a significant impact on the political choices of leaders as well as societal outcomes.⁶ Thus, studying the driving factors of their suffrage is inevitably an important point of research in political economy.⁷ Secondly, the enfranchisement of women drastically changed public perceptions of their role in society. Since they were no longer confined to housework and motherly duties, significant changes were witnessed in many areas of society including the home, workplace, and education. As female labour force participation has similar effects on societal outcomes, researching a potential causal relationship between employment trends and voting rights can help us better understand the trajectory of American women's emancipation. Further, by analysing this relationship with a particular emphasis on the West, regional differences in the success of the suffrage movement can be more deeply appreciated. Hence, the narrow question that this paper aims to answer is whether Western women's work was more or less dispersed across different occupational categories, and if so, did this have a causal impact on their early enfranchisement? I use the most widely applied measure of evenness, the Dissimilarity Index, to quantify dispersion levels.⁸ On a broader level, it seeks to understand regional differences in the success of the American suffrage movement.

Firstly, a literature review of current scholarly explanations for the early enfranchisement of Western women will be provided. Following this, the research design alongside the empirical model measuring the impact of occupational dispersion on women's enfranchisement will be outlined. Then, my choice of primary sources will be presented in terms of their uses, strengths, and

⁶ Braun and Kvasnicka, "Men, women, and the ballot," 406.

⁷ Ibid.

⁸ "Housing Patterns: Appendix B: Measures of Residential Segregation," United States Census Bureau, last modified November 21, 2021. <https://www.census.gov/topics/housing/housing-patterns/guidance/appendix-b.html>

limitations. Next, I will carry out thematic cartography to prove my hypothesis that Western states had lower-than-average occupational dispersion. An alternative measure for dispersion (the Herfindahl-Hirschman Index) is also tested in this section as a robustness measure. Finally, I conduct a complementary log-logistic regression analysis from which estimates will be used to quantify the effect of occupational dispersion on the timing of voting rights for Western American women.

2 Literature review

2.1 Historical context: national trends in female labour force participation

Goldin's work has shown that the trend in women's participation in the US during the period of study was U-shaped.⁹ Essentially, it dropped in the 19th century until the 1920s. Only in the 20th century, then, did the trend in women's labour force participation reverse, with the rise of real wages explaining 60 percent of the increase in working women.¹⁰ Their participation continued to consistently increase throughout the 20th century.¹¹ Until the late 19th century, the general view of American women's primary occupation was in the home or unpaid work in family businesses.¹² Working women in this era were often piece workers in manufacturing or employed in the service sector, and increasingly employed as professional workers from the 1910s onwards.¹³ At this junction in history, the social expectations of men and women began to be redefined.¹⁴ As competition with foreign manufacturers grew, young and unmarried women

⁹ Claudia Goldin, "The U-Shaped Female Labor Force Function in Economic Development and Economic History," in *Schultz TP Investment in Women's Human Capital and Economic Development* (Chicago: University of Chicago Press, 1995)

¹⁰ James Smith & Michael Ward, "Time-Series Growth in the Female Labor Force," *Journal of Labour Economics Vol. 3* (Jan 1985): 59. <https://www.jstor.org/stable/2534998>

¹¹ Claudia Olivetti, "The Female Labor Force and Long-run Development: The American Experience in Comparative Perspective," (Boston University and NBER, 2013)

¹² Claudia Goldin, "The U-Shaped Female Labor Force."

Claudia Goldin, "The Quiet Revolution."

Claudia Olivetti, "The Female Labor Force."

¹³ Claudia Goldin, "The Quiet Revolution," 4.

¹⁴ Deborah Warner, "Perfect in Her Place: Women at Work in Industrial America," *Smithsonian Institution* (1981): 1. <https://eric.ed.gov/?id=ED260963>

started to be employed by factories that sought cheap labour.¹⁵ Similarly, other industries such as commerce and entertainment increasingly employed women too.¹⁶

2.2 Historical context: female labour force participation in the West

First of all, as Woodworth-Ney has emphasised, there are differing meanings of the ‘West’ and of what is meant by women in the West as a category.¹⁷ In this paper, the eleven Western states as defined by the Census Bureau (as shown in Figure 1) are assessed and Western women are those who resided in these states. Hawaii is excluded as it did not become an American state until 1959.¹⁸

Figure 1. Year women were enfranchised in the West¹⁹

State	Year women were enfranchised
Wyoming	1869
Utah	1870
Colorado	1893
Idaho	1896
Washington	1910
California	1911
Oregon	1912
Arizona	1912
Montana	1914
Nevada	1914
New Mexico	1920

In an article published by “*Montana The Magazine of Western History*”, Riley provides insight into what the role of women in this region was perceived to be and how the emergence of the market economy impacted them. Examples primarily consisted of Western women taking on a limited range of occupations,

¹⁵ Ibid, 8.

¹⁶ Ibid, 16.

¹⁷ Laura Woodworth-Ney, *Women in the American West* (California: ABC-CLIO, 2008), 15.

¹⁸ Giles Scott-Smith, “From Symbol of division to Cold War Asset: Lyndon Johnson and the Achievement of Hawaiian Statehood in 1959,” *The Journal of the Historical Association* Vol. 89 (Mar 2004).

¹⁹ “19th Amendment By State,” National Park Service, last modified July 22, 2020. <https://www.nps.gov/subjects/womenshistory/19th-amendment-by-state.htm>

overwhelmingly in domestic work, personal services, and textiles.²⁰ The varying interpretations of what effect the emergence of the market economy had on women were also emphasised as an important aspect of the historical context in the West.²¹ On one hand, the market economy increased the number of working women and has been argued to have brought them greater power within the family, leading to the breakdown of traditional gender norms.²² On the other hand, some historians contend that women were still rarely employed in paid work and did not have the “economic resources, political power, military might, and the status” needed to hold power in the social system of this period.²³ By assessing the impact of women’s occupational dispersion on the timing of their access to voting rights, this paper will provide its take on this debate.

It is crucial to bear in mind that, just like in all other regions, the experience of each woman was unique due to differences in education, race, and social class among other factors.²⁴ For instance, working-class white women, immigrant women, and black women were more likely to take on paid employment than middle- and upper-class white women; but they did so out of necessity rather than to protest for equality.²⁵ All of these experiences collectively formed the Western American female employment experience.

2.3 Key waves of study

The American women’s suffrage movement is a well-researched topic of study and has been analysed from many different angles.²⁶ Three main waves of study attempt to explain the early enfranchisement of Western women. Namely, the influence of religion, sex ratios, and gendered opportunities.

²⁰ Glenda Riley, “Western Women’s History – A Look at Some of the Issues,” *Montana The Magazine of Western History* Vol. 41 (Spring 1991): 67. <https://www.jstor.org/stable/4519384>

²¹ Ibid, 66.

²² Ibid.

²³ Ibid.

²⁴ Ibid.

²⁵ Ibid, 69.

²⁶ Sara Anna Egge, “When we get to voting”: Rural women, community, gender, and woman suffrage in the Midwest,” (PhD diss., Iowa State University, 2012): 2.

2.3.1 Religion

To begin with, Grimes provides perhaps the earliest and most detailed explanation for the role of religion. In “*The Puritan Ethic and Woman Suffrage*”, he suggested that native-born men in Western states were responsible for granting women the vote, and did so with the ulterior motive of solving what they saw to be core societal issues.²⁷ Men believed that the earlier women won the vote, the easier it would be for Puritan values (and restriction policies on the likes of gambling and prostitution) to be considered the norm in public life.²⁸ He argued that in Wyoming, for instance, women’s suffrage was harnessed as a tool to “ensure more order and sobriety”, whilst in Utah the Mormon community played a crucial role in pushing for the extension of suffrage to women.²⁹

Years later, Beeton built upon this stance by contending that the proposal to grant women the right to vote in Utah first came about due to concerns from outside the territory relating to polygamy.³⁰ In other words, legislators in Utah became aware of the oppressed image of Mormon women and potential antipolygamy legislation and thus utilised women’s access to the ballot as a tool to shut such concerns down.³¹ The Mormon influence was significant in Idaho too, where the first legislation proposed to grant women’s suffrage was made by the representative of a predominantly Mormon county, and where Mormon women from Utah were disseminating the idea of equal voting rights.³² To substantiate her argument, Beeton utilised the diary entries of various women’s rights activists, transcripts from conferences on women’s suffrage, and newspaper and journal articles. By using a range of qualitative sources to reach her conclusion, the idea of Mormon influence gains stronger credibility. Furthermore, whilst the use of diary entries presents concerns of bias, combining

²⁷ Karen Campbell and Holly McCammon, “Winning the Vote in the West: The Political Successes of the Women’s Suffrage Movements, 1866 – 1919,” *Gender and Society Vol. 15* (Feb 2001): 55. <https://www.jstor.org/stable/3081830>

²⁸ Ibid, 58.

²⁹ Alan Grimes, *The Puritan Ethic and Woman Suffrage* (New York: Oxford University Press, 1967): 1115. <https://doi.org/10.2307/1953418>

³⁰ Beverly Beeton, *Women Vote in the West: The Woman Suffrage Movement, 1869 – 1896* (New York, Garland Publishing, 1986): 27

³¹ Ibid, 37.

³² Ibid, 132.

this with the minutes from official government meetings adds a degree of certainty to the claims being made.

Clark further supports this argument of women being granted the right to vote in the West early due to the religious motives of men. He points out that such religious and moral concerns paved the way for women to participate in many “charitable and benevolent” activities, through which they could extend their agency to include suffrage as a “tool of moral guardianship.”³³ Effectively, by relying on the ‘spirituality’ of women, more arguments for increased female political rights to protect society could be made.³⁴ To address this theme in the literature, this paper explores the impact of divorce rates. As traditional Mormon and Puritan culture rejects divorce, divorce rates can be viewed as an - imperfect - proxy for the importance of religion in a particular state.³⁵ I raise doubts about its significance in the general population for female enfranchisement, despite acknowledging that religion may have been important from the government-level perspective. Furthermore, I contend that since not *all* Western states had a prominent Mormon community nor did they *all* struggle significantly more with social issues than other states, the religious explanation cannot depict the full picture.

2.3.2 *Sex ratio*

This incomplete explanation of early female suffrage in the West thus led to the next crucial wave of study in this area, which is the relevance of varying sex ratios across states in the US. As a consequence of the strongly male-biased settlement of migrants on the Frontier, Western states in general had high male-female sex ratios.³⁶ In 1999, Kenny hypothesised that states with higher sex ratios had lower costs of women’s suffrage for men, and therefore they

³³ Elizabeth Clark, “The Politics of God and the Woman’s Vote: Religion in the American Suffrage Movement, 1848 – 1895,” (PhD diss., Princeton University, 1989): 2.

³⁴ *Ibid.*

³⁵ William Haller and Mallevalle Haller, “The Puritan Art of Love,” *Huntington Library Quarterly* Vol. 5 (Jan 1942).

³⁶ Braun and Kvasnicka, “Men, women, and the ballot,” 406.

enfranchised women earlier.³⁷ Fewer women meant that there was less likelihood of the ‘devaluation’ of the male vote in terms of influence on society.³⁸ Braun and Kvasnicka later tested the significance of male dominance based on this hypothesis and found that gender imbalances indeed ‘reduced the costs and increased the benefits’ of women’s suffrage to the men granting it.³⁹ By using US Decennial Census data to estimate discrete time hazard rate models for states and territories, they concluded that the high male-female ratios were the most significant determinant of geographic disparities in the transition to nationwide women’s suffrage.⁴⁰ My regression analysis will further strengthen this argument on the relationship between the sex ratio and early female enfranchisement. Other state-specific factors that they found to be partially responsible for Western states granting the female vote earlier were women’s employment, urbanity levels, and the proportion of the population that was Mormon.⁴¹ On the other hand, they found a higher proportion of non-whites in the population and a bigger manufacturing sector to have hindered the adoption of women’s suffrage.⁴² My question of how female occupational dispersion impacted regional differences in voting rights fits into this debate about the role of women’s employment – and by focusing on this aspect instead of the sex ratio, it provides a unique perspective. Furthermore, as I explore the impact of the percentage of foreign-born individuals in my regression analysis, a new angle on the role of ethnicity and nationality will be studied.

However, their results have been critiqued as being too narrow. Kirby, for instance, contends that their results are largely affected by the outlier states, and drivers other than the sex ratio are emphasised when more effective controls are used.⁴³ Furthermore, although they control for broad historical trends in

³⁷ Lawrence Kenny, “Explaining the puzzle of why men gave women the right to vote,” University of Florida Working Paper (1999).

³⁸ *Ibid.*

³⁹ Braun and Kvasnicka, “Men, women, and the ballot,” 406.

⁴⁰ *Ibid.*

⁴¹ *Ibid.*, 413.

⁴² *Ibid.*, 418.

⁴³ Timothy Joel Kirby, “Women’s Suffrage in the United States: A Synthesis of the Contributing Factors in Suffrage Extension,” (MA Diss., Miami University, 2020), 17.

their analysis, they take little consideration of more intricate regional differences. For instance, variation in suffragist strategies or other local movements may have impacted a state's likelihood of granting the female ballot. As I exclude states from my analysis that I believe have insufficient data quality, this issue of external factors affecting the results is minimised. I also use qualitative evidence to mitigate concerns about the effects of wider historical trends.

2.3.3 Gendered opportunities

This leads us to the final key wave of study, which is exemplified by Campbell and McCammon. They disagree with the significance of the sex ratio and instead, hypothesise that a 'combination of agency and structure' was what allowed for gendered opportunities and the early enfranchisement of women.⁴⁴ Their work firstly emphasises that Western suffragists gained support by using more effective strategies than their counterparts. Western movements tended to be quieter and promoted less to the general public, which likely helped them avoid large-scale opposition to the cause.⁴⁵ They were also more likely to make use of expediency arguments, which were those that utilised possession of traditionally feminine qualities as justification for how they could 'improve public life' – similar to the harnessing of 'female spirituality' in the religious argument.⁴⁶ In this way, Western movements managed to appease potential male concerns about what women's suffrage would entail for the maintenance of traditional gender roles.

Secondly, they discuss the importance of gendered opportunity structures. In the 19th century, expectations of women and men were rigidly in the spheres of child-rearing/domestic work and politics/ business respectively.⁴⁷ Women's lack of formal authority in society, then, could be drawn down to the gender division of

⁴⁴ Campbell and McCammon, "Winning the Vote in the West," 77.

⁴⁵ Ibid, 61.

⁴⁶ Ibid, 58.

⁴⁷ Barbara Welter, "The Cult of True Womanhood: 1820: 1860," *American Quarterly Vol. 18* (1966).

labour between women's domestic work and men's public occupations.⁴⁸ However, the emergence of the "new woman" allowed women to remain in education for longer, seek employment, and divorce among many other liberations.⁴⁹ They contend that this transformation of gender relations changed the perceptions of political leaders on the role of women, and this provided a gendered opportunity by making them more willing to support female voting rights.⁵⁰ Nevertheless, a largely segmented workforce persisted in this period. Jameson and Armitage conclude in their study of the agrarian industry in Colorado that although it was much more common for females to go beyond gender-defined work than males from the end of the 19th century, women's work was still largely complementary and assistive to that of their husbands' lives and work.⁵¹

This paper aims to contribute to the final key wave of study, as the level of dispersion in women's work is related to gendered opportunities in a state. It furthers the narrative that although some Western women may have broken traditional gender norms, for the large part they were subject to rigid gendered occupational segregation. Currently, although the US suffrage movement is widely studied, literature often focuses on the political aspect of the movement. In the sphere of North American women's history, there is still limited research on the driving factors of regional differences in the success of the women's suffrage movement, particularly from an occupational perspective. By testing the significance of factors other than the widely attributed high sex ratios and dominance of Mormonism on a state-by-state basis, this project provides an original perspective to the literature.

⁴⁸ Michelle Zimbalist Rosaldo & Louise Lamphere, *Woman, Culture, and Society: A Theoret Overview* (California: Stanford University Press, 1974): 17 – 42.

⁴⁹ Holly McCammon, Karen Campbell, Ellen Granberg & Christine Mowery, "How Movements Win: Gendered Opportunity Structures and U.S. Women's Suffrage Movements, 1866 to 1919," *American Sociological Review Vol. 66* (Feb 2001): 51.

<https://doi.org/10.1177/000312240106600104>

⁵⁰ Ibid.

⁵¹ Susan Armitage & Elizabeth Jameson, *The Women's West* (Oklahoma: University of Oklahoma Press, 1987), 167.

3 Research design

3.1 Data

To analyse the significance of the dispersion of women’s work in granting access to the ballot, I constructed a panel dataset containing information on each of the 46 states analysed in this project across 1880 – 1910. Alaska, Nebraska, Dakota, and Oklahoma are excluded from the analysis. Alaska and Nebraska are excluded as census enumerators could not collect accurate counts until 1900, and Dakota is omitted as during the specified period there were changes in its classification into North and South Dakota.⁵² Finally, Oklahoma is not included as it only became a state in 1907 – nearing the end of my analysis period.⁵³ The information included in the dataset is the following for each state by decade: the Dissimilarity Index (DI) scores, sex ratio, divorce rate, the percentage of foreign-born residents, and a binary variable for the year women were enfranchised in the state. This binary variable equated to zero if women were granted voting rights in 1919 or afterwards and equated to one if this occurred before 1919. 1919 was chosen as this is the year the 19th Amendment was passed.

The analysis in this paper focuses on explaining the hazard rate of granting women voting rights before 1919, with the main explanatory variable of interest in this model being how evenly spread women and men were across different occupational categories. As a measure of dispersion, the Dissimilarity Index (DI) is utilised. The DI is used to measure the evenness with which two mutually exclusive groups are distributed across geographic units.⁵⁴ In this case, a DI score of 1 would indicate complete separation (men and women are employed in completely different sectors), and a score of 0 would indicate no dissimilarity (men and women are employed evenly across all sectors). The DI score is

⁵² “Alaska Census,” FamilySearch, last modified November 10, 2023, https://www.familysearch.org/en/wiki/Alaska_Census#:~:text=Alaska%20was%20purchased%20by%20the,counts%20until%20the%201900%20census.

⁵³ “Oklahoma Statehood, November 16, 1907,” The Center for Legislative Archives, last modified March 1, 2024, <https://www.archives.gov/legislative/features/oklahoma#:~:text=On%20September%2017%2C%201907%20the,as%20the%20forty%2Dsixth%20state.>

⁵⁴ Rodney Green, “The Dissimilarity Index: A Tutorial,” Howard University, accessed March 2, 2024, [The Dissimilarity Index: A Tutorial | Howard University COAS Centers.](#)

especially effective at reflecting occupational segregation by gender, facilitating the recognition of disparities in access to certain kinds of jobs. To calculate this score, the proportion of men and women respectively working in four broad categories (Agriculture, Professional and Personal Services, Trade and Transportation, and Manufactures, Mining, and Mechanical Industries⁵⁵) is extracted from census data. Following this, the absolute difference between the proportions of each gender in each category is calculated. Finally, the absolute differences are summed up and divided by two to find the DI score of the state. Although DI scores are usually on a scale of 0 to 1, I have scaled the scores from 0 to 100 to ease the interpretation of the regression coefficients.

Both the sex ratio and percentage of foreign-born residents' variable were also created using census data. For the sex ratio, the total number of men in a state was divided by the total number of women, and to calculate the percentage of foreign-born residents, I divided the number of foreign-born residents by the total population of the state. Next, to construct the binary year variable, I used information from the National Park Service to uncover which states granted female voting rights before 1919.⁵⁶ Finally, to assemble the divorce rates variable, I utilised a governmental source from the National Center for Health Statistics that provided divorce rates per sample of 1000. I standardised all three non-binary variables to a scale of 0 to 100 to facilitate comparability.

3.2 Descriptive statistics

To offer background into the characteristics of different regions in the U.S. and contextualise the results that will follow from the graphical analysis, summary statistics are first provided. Table 1 displays descriptive statistics comparing the

⁵⁵ Those working in the agricultural sector included the likes of agricultural labourers, gardeners, and farmers. Professional and personal services included clerks, dentists, lawyers, nurses etc. Trade and transportation included agents, bankers, and brokers. Finally, manufacturing included bag makers, blacksmiths, and carpenters amongst others. Full lists of jobs associated with each sector can be found in the Decennial Censuses.

⁵⁶ "19th Amendment by State," National Park Service, last modified July 22, 2020. <https://www.nps.gov/subjects/womenshistory/19th-amendment-by-state.htm>

four regions of the US – the West, Midwest, Northeast, and South. A full list of which states are classified in each group is available in the appendix.

Table 1. Descriptive statistics

Variable	West	Midwest	Northeast	South
Dissimilarity %	0.45	0.50	0.35	0.33
Female labour force %	12.30	13.08	21.46	22.93
Sex ratio %	151.87	106.65	99.53	101.41
Foreign-born %	22.49	17.03	21.62	3.25
Divorce rate %	10.61	7.26	5.59	4.62

Note: these statistics are calculated using my original dataset that compiles Decennial Census information and information from “100 Years and Marriage and Divorce Statistics” from the National Center for Health Statistics.

It shows that across 1880 – 1910, the West and Midwest had the highest DI scores, and the Northeast and South lagged far behind. The West has, on average, a DI score of 10 units greater than the Northeast and 12 units greater than the South. This implies that the West had greater gendered rigidities across occupational categories, which is in line with the wider literature suggesting that the region was not exempt from the gender structures of the late nineteenth to twentieth-century US. Such comparisons alone warrant the need for research into the impact of the DI score, especially when considering that the West comprises less than $\frac{1}{4}$ of the states studied. Table 1 also confirms the notion put forth by the likes of Braun and Kvasnicka that the male-female sex ratio and percentage of foreign-born residents are notably higher in the West, as these states possess the highest averages for both variables. In the West, there were approximately 152 men for every 100 women, as opposed to 107 in the Midwest, 101 in the South, and 100 in the Northeast. The percentage of foreign-born residents is roughly 22% in the West, narrowly exceeding the Northeast and overwhelmingly surpassing the South at 3%. Interestingly, the Western states also had the highest average divorce rate in the US. Analysis conducted by Wright in the late 1880s lends further support to this claim, as she found that

Utah and Wyoming had the two highest rates of divorce in the nation in 1870.⁵⁷ This is especially intriguing considering the widespread religious arguments that have thus far been used to explain the West's early enfranchisement of women, as traditional religious culture has long rejected divorce.

Although Table 1 shows the Midwest to have a slightly higher average than the West, the exclusion of several Midwestern states from this paper's analysis (North Dakota, South Dakota, and Nebraska) due to a lack of accurate data and changing territorial status likely contributed to this. It is also important to note that the Midwestern states of Kansas and Illinois were exceptions in their region and granted women voting rights relatively early, in 1912 and 1913 respectively. Thus, a higher DI value in the Midwest does not necessarily discredit the impact of the score on when a state enfranchised women.

Thus, the descriptive statistics appear to confirm what is known about regional differences in the sex ratios and proportion of foreign-born residents. To an extent, they weaken the religious argument and suggest that Western women may have had greater agency in their personal lives. Most importantly, they show that the West had higher-than-average DI scores, suggesting that Western women were involved in a smaller range of occupations than elsewhere. This forms the basis for the analysis uncovering whether this characteristic held explanatory power in why these states tended to grant women voting rights first.

3.3 Model

To analyse the significance of the dispersion of women's work in granting access to the ballot, a suitable model must be utilised. I adapt Braun and Kvasnicka's discrete time duration model and estimate this through the following complementary log-logistic regression function:

⁵⁷ Carroll Wright, *A Report on Marriage and Divorce in the United States, 1867 – 1886: including an appendix relating to marriage and divorce in certain countries in Europe* (Washington: United States Bureau of Labour, 1891).

$$hit = 1 - \exp[-\exp(\alpha t + \beta'Xit)],$$

$$t = 1880 - 1889, 1890 - 1899, \text{ and } 1900 - 1909$$

$$\bullet \longrightarrow \log[-\log(1-hit)] = \alpha t + \beta'Xit$$

In this function, *hit* signals the conditional hazard rate of a state ‘i’ adopting women’s suffrage in decade *t*, assuming that suffrage has not yet been granted in the previous decades.⁵⁸ β denotes how each predictor variable in *Xit* contributes to the overall model estimate. αt denotes the baseline hazard and *Xit* are the control variables that are measured at the beginning of decade *t*.⁵⁹ Moreover, wider historical trends that affected the likelihood of women’s suffrage adoption are empirically captured by αt .⁶⁰ For instance, the rising egalitarianism of The Progressive Era inevitably had an impact on social expectations of women, thus impacting public opinions of their right to vote. Therefore, period dummies for 1880 – 1889 and 1890 – 1899 are included in the baseline regressions to account for this, and 1900 – 1909 is used as the reference period.⁶¹ The complementary log-logistic regression function is chosen over a simple logistic regression model because the resulting estimates do not change depending on the length of the time interval.⁶²

The covariates incorporated in my regressions are:

- (i) Percentage of foreign-born individuals in a state: A range of studies have suggested that a higher proportion of foreign-born residents in a state resulted in more opposition to female suffrage. For instance, McDonagh and Price find that resistance to suffrage was most prevalent in German and Irish communities.⁶³ Thus, the percentage of foreign-born individuals

⁵⁸ Braun and Kvasnicka, “Men, women, and the ballot,” 413.

⁵⁹ *Ibid.*, 414.

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

⁶² *Ibid.*, 413.

⁶³ Eileen McDonagh & H. Price, “Woman Suffrage in the Progressive Era: Patterns of Opposition and Support in Referenda Voting, 1910 – 1918,” *American Political Science Review* Vol. 79 (June 1985): 1. <https://doi.org/10.2307/1956657>

residing in a state has been included as a covariate to account for the potential influence they exerted.

- (ii) Divorce rates: Divorce rates reflect social perceptions of women and their autonomy. Thus, higher rates in a state may stipulate greater support for women's suffrage. Furthermore, high rates in a state could indicate the weaker foothold that religion had in that particular society.
- (iii) Sex ratio: As Braun and Kvasnicka established in their results, high male-female ratios are an important explanatory power in the early enfranchisement of Western women, as they lowered the cost of granting female voting rights.⁶⁴ This variable is included to confirm the strength of this mechanism.

To begin with, a complementary log-logistic regression Model A that only includes dispersion and period dummies as covariates will be estimated.⁶⁵ Following this, increasing sets of covariates will be added to the baseline regression.⁶⁶ Model B adds the percentage of foreign-born individuals and Model C adds the divorce rates. Finally, Model D incorporates the sex ratio. A key concern that is presented by the use of this method is if reverse causality is present in this model. Thus, this will be tested for as a robustness check.

4 Primary source discussion

4.1 Decennial Census records

To conduct comparative regional analyses, comprehensive primary sources must be used to assemble the dataset. The first and main sources that have been used in this project are the *Decennial United States Census Bureau* records for the years 1880 – 1910.⁶⁷ US Censuses were conducted by the government every 10 years to help them decide how to distribute funds and assistance to states and

⁶⁴ Braun and Kvasnicka, "Men, women, and the ballot," 406.

⁶⁵ Ibid, 418.

⁶⁶ Ibid.

⁶⁷ U.S. Census Bureau. Tenth to Thirteenth Census of the United States, 1880 – 1910. Washington, D.C.: U.S. Government Printing Office.

localities and were published 72 years afterwards.⁶⁸ Census records that survived from the late nineteenth and twentieth century were microfilmed, stored by state archives, and published online in the National Archives.⁶⁹ The censuses provide information on the likes of population, mortality, and social statistics.

The primary use of this source in this project has been to construct the DI scores, sex ratio, and proportion of foreign-born residents' columns of the panel dataset. For all three variables, the Statistics of the Population volume in each decennial census were utilised. To calculate the DI scores, the enumerations of employees in each of the four sectors by state were used. For the sex ratio, the tabulations of the population of each state by sex were employed. Finally, to compute the proportion of foreign-born residents, the place of birth statistics found in the population records were used. Until 1870, the census records were still being collected by US Marshals and assistants, who would personally contact individuals living in an area.⁷⁰ They would make up their own forms, tabulate the figures, and then hand the results to the Secretary of State.⁷¹ Thus, to avoid observer bias and measurement error, the analysis of occupational data conducted in this paper began in 1880.

Census records present two key advantages as a source of primary data. Firstly, they are the most consistent source of national data. Every state needed to participate, thus ensuring that the reporting of data was relatively consistent geographically over the chosen period. All data is provided on a state-level basis

⁶⁸ "Decennial Census," United States Census Bureau, last modified August 4, 2022. <https://www.census.gov/programs-surveys/censuses.html#:~:text=It%20helps%20the%20government%20decide.each%20State%20h olds%20in%20Congress.&text=The%20U.S.%20census%20counts%20every%20resident%20in%20the%20United%20States>.

⁶⁹ Historical US Census and Vital Records," Princeton University Library, last modified December 4, 2023, [Access to census information - Historical U.S. census and vital records - Research Guides at Princeton University](#)

⁷⁰ Alba Edward, "Comparative Occupation Statistics 1870 – 1930," Sixteenth Census of the United States (Washington, 1943): 88.

<https://usa.ipums.org/usa/resources/voliii/pubdocs/1940/Population/00312147ch2.pdf>

⁷¹ Ibid.

(and on an even more scrutinised county-level basis, although this is beyond the scope of this paper). The regional specificity of the occupational data allowed for the construction of a comprehensive set of covariates for regression analysis in this project. Moreover, any potential concerns about representativeness are mitigated by the breadth of this source. The second key advantage of using census records is that, from 1860 onwards, the census enquired specifically about women's occupations. Through providing a systematic record of female occupational data, census records have become the key foundational data source for researchers studying the trajectory of women's history.

The main concern with the use of this source, however, is the devaluation of women's nonmarket work and the underestimation of their market work.⁷² This is partly due to the developing definition of "gainful occupation" in pre-1940 censuses.⁷³ Before this year, it was not legally specified what was meant by being gainfully occupied. Thus, when women were asked about their occupation, it depended on how they viewed themselves. For example, if women working in factories considered themselves as part of the labour force or as wives and mothers completing a female task.⁷⁴ This poses the threat of estimates being slightly inaccurate due to response bias. Moreover, this issue is not exclusive to women, as the number of people who are reported under an occupation title does not necessarily include everyone who works in that sector, but only those who consider it as their "sole professed means of support."⁷⁵ However, when weighed up against the inconsistencies and lack of detail in other sources of female occupation data, the risk of response bias from census data appears comparatively much smaller. As census records remain the most extensive source of American occupational data, its use cannot be avoided in this project.

⁷² Nancy Folbre and Marjorie Abel, "Women's Work and Women's Households: Gender Bias in the U.S. Census," *The John Hopkins University Press Vol. 56* (Autumn 1989): 546.

<https://www.jstor.org/stable/40970556>

⁷³ Ibid.

⁷⁴ Riley, "Western Women's History," 66.

⁷⁵ "Remarks Upon the Table of Occupations," 1880 US Decennial Census (Washington, United States Census Bureau): 710.

4.2 100 Years of Marriage and Divorce Statistics

The second primary source that I have utilised is *100 Years of Marriage and Divorce Statistics United States, 1867 – 1967*, a report published by the US Department of Health, Education, and Welfare in December 1973.⁷⁶ It is the most detailed data source containing marriage and divorce information on a state-by-state basis, starting from the first year that such data became available. For this project, available divorce statistics in the period 1880 – 1910 were extracted to use as one of the covariates in the specified hazard-rate regression. During a time when divorce, and divorced women in particular, were looked down upon in society, higher rates of divorce could indicate greater female agency – and thus impact the likelihood of emancipation in a particular state. Furthermore, divorce rates can be seen as a proxy of sorts for religion, as highly religious communities were more likely to have rejected divorce in this period. Divorce statistics for some states (such as South Carolina and Delaware) are not provided as they do not meet the standards of reliability/ precision, and they are also not available for any state in the year 1910. Thus, in this case, I have excluded such states from the analysis and taken into consideration the missing data when evaluating the impact of divorce rates.

A potential concern posed by the use of this data is that methods of collecting divorce data inevitably changed during the period it covered. However, as the data has been thoroughly cleaned and potential outliers have been accounted for, I am confident in saying that minor inconsistencies in measurement have not significantly impacted the outcomes in this paper.

⁷⁶ “100 Years of Marriage and Divorce Statistics United States, 1867 – 1967,” Series 21 No. 24 National Vital Statistics System, US Department of Health, Education, and Welfare (Rockville: National Center for Health Statistics)

5 Trends in female occupational dispersion

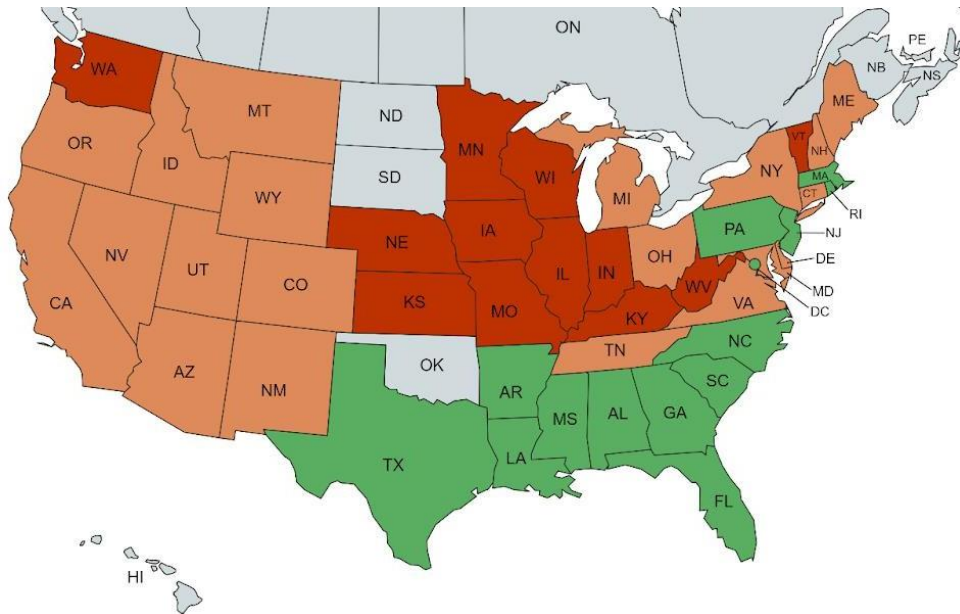
5.1 Thematic cartography

Graphical analysis will now be conducted to confirm my hypothesis that Western women were engaged in a narrower range of occupations than in other regions. To do this, I utilise mapping software to conduct thematic cartography. I split DI scores into three levels: low, medium, and high. These boundaries are decided intuitively, considering that the DI score runs from 0 to 1, and the scores for each state in two different decades are then compared. When using colour coding to depict the DI scores across the US in 1880 – the beginning of the focus period – Figure 2 shows a distinct pattern. The West and Midwest overwhelmingly had the highest DI scores, and thus the most rigid boundaries between the kind of occupations men and women were engaged in. The South, on the other hand, displayed a distinct pattern of low DI scores that were only otherwise present in a few small Eastern states. This pattern proves that women in the West were not somehow exempt from the firm gender expectations of the nineteenth century and that, in fact, they were more stringent here. Whilst there were certainly examples of Western women involved in more stereotypically ‘masculine’ occupations, they were not in general any more flexible in their range of occupations than elsewhere in the United States. The prominence of traditionally male-dominated industries such as agriculture, mining, and ranching in the West in 1880 may have resulted in fewer economic opportunities for women to participate in the labour market, causing the low female labour force participation rates of the West established by Braun and Kvasnicka.⁷⁷ In turn, as fewer were working, there was not enough female labour demand across a range of sectors, explaining the trend witnessed in the region. The high male-female sex ratios may have also perpetuated this, as women in the nineteenth century often only held occupations in male-dominated sectors in the case that a man was not available to do so. In this instance, jobs sometimes changed sex labels when men’s labour became unavailable, for example, due to war or

⁷⁷ Braun and Kvasnicka, “Men, women, and the ballot.”

strikes.⁷⁸ However, since the Western states in general had no shortages of men, such shifts would have been more scarce and so both men and women tended to remain in their traditional occupations.

Figure 2. DI scores in 1880.⁷⁹



Note: Green = DI score 0 – 0.349, Orange = DI score 0.35 – 0.549, Red = DI score 0.55 – 1. DI score information from my original dataset was applied to MapChart.net to produce this diagram as well as Figure 3.

High sex ratios also likely contribute to the high DI scores of the Midwest, where by 1860 the sex ratio was 108.9 men for every 100 women.⁸⁰ However, in this region, I would argue that the DI scores are largely a result of the general trends in the occupations available to Midwestern workers in 1880. Nelson (1995) finds that in 1880, 46% of Midwestern workers were engaged in agriculture, 20% in industry, 10% in trade and transportation, and 23% in personal and professional services.⁸¹ Evidently, agriculture was still dominant in this region, although industry was also growing. In contrast to the Northeast in particular, the classic shift of labour from farm to factory had not yet occurred. Thus, it should be no

⁷⁸ Barbara Reskin and Patricia Roos, “Job Queues, Gender Queues: Explaining Women’s Inroads into Male Occupations,” *Women in the Political Economy* (1990).

⁷⁹ Map created using 1880 Decennial Census data on MapChart.net

⁸⁰ Kleinberg, *Women in the United States*, 51.

⁸¹ Daniel Nelson, *Farm and Factory: Workers in the Midwest 1880 – 1990* (Indiana: Indiana University Press, 1995), 2.

surprise then, that women were not brought into new occupational categories by the same growth in industrial labour demand that other regions experienced, resulting in the high DI scores.

The final key point from Figure 2 is the distinctly low DI scores of the South. Although agriculture was also dominant, this sector possessed unique qualities in the South. Here, agriculture was centred on cash crops grown by slaves and servants, and women were often employed in management roles to oversee this.⁸² Thus, the classification of their work may have fallen into a range of categories. Additionally, the weaker Puritan presence in the South likely contributed to the lower DI scores too, as Puritans often had more stringent rules in controlling female behaviour – which would have applied to their employment too.⁸³ Thus, the prominence of agriculture and the smaller influence of Puritanism in the South are two examples of factors that allowed women to venture into different occupation types.

The same categorisation of DI scores into low, medium, and high is now applied to the 1910 data. Interestingly, some of the previous trends are no longer as pronounced. Figure 3 shows, for instance, that there is now increased variation within the South, as many previously low DI-score states have now become high or medium-score states. The Midwest also experienced some drastic changes, going from almost an entirely high-DI score region to a mixture of low, medium, and high scores. Such changes could be explained by a plethora of factors. For instance, from the 1870s onwards, textile production – in particular, cotton – steadily shifted into the US South.⁸⁴ As a typically female occupation, when the textile industry grew in this region, more women were drawn into these factories. As a result, the spread of women over different occupational categories may have shrunk through this mechanism. Furthermore, from the end of the

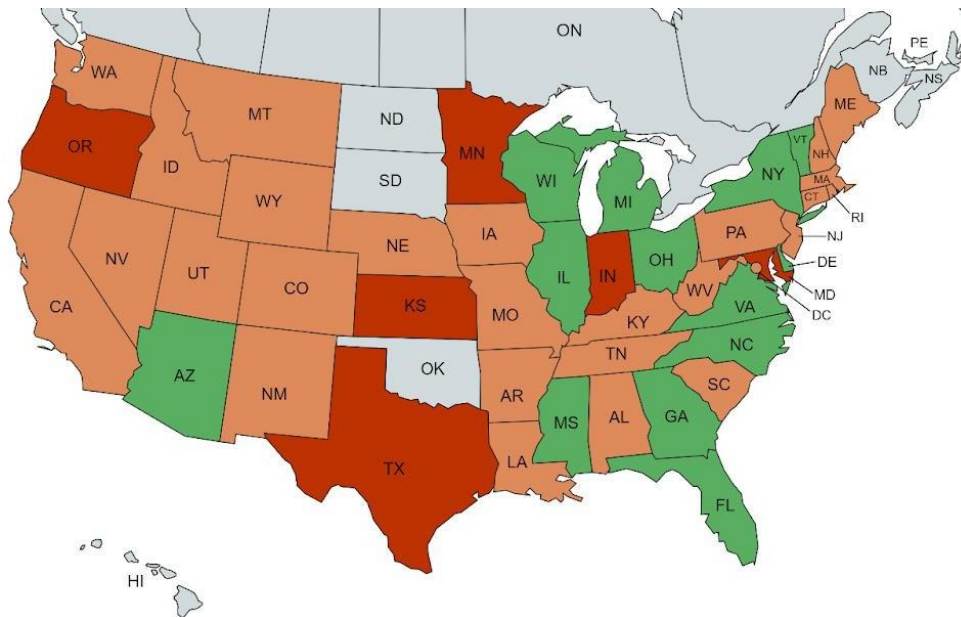
⁸² Alice Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States* (Oxford University Press: 2003), 15.

⁸³ *Ibid.*

⁸⁴ Michele Gillespie, *Global Perspectives on Industrial Transformation in the American South* (Columbia: University of Missouri Press, 2005): 11.

Reconstruction era in 1877 to the start of the 1950s civil rights movement, Jim Crow Laws in the South were enacted.⁸⁵ These legislations enforced racial segregation in public facilities, education, and transportation. The resulting unequal educational opportunities and the crowding out of women of colour from perceived “white-only” jobs may have influenced Southern women’s shift to a smaller range of occupations in this period. As for the Midwest, the transformation away from an almost exclusively high-DI score state may have been driven by factors such as a significant increase in immigration and industry during the age of industrialisation in the decades surrounding 1900. Both immigrants and manufacturing companies were concentrated in the expanding cities of the Midwest and Northeast – thus, through the expansion of the population and potential job opportunities, the gender restrictions on occupations loosened in these regions during this period.⁸⁶

Figure 3. DI scores in 1910.⁸⁷



Note: Green = DI score 0 – 0.349, Orange = DI score 0.35 – 0.549, Red = DI score 0.55 – 1

⁸⁵ Melvin Urofsky, “Jim Crow Law,” Britannica, accessed April 29, 2024.

<https://www.britannica.com/event/Jim-Crow-law/Homer-Plessy-and-Jim-Crow>

⁸⁶ Charles Hirschman and Elizabeth Mogford, “Immigration and the American Industrial Revolution from 1880 to 1920,” *Social Science Research* Vol. 38 (Dec 2009): 898.

⁸⁷ Map created using 1910 Decennial Census data on MapChart.net.

Despite this, the West remained consistent as it continued to have comparatively high DI scores. The only exception to the high DI scores of the West in 1910 was Arizona. This can partially be explained by the population boom caused by the copper rush of the 1880s – as the state became more populated, it was only natural for there to be a wider range of occupations for women to engage in.⁸⁸ The consistency witnessed in the West is crucial information, as it implies that this was a persistent characteristic of these states and that the results witnessed in 1880 were not due to historical events specific to the time. Thus, the preservation of the high DI scores in the West confirms that it is a valuable explanatory variable worth assessing.

5.2 HHI: alternative measures of dispersion

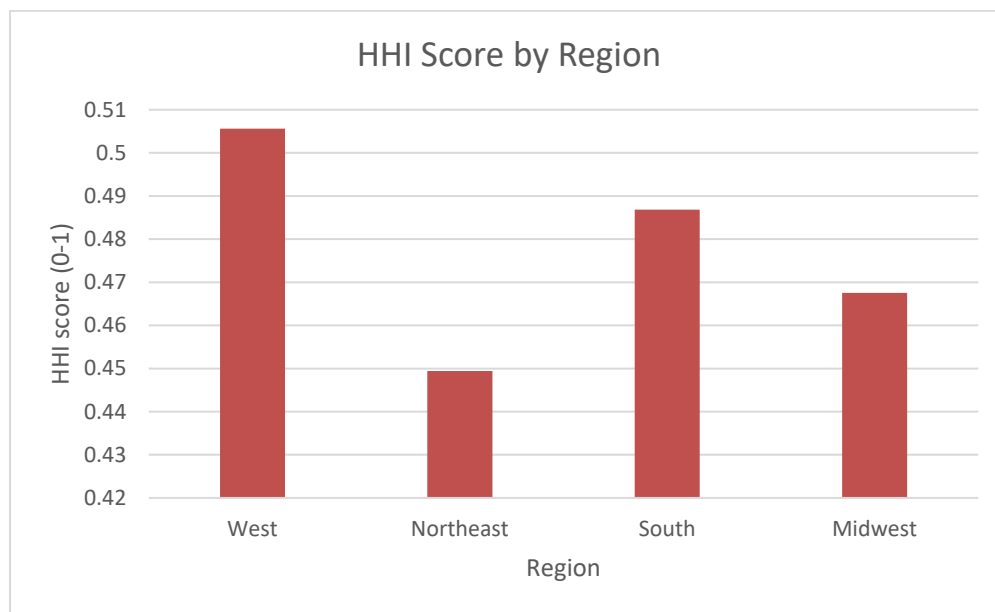
For a robust answer to the narrow question, however, any results utilising DI scores must be checked against another measure of employment dispersion. Then, more confidence can be placed in the results due to cross-validation. The Herfindahl-Hirschman Index (HHI) is chosen as this alternative method. It is typically used to measure the market concentration of firms, however, this paper applies the index to the concentration of women across the four broad occupational categories.⁸⁹ This differs slightly from the Dissimilarity Index, as it is not the comparative spread of men and women over occupational categories that it analyses, but only women. The core strengths of the HHI are that it is relatively simple to calculate and only a small amount of data is needed.⁹⁰

⁸⁸ Eric Clements, *After The Boom In Tombstone And Jerome, Arizona: Decline In Western Resource Towns* (Nevada: University of Nevada Press, 2003).

⁸⁹ “Herfindahl-Hirschman Index,” Antitrust Division U.S. Department of Justice, last modified January 17, 2024. <https://www.justice.gov/atr/herfindahl-hirschman-index#:~:text=The%20term%20“HHI”%20means%20the,then%20summing%20the%20resulting%20numbers.>

⁹⁰ J.B. Maverick, “What are the Benefit and Shortfalls of the Herfindahl-Hirschman Index?” Investopedia, last modified September 21, 2021. <https://www.investopedia.com/ask/answers/051415/what-are-benefits-and-shortfalls-herfindahlhirschman-index.asp#:~:text=The%20primary%20advantages%20of%20the,data%20required%20for%20the%20calculation.>

Figure 4. HHI Score by region



Note: HHI scores were calculated using my original dataset that compiled Decennial Census information.

To use this measure to confirm that Western women were less spread out across occupation types, the proportion of women engaged in each category was divided by the total number gainfully occupied in each decade. Then, these individual figures were squared and summed by state. Following this, I calculated the average HHI score in each state across the study period to find regional averages, which in turn were used to construct Figure 4. A score of 0 indicates perfectly even dispersion of women across all categories, and a score of 1 suggests perfect concentration in one single category. Thus, the closer the score is to 1, the smaller the range of occupations women were engaged in.

With an average HHI score of 0.5056 (4 s.f.), the West had a starkly higher concentration of women across occupational types than the other three regions (0.4494 in the Northeast, 0.4868 in the South, and 0.46753107 in the Midwest). Interestingly, however, the HH measure suggests the Midwest had a more equal distribution than the South – the DI score had suggested the other way around. However, the differences in these scores can partially be explained by the fact that Figure 4 uses averages of all three decades, whereas the previous figures focused on one decade at a time.

Thus, both the HHI and the DI measures of occupational dispersion in Figures 2 – 4 strongly confirm that Western states tended to have stricter boundaries between male and female occupations, resulting in highly segmented labour markets. Therefore, the first part of the narrow question has been answered using thorough evidence that not only were Western women subject to the same occupational constraints as other American women, but occupational gender segregation was even more stringent in this region.

6 Regression analysis

6.1 Baseline regression results

As outlined in the methodology, a complementary log-logistic regression model (A) that includes only the measure of dispersion and period dummies as covariates are initially run. Five states within the West enfranchised women particularly early: Wyoming, Utah, Washington, Colorado, and Idaho. Adapting Braun and Kvasnicka's baseline specification to fit this paper, the importance of these states in the overall relationship between the DI score and the hazard of a state granting voting rights to women is first tested.⁹¹ The results of this regression are summarised in Table 2.

⁹¹ Braun and Kvasnicka, "Men, women, and the ballot," 422.

Table 2. Baseline regression results

Variable	Year binary			
	(1)	(2)	(3)	(4)
Dissimilarity Index	0.0357*** (0.0113)	0.0353*** (0.0117)	0.0366*** (0.0126)	0.0316** (0.0135)
decade_1880s	-0.258 (0.347)	-0.264 (0.360)	-0.278 (0.392)	-0.235 (0.430)
decade_1890s	-0.117 (0.332)	-0.119 (0.344)	-0.131 (0.374)	-0.117 (0.413)
Constant	-2.420*** (0.506)	-2.462*** (0.522)	-2.653*** (0.567)	-2.612*** (0.598)
Observations	184	180	172	164

Note: The dependent variable is a binary variable for the year that equals 0 if a state granted women voting rights after 1919 and equals 1 if before. Model 1 includes all states, Model 2 excludes Wyoming, Model 3 excludes Wyoming, Utah, and Washington, and Model 4 excludes Wyoming, Utah, Washington, Colorado, and Idaho. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Sources: data on the Dissimilarity Index comes from the US Census Bureau's Decennial Censuses 1880 – 1910.

The positive, highly statistically significant dissimilarity coefficients across the results for all four models show that there is a noteworthy relationship between the DI score and the binary year variable. This suggests that as gender segregation over occupational categories increased, the probability of a state granting women voting rights before the passing of the 19th Amendment increased. As I have scaled the DI scores from 0 to 100, in interpretations of the coefficient, a one-unit increase implies a 0.01 increase in the original dissimilarity scale. In Model 1, for every one-unit increase in the DI score, the log odds of a state granting women access to the ballot before 1919 increased by 0.0357 units. The coefficient estimates suggest that a one-unit increase in the DI score is associated with an increase in the hazard of a state granting female voting rights of 3.64 percent ($=\exp(0.0357)-1$).

However, removing the Western states that were the earliest to enfranchise women in Model 4 leads to a slightly smaller coefficient of 0.0316 on the DI score.

This implies that a one-unit increase in the DI score is now associated with an increase in the hazard of a state granting female suffrage of approximately 3.2 percent, a result that is only significant at the 5% level. Thus, through the decline in the size of the coefficient, it is evident that the inclusion of these states holds some level of significance in the positive relationship between the two variables. Therefore, the impact of DI scores on the probability of a state granting women rights before 1919 was stronger within the five earliest Western states. This suggests that the relationship between the two variables is notable, as it not only exists as a wider regional trend but is even sensitive to within-region variations.

6.2 Main regression results

Now, the main regression analysis using Models A to D specified earlier in the paper will be conducted. For the main regression, Model (A) – a complementary log-logistic regression that only includes dissimilarity and period dummies as covariates – is run to begin with, which is identical to the baseline regression specification in Table 2. This showed that increasing the DI score increased the hazard of a state granting female voting rights before 1919 by approximately 3.64 percent, a result that is significant at the 1% level.

Moreover, this effect is robust to the inclusion of the foreign-born variable in Model B. This newly added variable is defined as the percentage of the total population in a state that was born in a foreign country. In this case, the coefficient on the DI score increases slightly to 0.03753, which corresponds to roughly a 3.8 percent increase in the hazard of early enfranchisement for every one-unit increase in the DI score. Additionally, the coefficient of 0.0956 on the foreign-born variable suggests that a one-unit increase in the percentage of residents that are foreign-born in a state is associated with approximately a 10.04 percent increase in the odds of a state granting female voting rights before 1919 relative to after.

Table 3. Main regression results

VARIABLE	Year binary			
	(A)	(B)	(C)	(D)
Dissimilarity Index (%)	0.0357*** (0.0113)	0.0375*** (0.0123)	0.0440** (0.0199)	0.00247 (0.0285)
Foreign-born (%)		0.0956*** (0.0147)	0.122*** (0.0254)	0.0919*** (0.0279)
Divorce rate (%)			0.383*** (0.0872)	0.218** (0.101)
Sex ratio (%)				0.0792** (0.0373)
decade_1880s	-0.258 (0.347)	-0.578 (0.379)	0.275 (0.557)	0.342 (0.807)
decade_1890s	-0.117 (0.332)	-0.388 (0.348)	0.342 (0.528)	0.233 (0.687)
Constant	-2.420*** (0.506)	-4.080*** (0.645)	-8.370*** (1.742)	-13.43*** (3.617)
Observations	184	184	135	135

Note: standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Increasing covariates are now added to the regression model, with divorce rates being incorporated in Model C. Now, the coefficient on the dissimilarity index takes on a higher value and remains significant, but only at the 5 percent level. In this specification, a one-unit increase in the DI score is associated with approximately a 4.51 percent increase in the odds of a state giving women the vote before the 19th Amendment was passed. The percentage of residents that are foreign-born in a state and the divorce rate also both show positive and highly statistically significant coefficients, having an effect of roughly 12.9 percent and 46.6 percent respectively on the odds of early enfranchisement. Lastly, the coefficient on the sex ratio corresponds to a one-unit increase in the DI score being associated with approximately an 8.2 percent increase in the hazard of female suffrage before 1919, a result that is statistically significant at the 5 percent level.

Finally, in Model D, the sex ratio is added to the regression. In wider literature, high male-female sex ratios have been established to be a key explanatory variable for why Western states granted women the right to vote first. Thus, a positive, strongly statistically significant coefficient is expected to be seen on this variable. This is exactly what is shown in Table 3. A one-unit increase in the male-female sex ratio increases the odds of granting female voting rights before 1919 relative to after by approximately 8.29 percent, a result that is significant at the 5 percent level. The coefficients on foreign-born and divorce rates correspond with approximate increases of 9.7 percent and 24.3 percent in the aforementioned odds, both results being statistically significant. A one-unit increase in the DI score is now associated approximately with a 0.24% increase in the hazard of a state granting women voting rights before 1919 relative to after 1919. The relationship between a high DI score and the early enfranchisement remains positive – albeit weaker. Furthermore, this effect is no longer statistically significant. This implies that the sex ratio was an especially effective control in determining the impact of female occupational dispersion on the timeline of voting rights.

7 Results discussion

7.1 Results interpretation

To summarise, the analysis so far has shown that women in the West were engaged in a smaller range of occupations – as implied by the higher DI scores. Moreover, the regression analysis has shown that the DI scores held explanatory power in why these states granted women voting rights before the passage of the 19th Amendment, a result that is statistically significant until sex ratios are considered in Model D. This implies that when a full set of controls are applied, the influence of the DI score on female voting rights was not as poignant, but still existent. This answers the second part of my narrow question directed at quantifying the impact of female occupational dispersion.

There are a few mechanisms through which this influence could have occurred. Firstly, a high concentration of women in specific occupations facilitated the formation of organised networks and associations that advocated for women's rights. Similarly, strategic mobilisation for suffrage campaigns was enabled. This mechanism would be consistent with the findings of Campbell and McCammon, who found that Western suffragist movements were often able to use more effective strategies than their Eastern and Southern counterparts.⁹² Secondly, women's economic contributions in certain occupations provided power for warranted their demands for voting rights. For instance, states that were reliant on female-dominated industries such as textiles may have granted women access to the ballot early as a recognition of their economic contributions. However, this mechanism is less convincing as the textile industry shifted into the South from the 1870s onwards, and this seemingly did not impact their voting rights timeline.⁹³

Some of the other results from the main regression contrast previous hypotheses put forth by other studies of North American women's suffrage. For instance, the notion that the percentage of foreign-born citizens in a state decreases the likelihood of female suffrage is disproved by the results of this paper. The difference in results can be accounted for by the fact that such studies specify ethnic groups that were especially likely to have strongly opposed female suffrage, such as German and Irish communities due to their traditional beliefs about women's role in society.⁹⁴ Higher numbers of immigrants from some ethnic groups, on the other hand, are acknowledged to have increased the likelihood of female suffrage. For instance, Italian immigrants had a positive effect on the outcome of female enfranchisement.⁹⁵ As the effect found in Table 3 is positive, it suggests that the overall effect was that such groups outweighed the negative impact of more traditional communities.

⁹² Campbell and McCammon, "Winning the Vote in the West."

⁹³ Melvin Urofsky, "Jim Crow Law," Britannica, accessed April 29, 2024. <https://www.britannica.com/event/Jim-Crow-law/Homer-Plessy-and-Jim-Crow>

⁹⁴ McCammon, Campbell, Granberg & Mowery, "How Movements Win," 54. <https://doi.org/10.1177/000312240106600104>

⁹⁵ Braun and Kvasnicka, "Men, women, and the ballot," 422.

The impact of divorce rates on the timing of female voting rights in the US from Table 3 is also intriguing. It shows that in the final specification, divorce rates had a statistically significant effect of 24.3% on the outcome – this suggests that states with more divorced individuals residing in it were more likely to grant women voting rights before 1919. The motivation behind including this variable in my regression analysis was because divorce rates not only indicate the level of female autonomy in a society but may also suggest how large of an influence religion has in that society. Therefore, the results suggest that Western states likely had higher levels of female autonomy, which allowed them to have more agency in their personal and professional lives. They may also suggest that religion did not have as strong an influence in the West, which contradicts some of the wider literature suggesting the prominence of Mormon and Puritan motives for granting the female vote. However, as divorce rates are an imperfect proxy for religion, this aspect of the argument cannot be made with full certainty. Furthermore, as there were comparatively fewer observations for divorce statistics in my dataset, there is a possibility that the size of the impact has been slightly overstated.

7.2 Endogeneity concerns

Two notable factors pose a threat to the validity of the economic strategy and the interpretations drawn from it. These must be mitigated to ensure my results are not subject to bias.

Firstly, regional-specific factors such as the presence of suffrage organisations, or their membership rates, may have affected the timing of when a state granted female voting rights. If Western states had a stronger presence of such networks, this could have impacted the dependent variable, meaning that my estimates for the impact of the DI score would be overstated. However, qualitative evidence weakens this concern. It has been found that approximately half of the Eastern and Southern states had an excess of three suffrage organisations during the peak of their movements, whilst this was only the case for one-third of Western

states.⁹⁶ Evidently, the West was not superior in terms of the presence of suffrage organisations. Teele (2018) provides complementary evidence that suffrage membership was also weaker in the West than in the Northeast, ruling out the concern of higher membership rates.⁹⁷ Thus, it is reasonable to assume that such regional-specific factors did not benefit the West in its movement towards female suffrage.

Secondly, the chosen econometric strategy could be subject to endogeneity concerns, in particular, reverse causality. It could be argued that whether a state had granted women voting rights before the 19th Amendment affected both the level of labour force participation and the type of work women were engaged in. For instance, the early enfranchisement of women could indicate the low level of threat that female employment posed to men and traditional gender roles – perhaps because women in the earliest states to gain access to vote were still primarily confined to the home or traditionally female occupations. As established in the wider literature and earlier in my analysis, this would be a viable concern considering the West displayed the characteristics of a high male-female sex ratio and relatively low female labour force participation, both suggesting comparatively less threat posed by female suffrage in the region.

To test quantitatively for this concern, I replace the dependent variable with the DI scores and the regressor of interest with the binary year variable. As the outcome is no longer a binary variable and the regressor of interest only has two levels, I use a simple linear regression to conduct this test. If the coefficient on the year variable is statistically significant and positive, concerns regarding reverse causality would be confirmed, as states that granted women voting rights before 1919 had higher DI scores. Table 4 shows that this is neither the case for Model C nor Model D from my main regression analysis. Thus, concerns regarding reverse causality have been sufficiently mitigated.

⁹⁶ Campbell and McCammon, “Winning the Vote in the West,” 60.

⁹⁷ Dawn Langan Teele, “How the West Was Won: Competition, Mobilization, and Women’s Enfranchisement in the United States,” *The Journal of Politics* Vol. 80 (Apr 2018): 450.

Table 4. Testing for reverse causality

VARIABLES	(1)	(2)
Year	4.027 (3.255)	1.701 (3.603)
Sex ratio		0.0769 (0.0521)
Divorce rate	-0.220 (0.323)	-0.314 (0.328)
Foreign-born	0.112 (0.126)	0.0679 (0.129)
Constant	38.56*** (2.632)	31.68*** (5.343)
Observations	135	135
R-squared	0.034	0.050

Note: the dependent variable is now the DI score, and the independent variable is the binary year. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

8 Conclusion

Female labour force participation trends provide crucial insight into gender role expectations and the level of female agency in society. By discerning regional patterns, then, wider trends in female emancipation can be studied. This paper has focused on regional differences in the level of dispersion of women over occupational categories in the late nineteenth to early twentieth century USA. Specifically, it has investigated whether such variations impacted the tendency of Western states to grant women voting rights before the 19th Amendment. I hypothesised that this would indeed be the case, and this paper has proven that this is true to an extent.

Firstly, the graphical analysis established clear, persistent regional patterns in occupational dispersion. This was also tested using the HHI, an alternative measure of dispersion, and the West continued to show the highest concentration of female workers. As this implies a consistent trend throughout the late 19th to early 20th century, the distribution of women over professions was rendered an

important point of study. Following this, I used the original dataset that I have assembled to conduct complementary log-logistic regression analysis to verify the impact of this characteristic on the timing of female voting rights. Endogeneity concerns in these results were also mitigated. By facilitating strategic mobilisation and more *effective* appeals for suffrage, the concentration of women in specific sectors contributed to the winning of the female vote in a region where suffrage organisations did not appear to be as strong in numbers.

The establishment that the West had low female occupational dispersion is an original contribution, and therefore, the investigation of the role of this characteristic in political life has led us to a better understanding of regional differences in the lead-up to female suffrage. Furthermore, this contribution can be taken to explore other avenues through which female political rights may have been influenced. Although the role of female labour force participation rates on American female enfranchisement has been briefly studied in the wider literature, this paper investigated a nuanced aspect of employment. Through doing so, I have found that the level of gendered segregation across occupational categories did indeed influence the timing of a state's decision to allow the female vote. However, although female occupational dispersion levels exerted notable influence, their impact was not statistically significant and so cannot be described as *causal*.

This paper has also contributed to the wider debates in studies concerning what caused Western states to grant women voting rights comparatively early. In particular, I looked at the impacts of the percentage of foreign-born residents, divorce rates, and sex ratios. Firstly, the positive contributions that certain ethnic communities like Italian-Americans made to the suffrage movement were found to have outweighed the negative impact of more traditional communities. Secondly, higher divorce rates in the West had a significant impact on the granting of female voting rights before 1919. As divorce rates can arguably indicate the level of female autonomy in a society, it is hardly surprising that those same societies enfranchised women first. Finally, the widely acknowledged

causal effect of the West's high male-female sex ratios is confirmed in this paper. This skewing of sex ratios meant that there was a lower cost of female suffrage to men, thus increasing the probability of this event occurring early. Clearly, there was not one single factor that caused the early enfranchisement of women in the West. A plethora of different forces had to come together to push for this regional trend - but by analysing the role of female labour force trends on American women's suffrage, this paper has provided an answer to a thus far unexplored avenue.

A potential area for further research on this subject could be to investigate more nuanced occupational categories. In this paper, only the four categories listed in the census were used, but perhaps the breakdown of jobs into smaller categories would provide new insights into debates over the role of female labour force participation trends in regional differences in the success of female emancipation.

Bibliography

Primary sources:

- Edward, Alba. Comparative Occupation Statistics 1870 – 1930. Sixteenth Census of the United States. Washington, 1943. 88.
<https://usa.ipums.org/usa/resources/voliii/pubdocs/1940/Population/00312147ch2.pdf>
- “Remarks Upon the Table of Occupations.” 1880 US Decennial Census. Washington, United States Census Bureau. 710.
- U.S. Census Bureau. Tenth Census of the United States, 1880. Washington, D.C.: U.S. Government Printing Office, 1880.
- U.S. Census Bureau. Eleventh Census of the United States, 1890. Washington, D.C.: U.S. Government Printing Office, 1890.
- U.S. Census Bureau. Twelfth Census of the United States, 1900. Washington, D.C.: U.S. Government Printing Office, 1900.
- U.S. Census Bureau. Thirteenth Census of the United States, 1910. Washington, D.C.: U.S. Government Printing Office, 1910.
- U.S. Department of Health, Education, and Welfare, National Center for Health Statistics. “100 Years of Marriage and Divorce Statistics United States, 1867 – 1967,” Series 21 No. 24 National Vital Statistics System. Rockville: National Center for Health Statistics.
- Wright, Carroll. *A Report on Marriage and Divorce in the United States, 1867 – 1886: including an appendix relating to marriage and divorce in certain countries in Europe*. Washington: United States Bureau of Labour, 1891.

Secondary literature:

- “Alaska Census.” FamilySearch. Last modified November 10, 2023.
https://www.familysearch.org/en/wiki/Alaska_Census#:~:text=Alaska%20was%20purchased%20by%20the,counts%20until%20the%201900%20census.
- Armitage, Susan and Elizabeth Jameson. *The Women’s West*. Oklahoma: University of Oklahoma Press, 1987.
- Beeton, Beverely. *Women Vote in the West: The Woman Suffrage Movement, 1869 – 1896*. New York: Garland Publishing, 1986.
- Braun, Sebastian and Michael Kvasnicka. “Men, women, and the ballot: Gender imbalances and suffrage extensions in the United States.” *Explorations in Economic History Vol. 50* (July 2013): 406 - 422.
<https://doi.org/10.1016/j.eeh.2013.04.001>
- Campbell, Karen and Holly McCammon. “Winning the Vote in the West: The Political Successes of the Women’s Suffrage Movements, 1866 – 1919.” *Gender and Society Vol. 15* (Feb 2001): 55 - 77
<https://www.jstor.org/stable/3081830>
- Clark, Elizabeth. “The Politics of God and the Woman’s Vote: Religion in the American Suffrage Movement, 1848 – 1895.” (PhD diss., Princeton University, 1989): 2.
- Clements, Eric. *After The Boom In Tombstone And Jerome, Arizona: Decline In Western Resource Towns*. Nevada: University of Nevada Press, 2003.

- “Decennial Census.” United States Census Bureau. Last modified August 4, 2022. <https://www.census.gov/programs-surveys/censuses.html#:~:text=It%20helps%20the%20government%20decide,each%20State%20holds%20in%20Congress.&text=The%20U.S.%20census%20counts%20every%20resident%20in%20the%20United%20States>
- Edge, Sara Anna. “When we get to voting”: Rural women, community, gender, and woman suffrage in the Midwest.” (PhD diss., Iowa State University, 2012): 2.
- Folbre, Nancy and Marjorie Abel. “Women’s Work and Women’s Households: Gender Bias in the U.S. Census.” *The John Hopkins University Press Vol. 56* (Autumn 1989): 546. <https://www.jstor.org/stable/40970556>
- “Geographic Levels.” United States Census Bureau. Last modified October 8, 2021. <https://www.census.gov/programs-surveys/economic-census/guidance-geographies/levels.html>
- Gillespie, Michele. *Global Perspectives on Industrial Transformation in the American South*. Columbia: University of Missouri Press, 2005.
- Goldin, Claudia. “The Quiet Revolution That Transformed Women’s Employment, Education, and Family.” *American Economic Review Vol. 96* (May 2006): 4.
- Goldin, Claudia. *Schultz TP Investment in Women’s Human Capital and Economic Development*. Chicago: University of Chicago Press, 1995.
- Green, Rodney. “The Dissimilarity Index: A Tutorial,” Howard University. Accessed March 2, 2024. [The Dissimilarity Index: A Tutorial | Howard University COAS Centers](#).
- Grimes, Alan. *The Puritan Ethic and Woman Suffrage*. New York: Oxford University Press, 1967. <https://doi.org/10.2307/1953418>
- Haller, William and Malleville Haller. “The Puritan Art of Love.” *Huntington Library Quarterly Vol. 5* (Jan 1942)
- “Herfindahl-Hirschman Index.” Antitrust Division U.S. Department of Justice. Last modified January 17, 2024. <https://www.justice.gov/atr/herfindahl-hirschman-index#:~:text=The%20term%20“HHI”%20means%20the,then%20summing%20the%20resulting%20numbers>.
- Hirschman, Charles and Elizabeth Mogford. “Immigration and the American Industrial Revolution from 1880 to 1920.” *Social Science Research Vol. 38* (Dec 2009): 898.
- Historical US Census and Vital Records.” Princeton University Library. Last modified December 4, 2023. [Access to census information - Historical U.S. census and vital records - Research Guides at Princeton University](#)
- “Housing Patterns: Appendix B: Measures of Residential Segregation.” United States Census Bureau. Last modified November 21, 2021. <https://www.census.gov/topics/housing/housing-patterns/guidance/appendix-b.html>
- Kenny, Lawrence. “Explaining the puzzle of why men gave women the right to vote.” University of Florida Working Paper (1999).
- Kessler-Harris, Alice. *Out to Work: A History of Wage-Earning Women in the United States*. Oxford University Press: 2003.

- Kirby, Timothy Joel. "Women's Suffrage in the United States: A Synthesis of the Contributing Factors in Suffrage Extension." (MA Diss., Miami University, 2020), 17.
- Kleinberg, S.J. *Women in the United States, 1830 – 1945*. London: Red Globe Press, 1999.
- Maverick, J.B. "What are the Benefits and Shortfalls of the Herfindahl-Hirschman Index?" Investopedia. Last modified September 21, 2021. <https://www.investopedia.com/ask/answers/051415/what-are-benefits-and-shortfalls-herfindahlhirschman-index.asp#:~:text=The%20primary%20advantages%20of%20the,data%20required%20for%20the%20calculation>
- McCammon, Holly, Karen Campbell, Ellen Granberg & Christine Mowery. "How Movements Win: Gendered Opportunity Structures and U.S. Women's Suffrage Movements, 1866 to 1919." *American Sociological Review Vol. 66* (Feb 2001): 51 - 54. <https://doi.org/10.1177/000312240106600104>
- McDonagh, Eileen & H. Price. "Woman Suffrage in the Progressive Era: Patterns of Opposition and Support in Referenda Voting, 1910 – 1918." *American Political Science Review Vol. 79* (June 1985): 1. <https://doi.org/10.2307/1956657>
- Nelson, Daniel. *Farm and Factory: Workers in the Midwest 1880 – 1990*. Indiana: Indiana University Press, 1995.
- "Oklahoma Statehood, November 16, 1907," The Center for Legislative Archives. Last modified March 1, 2024. <https://www.archives.gov/legislative/features/oklahoma#:~:text=On%20September%2017%2C%201907%20the,as%20the%20forty%2Dsixth%20state>.
- Olivetti, Claudia. "The Female Labor Force and Long-run Development: The American Experience in Comparative Perspective." (Boston University and NBER, 2013)
- Reskin, Barbara and Patricia Roos. "Job Queues, Gender Queues: Explaining Women's Inroads into Male Occupations." *Women in the Political Economy* (1990).
- Riley, Glenda. "Western Women's History – A Look at Some of the Issues." *Montana The Magazine of Western History Vol. 41* (Spring 1991): 66 - 69 <https://www.jstor.org/stable/4519384>
- Rosaldo, Michelle Zimbalist & Louise Lamphere. *Woman, Culture, and Society: A Theoret Overview*. California: Stanford University Press, 1974.
- Scott-Smith, Giles. "From Symbol of Division to Cold War Asset: Lyndon Johnson and the Achievement of Hawaiian Statehood in 1959." *The Journal of the Historical Association Vol. 89* (March 2004)
- Smith, James & Michael Ward. "Time-Series Growth in the Female Labor Force." *Journal of Labour Economics Vol. 3* (Jan 1985): 59. <https://www.jstor.org/stable/2534998>
- Teele, Dawn Langan. "How the West Was Won: Competition, Mobilization, and Women's Enfranchisement in the United States." *The Journal of Politics Vol. 80* (Apr 2018): 450.
- Urofsky, Melvin. "Jim Crow Law." Britannica. Accessed April 29, 2024. <https://www.britannica.com/event/Jim-Crow-law/Homer-Plessy-and-Jim-Crow>

- Warner, Deborah. "Perfect in Her Place: Women at Work in Industrial America." *Smithsonian Institution* (1981): 1 – 16. <https://eric.ed.gov/?id=ED260963>
- Welter, Barbara. "The Cult of True Womanhood: 1820: 1860." *American Quarterly* Vol. 18 (1966).
- Woodworth-Ney, Laura. *Women in the American West*. California: ABC-CLIO, 2008
- "19th Amendment By State." National Park Service. Last modified July 22, 2020. <https://www.nps.gov/subjects/womenshistory/19th-amendment-by-state.htm>
- "19th Amendment to the U.S. Constitution: Women's Right to Vote (1920)." National Archives. Last modified February 8, 2022. <https://www.archives.gov/milestone-documents/19th-amendment#:~:text=Passed%20by%20Congress%20June%204,decades%20of%20agitation%20and%20protest>

Appendix

US Regions and Divisions as defined by the Census Bureau:

Northeast: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, and Pennsylvania

Midwest: Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota

South: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas

West: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Wyoming, Alaska, California, Hawaii, Oregon, and Washington