

Left On Top: Women World Leaders & Political Ideologies

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ABSTRACT

In the past 10 years, women have significantly increased representation in many sectors of the working field [1]. Yet, one field in specific, the political field, continues to show an overwhelming lack of female representation. Whereas women are exponentially showing interest in political leadership positions, the percentage of women who hold these positions have only slightly increased to a small minority of 26 percent [2]. Thus, it is important to examine the factors contributing to a woman's entrance into a political leadership position. Because each country offers many different political positions, this paper narrows the data by focusing on the highest and most powerful level of political office that a person can hold in each country, whether that be head of state (President), or head of government (Prime Minister). Since there has been heavy research already done regarding social and economic factors influencing women's empowerment, this paper examines a political factor, or more specifically, the political leaning of the office's predecessors. All the female heads of state and government in history were listed by country, and each of the female leader's predecessors were categorized into a political leaning (left, center, right, other). Each country was assigned a "left percentage," or percentage of left leaning predecessors for each female leader. From the data, a Power Regression test and Chi Squared Test concluded that an increase in the percentage of left leaning presidents or prime ministers predecessors, correlates to a decrease in the number of election cycles passed before a woman occupies the country's political office. With more women as world leaders, the world can expect to see the benefits of poverty reduction, economic progress, and increase of public assistance programs.

Background & Purpose

It hasn't been until the 20th century that women have begun to take visible political leadership positions, with Sirimavo Bandaranaike becoming the world's first female elected Prime Minister in 1960 and Isabel Perón of Argentina becoming the first woman President in 1974 [3]. In 2015, a "record high" number of women world leaders was reported. Yet, that number of 27 women world leaders did not even come close to the 176 male world leaders in power in 2015. With only 10 percent of countries run by women, women voices are consistently underrepresented in making policy decisions of key issues that affect them such as war, peace, labor, and health [4]. This disparity of women world leaders is not something to be ignored, as the increase of women world leaders yield groundbreaking results. International experts agree that focusing on women's empowerment is integral to increase social and economic prosperity. Women's empowerment has been consistently linked to poverty reduction and economic progress, and an increase in female leadership has been shown to correlate to a decrease in a country's violence and warfare [5]. With all the benefits linked to an increase in women world leaders, it is important to examine the factors contributing to increased representation. Past research has focused on linking a country's social and economic factors such as education, cultural gender roles, and economic conditions to an increased presence of women world leaders. But, there has been less research done to analyze which political systems support women's empowerment and political representation. A question that is still unclear is the influences of a political system's leanings (left, center, right) on female representation in world leadership.

Many people seem to believe that women are more liberal and open-minded than men [6], and this particular belief works both for and against a woman's favor. In countries who highly value national security and international relations, women are seen as incapable of being strong, decisive leaders [7]. However, in countries that place social and humanitarian causes such as combating poverty, education, and inequality as their highest priorities, women are seen as more understanding leaders [8]. This division is further pronounced by party affiliation. Generally, liberals of left-wing parties have been found to be more supportive of a woman in office compared to those who identify with a right-wing party [7]. While left-wing and right-wing are two terms with Eurocentric origins, it's important to note that these two terms are broadly encompassing and can be applied to most countries. Left-wing parties are tied by common trends of progressivism, but left-wing issues will be different for each country. For example, although the fight for transgender restrooms and abortion rights are prevalent left-wing issues in the United States, left-wing parties in Burundi rather focus on issues such as government provided social services and prevention for violence against women.

Questions

After a preliminary background study on the factors contributing to an increase in female political representation, it was apparent that more research needed to be conducted on political factors. As there are numerous existing political systems, with countries having as many as hundreds of different political parties, the broad political factor of a political system's leanings (left, center, right) was determined the best way to categorize women world leaders. This paper seeks to answer the following questions: Is there a correlation between the percentage of a country's left leaning presidents or prime ministers' predecessors and the number of election cycles passed before a woman occupies the country's political office? If so, does this left political leaning reflect itself throughout history in the party positions of women world leaders?

Argument

Generally, left-leaning political systems are more likely to represent progressive social, economic, and political change. This is because left-wing ideology is liberal in the sense that it supports an expanded role of the government. It places more responsibility on the government to guarantee and fund public services, and one category of such public services include women's public services, whether they be increased educational opportunities for women or increased protection against women sexual violence [9]. Thus, I argue that left-wing political systems are more likely to welcome a women world leader into the position of prime minister or president. An increased percentage of left-wing predecessors correlates to a decrease in the number of election cycles before a country has a women world leader in office.

Methodology

Question 1: Is there a correlation between the percentage of a country's left leaning presidents or prime ministers predecessors and the number of election cycles passed before a woman occupies the country's political office?

Independent Variable: Percentage of Left-Wing Predecessors

To determine the percentage of left-wing predecessors, a list was composed of all women world leaders who had served, or who are serving, the position of prime minister or president of a country. For countries who had more than one female leader, the "first" female leader, or the female leader that had been elected or appointed earlier was chosen. The "first" female leader was interpreted in three different ways by three different lists. List 1 shows the

first female leader to serve as president in a country. List 2 shows the first female leader to serve as prime minister in a country. List 3 shows the first female leader to serve as prime minister or president in a country. List 3 is not a combination of the data from List 1 and List 2. Rather than displaying both the first female president and the first female prime minister for countries who experienced both, List 3 shows only the female leader that had been elected or appointed earlier out of the two.

For each woman on each list, the political parties of her predecessors were categorized into left, right, center, or other leanings. Her predecessors included every person who had held the office before her till the start of the country's specific form of government today. Generally, left-wing politics emphasizes "freedom, equality, progress, reform, and internationalism", whereas right-wing politics emphasizes "authority, order, tradition, and nationalism. [9]" A widely regarded political spectrum chart, the Nolan Chart was established in 1969 to categorize left, right, center, and other leanings. Left was categorized as those who supported high personal freedoms and low economic freedoms, while right was categorized as those who supported low personal freedoms and high economic freedoms [10]. With this methodology, after categorizing each women world leaders' predecessors' political leanings, the "left" percentage was determined to the nearest hundredth by the number of predecessors who held left-wing parties.

Dependent Variable: Number of Election Cycles Before "First" Female Leader

For each woman on each "first" female leader list, the number of election cycles before the country's "first" female leader was researched. The number of election cycles was calculated by the number of predecessors the first female leader had that occupied her office before.

Testing Process: Power Regression Tests

For each of the three lists: the first female president of a country, the first female prime minister of a country, and the first female prime minister or president of a country, multiple regression tests were conducted to determine which regression was the best fit for the list data. A regression test would indicate the data's level of correlation, which is what Question 1 is attempting to conclude. The best fit regression test would yield the highest r-squared value, as a higher r squared value correlates to less of a variance in the data from the fitted function. After conducting a linear, quadratic, cubic, quartic, logistic, power, and exponential regression test, the best fit regression test for each of the three lists was determined to be a power regression test. The power regression test yielded the highest r-squared for each list.

Exceptions: There were a few data points that were not included for each of the three lists. For List 1 (Presidents), the women world leaders of China, Gabon, Iceland, Nepal, and Peru were not included. China and Gabon both have one party systems, and Iceland is having a history of independent presidents not affiliated with any party. Nepal and Peru have multi party political systems, which ensures that no one left-wing or right-wing party has the dominant power. For List 2 (Prime Ministers), the women world leaders of Burundi and Transnistria were removed. Transnistria has a history of independent prime ministers not affiliated with any party, and Burundi has a history of nationalistic, military prime ministers not affiliated with any party. For List 3, the women world leaders of countries mentioned beforehand, if applicable, were removed.

List 1: Presidents

| Name | Country | Date Election | Left % : x value | Election#: y value |
|--------------------|-------------------|---------------|------------------|--------------------|
| el Martínez de P | Argentina1 | 7/1/1974 | 0.22 | 38 |
| arbara Pramme | Austria1 | 7/6/2004 | 0.45 | 10 |
| dia Guelier Tejad | Bolivia | 11/16/1979 | 0.08 | 67 |
| Dilma Rousseff | Brazil | 1/1/2011 | 0.13 | 36 |
| Sylvie Kinigi | Burundi1 | 10/27/1993 | 0.7 | 5 |
| herina Samba Pai | Central African R | 1/23/2014 | 0.4 | 14 |
| Michelle Bachelet | Chile1 | 3/11/2006 | 0.19 | 35 |
| Laura Chinchilla | Costa Rica | 5/8/2010 | 0.27 | 46 |
| inda Gabar-Kitaro | Croatia2 | 2/19/2015 | 0.6 | 4 |
| alia Arteaga Serr | Ecuador | 2/9/1997 | 0.1 | 39 |
| Kersti Kaljulaid | Estonia | 10/10/2016 | 0.33 | 5 |
| Tarja Halonen | Finland3 | 3/1/2000 | 0.4 | 11 |
| Nino Burjanadze | Georgia1 | 11/23/2003 | 0.66 | 3 |
| Angela Merkel | Germany | 11/22/2005 | 0.38 | 8 |
| Carmen Pereira | Guinea-Bissau2 | 5/14/1984 | 1 | 3 |
| Janet Jagan | Guyana2 | 12/19/1997 | 0.8 | 6 |
| tha Pascal-Trouill | Haiti4 | 3/13/1990 | 0.1 | 37 |
| Pratibha Patil | India2 | 7/25/2007 | 0.428 | 12 |
| gawati Sukarnop | Indonesia | 7/23/2001 | 0.5 | 5 |
| Mary Robinson | Ireland1 | 12/3/1990 | 0.5 | 7 |
| Dalia Itzik | Israel2 | 1/25/2007 | 0.75 | 9 |
| Atifete Jahjaga | Kosovo | 4/7/2011 | 0.6 | 3 |
| Roza Otunbayeva | Kyrgyzstan | 4/7/2010 | 0.7 | 5 |
| aira Vīke-Freiberg | Latvia2 | 7/8/1999 | 0.33 | 6 |
| Ruth Perry | Liberia1 | 9/3/1996 | 0.2173 | 24 |
| Dalia Grybauskaitė | Lithuania3 | 7/12/2009 | 0.5 | 5 |
| Joyce Banda | Malawi | 4/7/2012 | 0.66 | 3 |
| Agatha Barbara | Malta1 | 2/15/1982 | 0.66 | 3 |
| que Ohsan Belleç | Mauritius1 | 3/31/2012 | 0.875 | 5 |
| chbaataryn Yanjm | Mongolia2 | 9/7/1953 | 0.875 | 9 |
| ung San Suu Kyi | Myanmar | 4/6/2016 | 1 | 1 |
| Violeta Chamorro | Nicaragua | 4/25/1990 | 0.137 | 32 |
| Mierya Moscoso | Panama | 9/1/1999 | 0.13 | 34 |
| Corazon Aquino | Philippines1 | 2/25/1986 | 0.33 | 11 |
| ica Đukić Dejan | Serbia | 4/5/2012 | 0.217 | 17 |
| Matsepe Casabu | South Africa | 9/24/2008 | 1 | 3 |
| Park Geunhye | South Korea3 | 2/25/2013 | 0.18 | 11 |
| ndrika Kumaratur | Sri Lanka2 | 11/12/1994 | 0.6 | 5 |
| Elisabeth Kopp | Switzerland1 | 10/21/1984 | 0.086 | 94 |
| Tsai Ing-wen | Taiwan | 5/20/2016 | 0.5 | 7 |

List 2: Prime Ministers

| Name | Country | Date Election | Left%:x value | Election#:y value |
|--------------------|------------------|---------------|---------------|-------------------|
| Julia Gillard | Australia | 6/24/2010 | 0.48 | 27 |
| Cynthia Pratt | Bahamas | 5/4/2005 | 0.71 | 3 |
| Khaleda Zia | Bangladesh1 | 2/27/1991 | 0.56 | 9 |
| Reneta Indzhova | Bulgaria | 10/17/1994 | 0.25 | 44 |
| Kim Campbell | Canada | 6/25/1993 | 0.42 | 19 |
| mayo Bandarana | Ceylon1/Sri Lank | 7/21/1960 | 0.33 | 6 |
| Jadranka Kosor | Croatia1 | 7/6/2009 | 0.40 | 9 |
| lle Thorning-Schr | Denmark | 10/3/2011 | 0.50 | 27 |
| me Eugenia Char | Dominica | 7/21/1980 | 0.71 | 2 |
| nneli Jäättteenmä | Finlad1 | 4/17/2003 | 0.22034 | 60 |
| Édith Cresson | France | 5/15/1991 | 0.37 | 12 |
| Vassiliki Thanou | Greece | 8/27/2015 | 0.31 | 16 |
| liato Djaló Nandig | Guinea-Bissau1 | 2/10/2012 | 0.66 | 16 |
| Janet Jagan | Guyana1 | 12/6/1997 | 0.80 | 6 |
| Jlaudette Werleigt | Haiti1 | 11/7/1995 | 0.6 | 7 |
| hanna Sigurðardó | Iceland1 | 2/1/2009 | 0.1304 | 24 |
| Indira Gandhi | India1 | 1/24/1966 | 1 | 3 |
| Golda Meir | Israel1 | 3/17/1969 | 1.00 | 4 |
| rdia Simpson-Mill | Jamaica1 | 3/30/2006 | 0.43 | 7 |
| aimdota Straujum | Latvia1 | 1/22/2014 | 0.3 | 12 |
| azimira Prunskien | Lithuania2 | 3/17/1990 | 0.236 | 17 |
| admila Šekerinsk | Macedonia1 | 5/12/2004 | 0.75 | 4 |
| écile Manoroant | Madagascar | 12/18/2009 | 0.389 | 16 |
| Mariam Kalidama | Mali | 4/3/2011 | 0.25 | 12 |
| Natalia Gherman | Moldova1 | 6/22/2015 | 0.21 | 12 |
| yam-Osorvyn Tuye | Mongolia1 | 7/22/1999 | 4 | 21 |
| Luisa Diogo | Mozambique | 2/17/2004 | 1 | 3 |
| aara Kuugongelw | Namibia | 3/21/2015 | 1 | 4 |
| Jenny Shipley | New Zealand | 12/5/1997 | 0.1836 | 36 |
| Sibel Siber | Northern Cyprus | 6/13/2013 | 0.22 | 7 |
| Harlem Brundtla | Norway3 | 2/4/1981 | 0.57 | 8 |
| Benazir Bhutto | Pakistan1 | 12/2/1988 | 0.3 | 11 |
| Hanna Suchocka | Poland3 | 7/11/1992 | 0.5 | 5 |
| Lde Lourdes Pintz | Portugal | 7/1/1979 | 0.125 | 108 |
| athe Uwilingiyima | Rwanda | 7/18/1993 | 0.5 | 3 |
| Maria das Neves | Sao Tome and P | 10/3/2002 | 0.5 | 11 |
| ame Madior Boy | Senegal2 | 3/3/2001 | 0.857 | 6 |
| Alenka Bratušek | Slovenia | 3/20/2013 | 0.5 | 7 |
| Chang Sang | South Korea1 | 7/11/2002 | 0.15 | 31 |
| ngluck Shinawatr | Thailand | 7/3/2011 | 0.13 | 46 |
| la Persad-Bisses | Trinidad and Tob | 5/26/2010 | 0.5 | 7 |
| Tansu Ciller | Turkey | 6/13/1993 | 0.4 | 22 |
| Julia Tymoshenko | Ukraine1 | 1/24/2005 | 0.6 | 10 |
| Margaret Thatcher | United Kingdom1 | 5/4/1979 | 0.148 | 55 |
| Milka Planinc | Yugostavia | 5/16/1982 | 0.2 | 29 |

Question 2: If so, does this left political leaning reflect itself throughout history in the party positions of women world leaders?

Question 2 is contingent on the results of Question 1. Because Question 1 displayed a correlation between predecessor left-wing party leanings and the number of election cycles before a woman takes office (more detail on results and discussion section), Question 2 was conducted.

Data Collection: Political Leanings of Women World Leaders Throughout History

The same list used in Question 1 of all women world leaders who had served, or are serving, the position of prime minister or president of a country was used in Question 2. For each woman, her political party was categorized into left, right, or other leanings.

List 3: Presidents or Prime Ministers

| Name | Type | Country | Date Elected | Left%:x value | Election# :y value |
|--------------------------------|------------------|------------------|--------------|---------------|--------------------|
| Elisabetta Fornero | Prime Minister | Italy | 1/16/2013 | 0.22 | 38 |
| Julia Gillard | Prime Minister | Australia | 6/24/2010 | 0.48 | 27 |
| Barbara Prammer | President | Austria | 7/6/2004 | 0.45 | 10 |
| Cynthia Pratt | Prime Minister | Bahamas | 5/4/2005 | 0.71 | 3 |
| Khaleda Zia | Prime Minister | Bangladesh | 2/27/1991 | 0.56 | 9 |
| Idia Gueiler Tejad | President | Bolivia | 11/16/1979 | 0.08 | 67 |
| Dilma Rousseff | President | Brazil | 1/1/2011 | 0.13 | 36 |
| Reneta Indzhova | Prime Minister | Bulgaria | 10/17/1994 | 0.25 | 44 |
| Kim Campbell | Prime Minister | Canada | 6/25/1993 | 0.42 | 19 |
| Yanayo Bandaranaike | Prime Minister | Ceylon/Sri Lanka | 7/21/1960 | 0.33 | 6 |
| Michelle Bachelet | President | Chile | 3/11/2006 | 0.19 | 35 |
| Laura Chinchilla | President | Costa Rica | 5/8/2010 | 0.27 | 46 |
| Jadranka Kosor | Prime Minister | Croatia | 7/6/2009 | 0.40 | 9 |
| Ulla Thorning-Schmidt | Prime Minister | Denmark | 10/3/2011 | 0.50 | 27 |
| Eleonore Eugenia Charrier | Prime Minister | Dominica | 7/21/1980 | 0.71 | 2 |
| Christiane Bergmann-Pohl | President of the | East Germany | 4/5/1990 | 0.50 | 5 |
| Julia Artega Serra | President | Ecuador | 2/9/1997 | 0.10 | 39 |
| Kersti Kaljulaid | President | Estonia | 10/10/2016 | 0.33 | 5 |
| Tarja Halonen | President | Finland | 3/1/2000 | 0.40 | 11 |
| Edith Cresson | Prime Minister | France | 5/15/1991 | 0.37 | 12 |
| Nino Burjanadze | President | Georgia | 11/23/2003 | 0.66 | 3 |
| Angela Merkel | Chancellor | Germany | 11/22/2005 | 0.38 | 8 |
| Vassiliki Thanou-Christophilou | Prime Minister | Greece | 8/27/2015 | 0.31 | 16 |
| Carmen Pereira | President | Guinea-Bissau | 5/14/1984 | 1.00 | 3 |
| Janet Jagannath | Prime Minister | Guyana | 12/6/1997 | 0.80 | 6 |
| Michelle Pascal-Trouillot | President | Haiti | 3/13/1990 | 0.10 | 37 |
| Indira Gandhi | Prime Minister | India | 1/24/1966 | 1.00 | 3 |
| Wahidjati Sukarnoputri | President | Indonesia | 7/23/2001 | 0.50 | 5 |
| Golda Meir | Prime Minister | Israel | 3/17/1969 | 1.00 | 4 |
| Maria Simpson-Mill | Prime Minister | Jamaica | 3/30/2006 | 0.43 | 7 |
| Atifete Jahjaga | President | Kosovo | 4/7/2011 | 0.6 | 3 |
| Roza Otunbayeva | President | Kyrgyzstan | 4/7/2010 | 0.7 | 5 |
| Valdis Karpulis | President | Latvia | 7/8/1999 | 0.33 | 6 |
| Ellen Johnson Sirleaf | President | Liberia | 9/3/1996 | 0.2173 | 24 |
| Valdas Adamkus | President | Lithuania | 3/17/1990 | 0.236 | 17 |
| Radmila Sekerinska | Prime Minister | Macedonia | 5/12/2004 | 0.75 | 4 |
| Andriamananjato | Prime Minister | Madagascar | 12/18/2009 | 0.389 | 16 |
| Joyce Banda | President | Malawi | 4/7/2012 | 0.66 | 3 |
| Mariam Kaidama | Prime Minister | Mali | 4/3/2011 | 0.25 | 12 |
| Agatha Barbara | President | Malta | 2/15/1982 | 0.66 | 3 |
| Yves Ohsan Bellefleur | President | Mauritius | 3/31/2012 | 0.875 | 5 |
| Zinaida Greceanii | Prime Minister | Moldova | 3/31/2008 | 0.5 | 8 |
| Yam-Osorn Tuya | Prime Minister | Mongolia | 7/22/1999 | 0.4 | 21 |
| Luísa Diogo | Prime Minister | Mozambique | 2/17/2004 | 1 | 3 |
| Sung San Suu Kyi | State Counsellor | Myanmar | 4/6/2016 | 1 | 1 |
| Carolina Beutner | Prime Minister | Namibia | 3/21/2015 | 1 | 4 |
| Jenny Shipley | Prime Minister | New Zealand | 12/5/1997 | 0.1836 | 36 |
| Violeta Chamorro | President | Nicaragua | 4/25/1990 | 0.137 | 32 |
| Sibel Siber | Prime Minister | Northern Cyprus | 6/13/2013 | 0.22 | 7 |
| Harlem Brundage | Prime Minister | Norway | 2/4/1981 | 0.57 | 8 |
| Benazir Bhutto | Prime Minister | Pakistan | 12/2/1988 | 0.3 | 11 |
| Mierya Moscoso | President | Panama | 9/1/1999 | 0.13 | 34 |
| Corazon Aquino | President | Philippines | 2/25/1986 | 0.33 | 11 |
| Hanna Suchocka | Prime Minister | Poland | 7/11/1992 | 0.5 | 5 |
| Amélia de Lourdes Pinto | Prime Minister | Portugal | 7/1/1979 | 0.125 | 108 |
| Pauline Uwilingiyimana | Prime Minister | Rwanda | 7/18/1993 | 0.5 | 3 |
| Maria das Neves | Prime Minister | Sao Tome and P | 10/3/2002 | 0.5 | 11 |
| Fatou Madiou Boye | Prime Minister | Senegal | 3/3/2001 | 0.857 | 6 |
| Jelka Dukić Dejanović | President | Serbia | 4/5/2012 | 0.217 | 17 |
| Iveta Radicová | Prime Minister | Slovakia | 7/8/2010 | 0.2 | 5 |
| Matepe Casaburua | President | South Africa | 9/24/2008 | 1 | 3 |
| Chang Sang | Prime Minister | South Korea | 7/1/2002 | 0.15 | 31 |
| Elisabeth Kopp | Member of the S | Switzerland | 10/21/1984 | 0.086 | 94 |
| Tsai Ing-wen | President | Taiwan | 5/20/2016 | 0.5 | 7 |
| Ingluck Shinawatra | Prime Minister | Thailand | 7/3/2011 | 0.13 | 46 |
| Constance Persad-Bissett | Prime Minister | Trinidad and Tob | 5/26/2010 | 0.5 | 7 |
| Tansu Çiller | Prime Minister | Turkey | 6/13/1993 | 0.4 | 22 |
| Yulia Tymoshenko | Prime Minister | Ukraine | 1/24/2005 | 0.6 | 10 |
| Margaret Thatcher | Prime Minister | United Kingdom | 5/4/1979 | 0.148 | 55 |
| Milka Planinc | Prime Minister | Yugoslavia | 5/16/1982 | 0.2 | 29 |

Testing Process: Chi Squared Test

A Chi Squared Test was conducted to investigate the chi squared null hypothesis: there is no difference between women world leaders throughout history that identify themselves with a right leaning or left leaning party. If the Chi Squared test disproved the null hypothesis, it would show that there is a significant difference in political leanings. If there is a significant difference, there is a clear significant majority party. Since the majority party of women world leaders leans left, a significant difference would show that a left leaning political party is reflected throughout history. For this Chi Squared Test, a p value of 0.05 was used as 0.05 is the most common p value used for research. The degree of freedom will be 1 for this Chi Squared test, because there are two categories (left vs. right) in this test.

Exceptions: There were a few exceptions for data points of women world leaders that were not included in the chi squared test. Women world leaders who did not identify with any party and were considered independent or identi-

fied with any other ideology than left or right, were placed into the other category. Women in the other category were not used for the chi squared test.

Results

Question 1 Result: Yes, there is a correlation between a country's left political leanings and the number of election cycles it takes before a woman occupies the office of prime minister or president. As the percentage of left-leaning predecessors increases, the number of election cycles that pass before a woman world leader takes office decreases.

A Power Regression test was conducted on the data for each of the three lists. The results of the test are shown below in a table with the r-squared value, fitted regression curve, and a graph with the scatterplot of the data and the fitted regression curve.

For all three graphs for Lists 1, 2 and 3, there is a clear downward curve which indicates that as x increases, y decreases. Thus, if any correlation is established at all, it would be reasonable to conclude that as a country's left-wing percentage increases, the number of election cycles it requires before a woman becomes a world leader decreases.

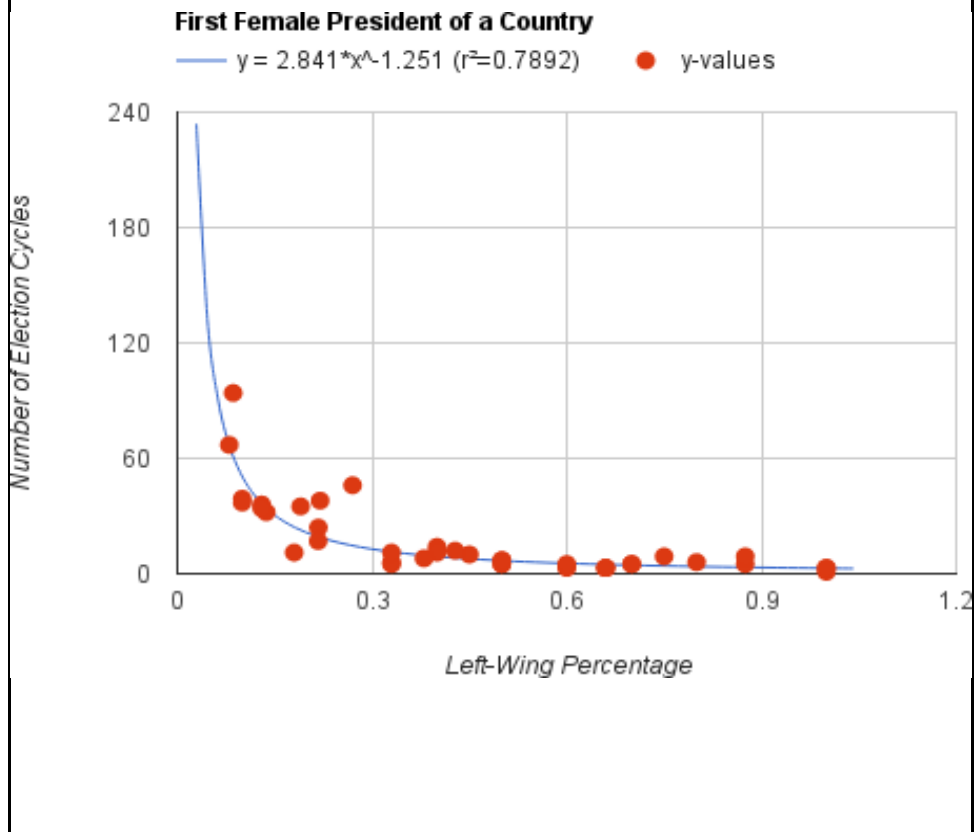
R-squared is the statistical measure of how close the observed data is to the fitted regression curve. R-squared is between 0 and 1.0, and is calculated as a proportion of the variance in the dependent variable that is predictable from the independent variable. The higher the r-squared value is, the better the regression curve correlates to the data points. As a general statistical rule, r values above 0.7 are considered strong correlation and r values below 0.5 are considered weak correlation. Both List 1 and List 3's R-squared values are high, at 0.7892 and 0.7131 respectively. Such high r squared values indicate that both sets of data fit their individual regression lines, and present 2 strong correlations. There exists a strong correlation between the percentage of left leaning predecessors and the number of years it takes before a woman enters the presidency in a country. There also exists a correlation between the percentage of left leaning predecessors and the number of years it takes before a woman enters the presidency or prime minister position in a country. On the other hand, List 2's R-squared value is low, at 0.3986. This indicates that there is a weak correlation, between the percentage of left leaning predecessors and the number of years it takes before a woman enters the prime minister position in a country.

There is a few possible explanations for why List 2: First Female Prime Ministers has such a low correlation. First, prime ministers tend to be voted on by members of the legislature. Members of the legislature are part of a small subset of the population and tend to be highly educated. Higher levels of education have been linked to higher levels of approval of women in politics and lower levels of sexism [11]. Thus, women face less sexist obstacles and are more likely to be accepted into political offices with the legislature voting body. Second, for many countries, prime ministers are appointed by a government official, rather than elected. Again, government officials tend to be more highly educated compared to the rest of the general population, which would make it more likely for prime minister candidates to be judged on objective issues rather than on irrelevant categories such as race and sex. Third, many countries' citizens value the political party of a prime minister candidate more than the prime minister candidate himself or herself [12]. Female prime minister candidates reap the support of their respective party supporters more frequently than female presidential candidates that are part of identity politics systems. Overall, the weak correlation in List 2 supports the trend seen through history that it is far more likely for a women to be prime minister, than president.

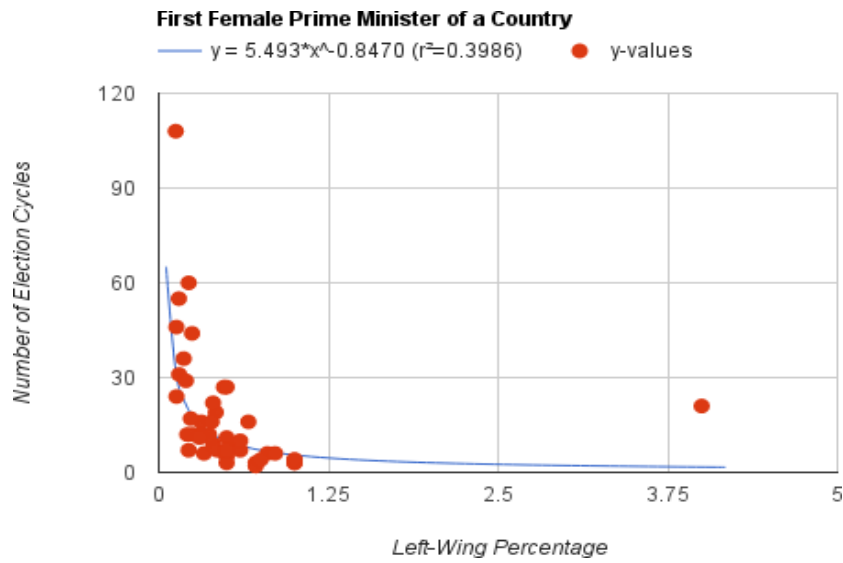
It's important to note that because List 2 has a low correlation, List 2's prime minister data set weakens the data in List 3. Because List 3 is a combination of first prime ministers and presidents, the prime minister data set weakens List 3's overall correlation. Nevertheless, List 3 still has a strong correlation of 0.7131, which supports the correlation between a country's left political leanings and the number of election cycles it takes before a woman occupies the highest political office of a country. Without the data of female prime ministers, the correlation is even higher, as seen in List 1's correlation of 0.7892 which only included female presidents.

| | List 1 | List 2 | List 3 |
|-------------------------|--------------------------------|---------------------------------|--------------------------------|
| R squared value | 0.7892 | 0.3986 | 0.7131 |
| Fitted Regression Curve | -1.251 $y = 2.841 \times x$ | -0.8470 $y = 5.493 \times x$ | -1.282 $y = 2.983 \times x$ |

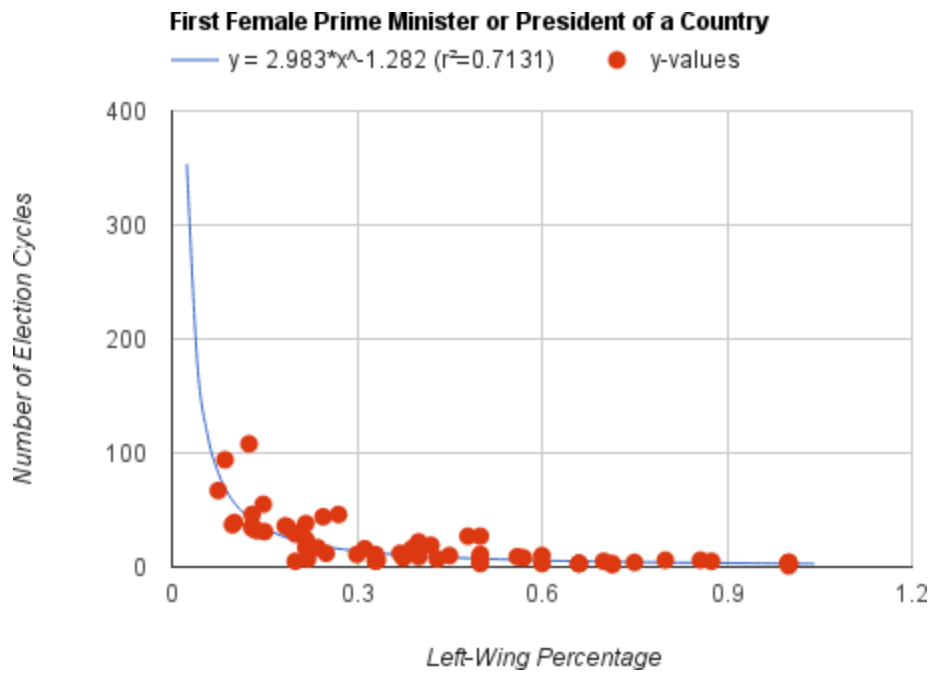
List One



List Two



List Three



Question 2 Result: Yes, left political leaning reflects itself throughout history in the party positions of women world leaders.

A Chi Squared Test was conducted on the data of the political party leanings of all women prime ministers and presidents throughout history. The null hypothesis: there is no difference between women world leaders throughout history that identify themselves with a right leaning or left leaning party, was rejected. The difference between women world leaders who identify themselves with a right leaning party vs. women world leaders who identify themselves with a left leaning party is significant. Since the majority party of women world leaders leans left, a left leaning political party is reflected throughout history.

The data yielded a chi squared statistic of 13.78. In order to reject the null hypothesis with a p value of 0.05 and degree of freedom 1, the chi squared statistic of the data must be greater than 3.84. The chi squared statistic of 13.78 is far greater than 3.84, which rejects the null hypothesis. Thus, the chi squared test is displaying a significant difference between left and right party leanings. Rather than display an insignificant chi squared statistic less than 3.84, the chi squared statistic of 13.78 shows that left political leaning reflects itself throughout history in the party positions of women world leaders.

Discussion

The fact that a greater left-wing predecessor percentage correlates to a shorter number of election cycles before a woman occupies the office of prime minister or president in a country presents important implications.

The data suggests a causative and predictive relationship. First, it supports the theory that a greater presence of left-wing parties causes a women world leader to be appointed more quickly. Under a greater presence of left-wing parties, a country's population will be subject to more progressive policies with an emphasis on equality and government responsibility. With more exposure to progressive policies, one is more likely to be open to the progressive idea of a female president or prime minister as attitudes change over time. Thus, a women world leader would be appointed or elected more quickly than if the country's population had mostly been in a conservative, right-wing party presence. Second, the correlation expresses a predictive relationship for countries who are currently experiencing a majority left-wing presence. Those countries with a majority left-wing presence are more likely to have a female world leader in the near future. On the other hand, majority right-wing presence countries are more likely to have a female world leader farther in the future, unless left-wing leaders begin to be elected or appointed at a faster rate.

Furthermore, even if this study encompassed many different countries from all regions of the world, there was a common correlation of left leaning percentage and number of election cycles between all countries. The correlation comments on the nature of countries' political systems in relation to women's empowerment. A women world leader is not the result of revolutionary, instantaneous, or random change. Instead, it is the result of gradual progress and of years of left-wing political party domination that steadily worked to make the idea of a female world leader more acceptable. However, this is not to say that countries who have just recently become a republic do not have a chance to elect a women world leader in the near future. These recent republics have started at a different playing field than early republics, given that new political systems are generally framed according to the dominant ideologies of a time period [13]. In fact, a point of interest in the data is that countries with recent republics have elected female world leaders relatively faster than countries with early republics.

In order to combat the problem of gender inequality in politics, countries must first understand the problem. By understanding how left-wing party presence faster enables the rise of women world leaders, a clearer pathway is established for more women to become world leaders. With the presence of more women world leaders, women will have a stronger say in domestic and international issues, establishing much needed representation and closing the gender gap in politics. Furthermore, a women world leader can personally advocate for female issues such as birth

control, sexual assault against women, and maternal childcare. When women are empowered, everyone is empowered, through social and economic prosperity [1].

Conclusion

This study ultimately found that a greater left-wing predecessor percentage correlates to a shorter number of election cycles before a woman occupies the office of prime minister or president in a country.

However, even if a correlation was established, there are limitations to the usage of this study's results. First, as pointed out in the exceptions section, countries such as China, Nepal, and Burundi that do not follow a left-wing, right-wing party domination for their prime minister and presidential offices, cannot be considered in this correlation. Furthermore, this study limited itself to the highest political offices of each country. Future research can be conducted with lower levels of political offices, such as province or state level positions. Limiting data to a specific region, with a greater amount of data displaying lower levels of political offices, can show new trends in relationships. The trend of countries with recent republics electing or appointing a female world leader more quickly than countries with earlier republics can be investigated.

Despite limitations, the data in this paper described an important correlation between left leaning political ideologies and women world leaders. As stated in the Discussion, this strong correlation sheds light on a possible causative and predictive relationship between left-wing ideologies and women world leaders, and the nature of political change and systems. Overall, the correlation between political ideologies and women world leaders allows us to gain a deeper understanding of gender inequality in politics. With a deeper understanding of the problem, countries can work to actively combat gender inequality in politics and promote the multitude of social and economic benefits that occur when more women are in political power.

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