

Women's Descriptive Representation and Ratification of International Human Rights, Environmental, and Women's Rights Treaties

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| Abstract |

Even though the influence of women's descriptive representation on domestic politics has been widely studied with the increase in women's participation in politics, the link between women's descriptive representation and the ratification of international treaties has not been thoroughly examined. To fill this research void, this article relying on the Politics of Presence theory and the Critical Mass theory empirically examines the association between women's descriptive representation in parliaments and the number of ratified human rights, environmental, and women's rights international treaties. Based on the time-series cross-national data of 158 countries from 1961 to 2019, this article applying negative binomial regression models demonstrates that countries with a higher percentage of women in parliaments tend to ratify more human rights, environmental, and women's rights international treaties. The empirical results are consistently robust in two-way fixed effects negative binomial models. This study's empirical results contribute to the existing literature on women and politics, and treaty ratification.

Key Words | Women's Descriptive Representation, International Multilateral Treaty, Human Rights Treaty, Environmental Treaty, Women's Rights Treaty

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I. Introduction

Women's participation in politics has increased dramatically in recent decades. According to the Inter-Parliamentary Union (IPU), the global average percentage of women in parliaments has increased to 26.1 percent in 2021. With the pronounced growth of women's presence in parliaments, extensive research has examined various topics related to female representatives, such as the different policy priorities and political attitudes between male and female legislators (Beall and Barnes 2020), the association between gender and issue preferences (Swers 2002), and domestic policy adoption (Htun and Weldon 2012).

Previous efforts to assess female representatives' impacts and their systematic differences from their male counterparts have broadened our understanding of the influence of women's descriptive representation. Regarding female representatives' political attitudes, there is an academic consensus that women representatives are more likely to be politically left and liberal than their male colleagues (Swers 2002). Also, it has been demonstrated that female representatives tend to introduce more bills about women's issues,¹⁾ such as human rights and liberties, women's rights, environmental protection, and violence against women (Atkinson and Windett 2019; Espírito-Santo et al. 2020). Despite mixed empirical results, a series of studies employing both case studies and cross-national approaches provide empirical evidence for the influence of female representatives on policy adoption about women's issues

1) Throughout this article, we define women's issues as those that are "particularly salient to women either because they primarily, directly or disproportionately concern or affect women in particular or because they reflect the more 'traditional' concerns (or interests) that women presumably have about others" (Reingold and Swers 2011, 431).

(Cowell-Meyers and Langbein 2009).

Although the previous literature has broadened our understanding of female representatives in domestic politics, the influence of women in parliaments on countries' international behaviors has not been thoroughly examined. The legislature is an important actor who can approve or veto treaty ratifications, but there are a surprisingly small number of studies that deal in-depth with the link between women's descriptive representation and the countries' ratification of international treaties. Given that unveiling potential factors of the countries' ratification of international treaties is a prerequisite to understanding countries' behaviors and the non-negligible impacts of representatives' gender on political attitudes and policy outcomes, such an academic void is unexpected.

To fill this academic lacuna, this article aims to answer the following research question: does women's presence in parliaments lead countries to ratify international treaties about women's issues? This article contributes to the literature on women in politics by unveiling the role of female representatives in international treaty ratifications. By conducting a time-series cross-national analysis of 158 countries from 1961 to 2019, we applying negative binomial models find that the percentage of women in parliaments is closely related to the number of ratified human rights, environmental, and women's rights international treaties. The empirical results are consistently robust in two-way fixed effects negative binomial models.

The remainder of this article is organized in the following order. In the next section, previous literature on the determinants of international treaty ratifications and the relative marginalization of domestic factors is presented. Then, the potential role that women's descriptive representation in parliaments plays in the ratification of international treaties is introduced, along with

previous studies on the impacts of women's descriptive representation on policy adoption. In the Empirical Analysis section, model specifications, variables and data, and empirical results are presented. Finally, we conclude with a discussion of the results and future research topics.

II. Why Do Countries Ratify International Treaties?

Previous studies investigating countries' reasons and motivations for ratifying treaties have focused on international factors. Realists have argued that the influence of great powers determines other countries' ratifications. Countries tend to ratify a treaty following a powerful country that has committed to the treaty (Perrin and Bernauer 2010). Yamagata et al. (2017) explored the relationship between state power and emulation, focusing on environmental treaties. Especially during the Cold War era, when the bipolar system shaped the international order, countries ratified a treaty if the USA or the USSR first ratified it. Other studies found that the pressure from import-trade partners with a high level of human rights standards can also make exporting countries ratify treaties and adopt international norms (Cao 2012; Greenhill et al. 2009).

Countries also voluntarily join international treaties because they do not want to remain aloof from multilateral treaties that most of their peers have ratified. As more countries—especially regional peers—commit to international agreements, it becomes more difficult to justify remaining not ratified (Simmons 2009). Many studies have found that countries are likely to emulate their neighbors, economic, religious, or language peers, and diplomatic partners (Yamagata et al. 2017; Neumayer 2002).

Other research, based on a constructivist perspective, has demonstrated that international organizations “teach” countries about norms. Countries’ institutional and policy innovations are the consequence of learning from international organizations rather than the product of states’ inherent characteristics or domestic needs (Finnemore 1993). Research reveals that international treaty participation is related to the role of international nongovernmental organizations (INGOs) and epistemic communities rather than governments (Kim 2013; Longhofer et al. 2016). Bernauer et al. (2010) demonstrated that countries that actively participate in international organizations are more likely to join international agreements, and Roberts et al. (2004) argued that the number of NGOs in a nation is closely related to its likelihood to participate in international treaties.

Although international factors and rationale can be important for understanding why a country’s decision-makers join a treaty, we should not neglect domestic factors that affect countries’ decisions to sign and ratify international treaties. Many studies on international treaties have investigated countries’ reasons for and motives for signing and adopting treaties, mostly focusing on the intrastate rationale behind joining a treaty. The realists have focused on the costs and benefits of countries’ treaty ratification, arguing that countries join treaties that meet their needs or maximize their benefits. Although the realist explanation is useful to understand countries’ decision to join security (Kinne 2018) or economic treaties (Poulsen 2014), it hardly explains why countries ratify human rights treaties including women’s rights treaties, or environmental treaties where benefits and interests are not obvious and immediate.

Political institutions have also been considered the main determinant of countries’ treaty ratifications, although the findings are mixed. Some argue that

democratic countries are more likely to sign and ratify international agreements (Congleton 1992; Mansfield and Pevehouse 2006). Democratic countries especially support human rights-related treaties, as they reflect the values of civil and political liberties, equal opportunity, and the individual rights that the democratic system is based on. Those countries anticipate that they will be able and willing to comply with these treaties under most circumstances (Simmons 2009). Some research emphasizes the salient trend of many signings and ratifications by democratizing countries and young democracies (Landman 2005; Simmons 2009). Democratizing countries tend to join international organizations (IOs) because joining an IO can help leaders in transitional states credibly commit to carrying out democratic reforms and can reduce the probability of backsliding to authoritarianism (Moravcsik 2000).

Although previous studies on the countries' joining to international treaties have provided various explanations of international factors or domestic motivations, they have failed to explain which domestic actors or institutions affect the ratifications and how they create the variation of ratification across countries. In particular, there has been a lack of research on the effect of the legislative branches' gendered composition on treaty ratification, even though the legislature is the institution that could approve or veto international treaties' ratification and although the non-negligible impacts of representatives' gender on political attitudes policy outcomes have been widely examined. Therefore, this study focusing on women's descriptive representation aims to find out how the gendered composition of legislative branches affects the number of ratified treaties.

III. Women's Descriptive Representation and International Treaty Ratification

Although the signature of international treaties is mainly decided by the government, a signature itself does not make the country a party to a treaty. In order to become a party to an international treaty, it is necessary to express its willingness to fulfill the legal rights and obligations written in the treaty (United Nations 2012). A country expresses its consent to be bound by the treaty through ratification, which is impossible without the support of the legislature in most countries including both democratic and non-democratic countries.

Given that the international treaty ratification process largely mirrors the domestic lawmaking process in most countries, a mechanism that explains the effect of women's representation on domestic legislation could possibly be extended to international lawmaking through treaty ratification. Based on the literature that finds the relationship between a higher percentage of women in parliaments tends to result in women-friendly policy adoptions (Courtemanche and Green 2017; Tam 2017), this study argues that gender effect also exists in the process of international treaty ratification.

Thomas and Welch (1991) unveiled the association between women's descriptive representation and pro-women policies by surveying members of the lower houses of state legislatures in the United States. Furthermore, considering a two-stage process, Caiazza (2004) found that a more descriptive representation of women tends to entail the adoption of women-friendly policies regardless of the female representatives' individual partisanship. More recently, based on a fifty-state dataset from 1999 to 2009 in the United States, Courtemanche and Green (2017) demonstrated that states' spending related to health care for poor

children, the disabled, and elders is positively associated with the percentage of women in legislatures.

Related to other countries' contexts, Bratton and Ray (2002) found that a more descriptive representation of women-led Norwegian municipalities provides more comprehensive childcare. Kittilson (2006) showed that an increase in elected women officials had a substantially positive influence on the adoption of maternity and childcare leave policies, based on the analysis of Western European countries. Furthermore, case studies of nondemocratic and less economically developed countries support the substantial influence of women's descriptive representation. Wang (2013) investigating the Ugandan parliament, demonstrated that the presence of women representatives advanced women's issues including the environment and human rights. Also, Tam (2017) also showed that Hong Kong's female legislators are more likely to represent women's interests than male legislators are.

In addition to the influence of gender on political attitudes toward feminist policies, previous literature on environmental politics has also demonstrated that gender is one of the most important factors determining political attitudes and priorities toward green issues (Ramstetter and Habersack 2019; Sundström and McCright 2016). While Sundström and McCright (2016) provided empirical evidence that female legislators are more likely to support pro-environmental policies, Ramstetter and Habersack (2019) using data on roll call voting in European Parliament showed that female representatives tend to vote for policies to protect the environment. Moreover, some studies have demonstrated that women at both citizen-level and elite-level are more likely to care about human rights than men are (Forman-Rabinovici and Sommer 2019).

The impact of women's descriptive representation on the ratification of

international treaties can be explained by psychological development theory and the Critical Mass theory. Firstly, male and female representatives tend to have different life experiences because of their gender, which generates different inner-value systems (Gilligan 1982). In particular, Gilligan's (1982) Ethics of Care theory explains that women tend to pay more attention to human rights, environmental policies, and women's rights because they have been taught to pursue empathy, compassion, and morality since childhood. The large proportion of female legislators increases the likelihood of the adoption of domestic policies that are related to human rights and environmental policies because female representatives are more likely to discuss morality and ethics than their male colleagues (Allik 2016).

Secondly, when there is a small number of female representatives, their voices are likely to be criticized and ignored by their male counterparts. When women are marginalized in politics, it generates a vicious cycle under which women's ability to rule has been questioned; women remain in the marginalized status in politics and, thus, women's interests and women's issues cannot be represented in policy outcomes (Phillips 1995). Kanter (1977) argued through the Critical Mass theory that female representatives have difficulty changing policy areas until they overcome their token status. When the percentage of women in parliaments is below fifteen percent, the legislative body is a skewed body in which the minority group is dominated by the majority. In this case, female representatives are in token status under which conditions the topics of women's interests and issues, such as human rights and environmental issues, are likely to be criticized and ignored.

Therefore, a certain level of female representatives in parliaments is a prerequisite for them to have a substantial voice in the policy-making process

(Kanter 1977). The entrance of women into politics through enabling devices, including funding for potential women candidates can reduce the barriers to political entry for women and result in the adoption of women-friendly policies (Mansbridge 1999). In particular, the critical mass of female representatives leads women in legislatures to pursue women's political agendas including both human rights and women's rights, and pro-environmental policies (Forman-Rabinovici and Sommer 2019).

We expect that the effect of gender on international treaty ratification will be similar to the effect on domestic lawmaking and policy adoption concerning human rights, the environment, and women's rights because the vast majority of countries provide international treaty ratification processes that reflect the domestic lawmaking processes in their constitutions (Hathaway 2008). One hundred and twenty-four countries have voting thresholds in the legislature for treaty ratifications that are the same as those for domestic laws (Hathaway 2008). Although in about twenty percent of countries the legislature is not directly involved in international lawmaking, the vast majority of countries stipulate that the treaty can be ratified only with the consent of a majority (or two-thirds) of the parliament. They include most democratic countries, many electoral authoritarian regimes like Russia, Iraq, Venezuela, Ecuador, Algeria, and Nigeria, and even some full autocracies such as China, Iran, Syria, and Kuwait.

Moreover, passing a bill for international treaty ratification could be a great long-term strategy for female representatives who may have struggled to suggest and adopt domestic policies for human rights, the environment, and women's rights. Before undertaking the treaty's legal obligations at the international level, countries prepare themselves as members of the treaty by enacting the legislation

necessary to implement the treaty domestically. The series of efforts that countries make to meet global standards will help female representatives bring up and pass domestic policies related to the issue of the treaty.

Based on this logic, we tested three hypotheses about the influence that women's descriptive representation has on the ratification of human rights, the environment, and international treaties, which previous studies classified as women's issues.

- Hypothesis 1: Countries with a greater level of women's descriptive representation tend to ratify a higher number of human rights treaties.
- Hypothesis 2: Countries with a greater level of women's descriptive representation tend to ratify a higher number of environmental treaties.
- Hypothesis 3: Countries with a greater level of women's descriptive representation tend to ratify a higher number of women's treaties.

IV. Empirical Analysis

To test the influence that women's descriptive representation has on international treaty ratification, we conducted a time-series cross-national analysis based on data from 158 countries from 1961 to 2019. It should be noted that the country and time coverages of data are based on data sources including the United Nations Treaty Series (UNTS), the Variety of Democracy (V-Dem) dataset (Coppedge et al. 2019), and the Quality of Government dataset (Teorell et al. 2010). Using panel data allows us not merely to control unobserved individual countries' heterogeneities but also to make causal inferences because

individual countries were observed repeatedly (Best and Wolf 2014). Moreover, the broad coverage of the number of countries is conducive to assessing the generalizability of the empirical results.

1. Variables and Data

Dependent Variables

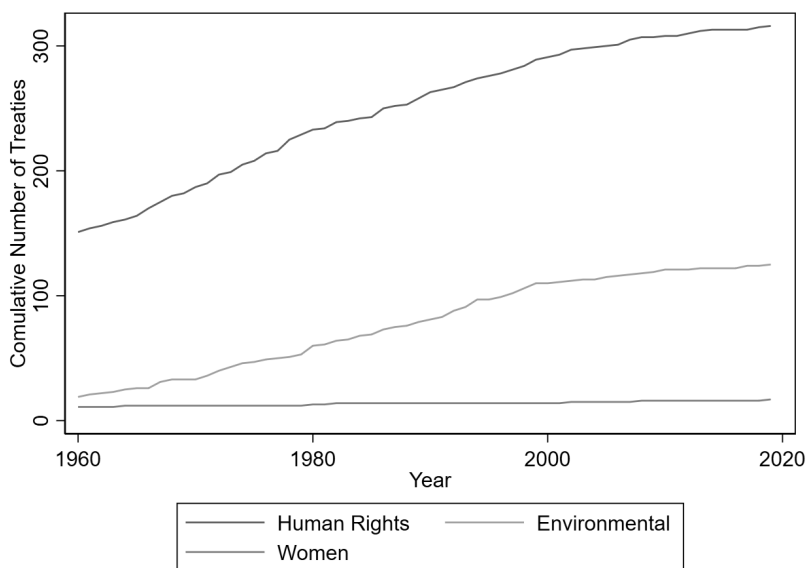
The dependent variables of this research were the number of ratified international treaties according to three issues: human rights, the environment, and women's rights. To build the dependent variables, we used the open multilateral treaties²⁾ data from the United Nation Treaty Series (UNTS), which includes all international agreements registered or filed and recorded by the secretariat from 1945 to 2019 and all League of Nations treaties. The data do not include regional multilateral treaties.

UNTS data include information on each treaty's "subject terms," which tags up to ten issue areas to which the treaty belongs (e.g., *commodity, finance, human rights, women, the sea, whaling, friendship, cultural matters*, etc.). If a treaty had the subject term women, it is classified as a women's treaty. A treaty with the following subject terms is classified as a human rights treaty: *human, rescue, refugee, asylum, women, children/minors/youth, labor, health, civil matters*, and social matters. Thus, human rights treaties include women's treaties. Finally, the treaty with the words environment, pollution, wildlife, animals, plants or whaling, resources, fishing, forestry, or energy in the title or

2) Open multilateral treaties are those that are open to all countries worldwide or to all countries in a particular region.

subject terms was coded as an environmental treaty.

<Figure 1> Cumulative Number of International Treaties by Issue



<Figure 1> shows the cumulative number of international treaties for three issues: human rights, the environment, and women's rights. Even though there have been only slight changes in the number of international women's treaties, the cumulative number of international treaties for all three issues has shown an increasing tendency in recent decades. In our data, 316 human rights treaties, 125 environmental treaties, and 17 women's rights treaties were included. The treaties classified as human rights treaties include the Convention on the Rights of Persons with Disabilities and the International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families; the

environmental treaties include the Paris Agreement, and the Statute of the International Renewable Energy Agency (IRENA). Also, women's rights treaties include the Convention on the Political Rights of Women, the Convention on the Elimination of All Forms of Discrimination Against Women, and so on.

Countries can sign and ratify international treaties, and these two actions have different effects. A signatory does not become a member of a treaty through a signature alone unless the treaty stipulates otherwise. To become a party to a treaty, an entity must express its consent to be bound to the treaty (i.e., ratification) by demonstrating its willingness to undertake the legal rights and obligations addressed in the treaty (Baccini and Urpelainen 2014). A country can ratify a treaty after its approval has been granted through internal governmental procedures, usually congressional approval. Thus, this article used the number of cumulative ratified international treaties according to the three issues as dependent variables. Whenever countries withdrew, this was reflected in each dependent variable.

Independent Variable

As a key independent variable to operationalize women's descriptive representation, the percentage of female representatives in parliaments based on the Parline Global Data on National Parliament developed by the IPU was employed. By tracking the results of elections, the IPU's historical dataset provides information about the percentage of women in parliaments in countries. The percentage of women in parliaments is lagged by one year, given that political factors do not usually tend to be translated into policy changes within a year (Woo 2021). Moreover, the inclusion of the lagged independent variable enables us to parcel out the potential endogeneity problems caused by reserve

causality and simultaneity in panel data models (Reed 2015).

Control Variables

Including appropriate lists of control variables should precede the empirical analysis because omitting relevant variables may bias the estimates and prevent us from unveiling the independent influence that women's descriptive representation has on international treaty ratifications. Thus, this article encompasses a series of domestic and international control variables that have been studied as potential factors in the ratification of international treaties based on a thorough literature review on this topic.

As one of the domestic control variables, logged GDP per capita is included to parcel out the influence of economic development on the ratification of international treaties about human rights, the environment, and women's rights. Countries' level of development has been recognized as a key domestic factor for them to ratify treaties (Waltz 1979). A branch of modernization theory argues that economically developed countries tend to pursue more progressive or post-material values, including human integrity and rights, self-expression, and freedom (Inglehart 1981). On the contrary, economically less developed countries emphasize basic human needs, survival, and other materialistic values. Given that previous literature has supported the association between economic development and the ratification of human rights, environmental, and women's rights treaties (Wotipka and Tsutsui 2008), we expected that logged GDP per capita would have a positive impact on the dependent variable.

Considering the domestic regime type is essential to understanding the reasons behind individual countries' international legal commitments (Slaughter 1995). The levels of democracy have been examined in previous studies as a

determinant of treaty ratifications (Elsig et al. 2011). In particular, many studies have shown a robust relationship between the levels of democracy and the ratification of human rights, women's rights, and environmental in the rate of treaty ratification between democratic and non-democratic countries (Hafner-Burton et al. 2008). Rather than disregarding the potential positive impact of democracy, we included the level of democracy as a control variable. Given that the Polity Score and Freedom House Index have been criticized because of their underestimation or overestimation of the democracy level, we used the Polyarchy Index from the V-Dem dataset to measure the democracy levels of countries.

In addition, some argue that newly democratized countries are more likely to ratify multilateral treaties to address domestic credibility problems and nondemocratic political threats (Mansfield and Pevehouse 2006). Based on the cross-national data presented in Boix, Miller, and Rosato (2013), defining a democratic country as a country with popular elections, free and fair elections, and universal suffrage, we assigned 1 to a country-year observation until three years after democratization; otherwise, 0 was assigned.

Moreover, for our study, government ideology is considered one of the control variables. Based on the traditional left/right political dimensions, both previous single case studies and cross-national analyzes provide empirical support for the significant influence that left-wing governments and political parties have on policy agendas promoting human or women's rights and protecting the environment (Dahlerup and Leyenaar 2013). Even though some studies show that the association between government ideology and policy outcomes is weak or insignificant (Htun and Weldon 2012), we included *Left Government* in the empirical models to control the potential positive influence that left governments

have on treaty ratifications rather than risk committing omitted variable bias. Based on the variable *dpi_gprlc1* in the Quality of Government dataset, we assigned 1 if the largest government party was left-oriented.

We control the influence of individual countries' geopolitical regions by including regional dummy variables. Including these regional dummies also allowed us to control for additional unobserved regional effects on countries' likelihood of ratifying international treaties. For instance, the influence of regional norms concerning human rights, the environment, and women's rights will be parceled out due to the use of regional dummy variables. Based on the classification from the Quality of Government dataset, Geopolitical regions are classified into ten categories: Eastern Europe and post-Soviet Union, Latin America, North Africa, the Middle East, Sub-Saharan Africa, Western Europe, North America, East Asia, South-East Asia, South Asia, the Pacific, and the Caribbean.

A series of international factors have been examined as determinants of international treaty ratifications. First, the existence of domestic or international conflicts in a country is included because some previous studies have demonstrated or indirectly suggested the negative impacts that countries' involvement in international conflicts or civil war has on participation in international communities (Poe et al. 1999). By using data (*e_miinteco* and *e_miinetrc*) from the V-Dem dataset, we assigned 1 to the country-year observation when a country was involved in armed international or internal conflicts; otherwise, 0 was assigned.

It is also important to consider the negative influence of the Cold War on the ratification of international treaties. The Cold War has been regarded as a hindrance for individual countries to join international treaties aiming to improve

human and women's rights and lessen environmental issues (Clark 2010). During the Cold War era, when inter-state conflicts were highly ideological and influenced by superpowers (Cole 2005), international instruments pursuing basic human dignity and protection of the environment were paralyzed or slowed (Donnelly and Whelan 2020). Conversely, some scholars have argued that the Cold War ironically created global norms about human integrity and elevated the status of human rights rhetoric, as the two superpowers employed human rights norms for their political goals (Buergethal 1997). Thus, rather than leaving this controversial variable out, the Cold War binary variable was used to control for the Cold War's positive or negative influence. We assigned 1 for the Cold War era (1965–1989) and 0 otherwise.

Trade openness has also been regarded as one of the possible factors in ratifying international treaties because countries economically integrated into the world economy have an incentive to take a cooperative stance and ratify multilateral treaties to enlarge future trade opportunities (Neumayer 2002). While some studies have demonstrated the non-negligible positive impacts of trade openness (Perrin and Bernauer 2010), others have found no substantial influence of trade openness on the number of international treaty ratifications (Spilker and Koubi 2016). With the chance of omitted variable bias, we controlled for trade openness. As a proxy for trade openness, this article relies on one of the most frequently employed proxy measures: the sum of exports and imports divided by the GDP (*Trade % GDP*) from the World Development Indicators (WDI).

International autonomy, defined as no external actor having authority within the limits of the state (Krasner 1995, 116), has also been examined as a factor affecting individual countries' ratification of international treaties (Hafner-Burton

et al. 2008). We controlled for individual countries' international autonomy based on a variable named *v2svinlaut* in the V-Dem dataset.³⁾

The international nongovernmental organization (INGO) leadership of a country is also controlled. Previous research has demonstrated that international treaty participation is related to the roles of INGOs (Longhofer et al. 2016). INGOs empower local actors and push governments to meet social demands and maintain political legitimacy (Kim, 2013); thus, the number of INGOs in a country is an important factor that affects the likelihood of a country's participation in international treaties. If a country has many INGO headquarters, the government is likely to feel more pressure to cooperate with international treaties. For this variable, we used data scraped from the United Nations Civil Society (UNCS) by Ryu (2020). This variable counts the number of INGO headquarters with consultative status in the UN Economic and Social Council (ECOSOC).

〈Table 1〉 Descriptive Statistics

Variable	Type	Obs.	Mean	Std. Dev.
Dependent Variables				
The Number of Ratified Human Rights Treaties	Count	8,306	66.888	38.361
The Number of Ratified Environmental Treaties	Count	8,306	17.777	15.276
The Number of Ratified Women Rights Treaties	Count	8,306	5.173	2.996
Independent Variables				
Women in Parliament (%)	Continuous	8,306	8.370	10.153
Domestic Control Variables				
Ln (GDP per capita)	Continuous	8,306	4.898	12.305
Democracy	Continuous	8,306	0.441	0.290

3) V-Dem uses latent variable analysis via the Bayesian item response theory measurement model to build comparable cross-national measurements of international autonomy. See Pemstein et al. (2018) for detailed information about V-Dem's measurement model.

Variable	Type	Obs.	Mean	Std. Dev.
Democratic Transition	Binary	8,306	0.033	0.179
Left Government	Binary	8,306	0.053	0.223
Regional Dummies				
Eastern Europe and Post-Soviet Union	Binary	8,306	0.108	0.310
Latin America	Binary	8,306	0.146	0.353
North Africa and the Middle East	Binary	8,306	0.130	0.336
Sub-Saharan Africa	Binary	8,306	0.293	0.455
Western Europe and North America	Binary	8,306	0.166	0.372
East Asia	Binary	8,306	0.029	0.169
South-East Asia	Binary	8,306	0.065	0.247
South Asia	Binary	8,306	0.042	0.202
The Caribbean	Binary	8,306	0.021	0.142
International Control Variables				
Conflict	Binary	8,306	0.103	0.304
Cold War	Binary	8,306	0.419	0.493
Trade (% GDP)	Continuous	8,306	75.830	74.668
International Autonomy	Continuous	8,306	1.108	0.768
Ln (Number of INGO headquarters)	Continuous	8,306	0.463	1.005

Note: The regional dummy for the Pacific countries was not included because no countries in the Pacific regions were included in the final dataset.

<Table 1> shows the descriptive statistics of all the variables employed in our empirical analysis. To assess whether there are multicollinearities among the independent and control variables, we conducted a variance inflation factor (VIF) test. The mean VIFs are less than 2 and individual VIFs corresponding to each independent and control variable are not exceed 4, showing that there are no problematic correlations among the variables.

1. Empirical Results

Applying ordinary least squares (OLS) regressions on a count dependent variable is problematic because coefficient estimates will be biased, corresponding estimates of standard errors will be invalid, and predictions will be non-sensical. In turn, the use of OLS regressions with a count dependent variable prevents us from properly discussing empirical results and implications. Thus, given our dependent variables, we employed negative binomial regressions to test our hypotheses.

〈Table 2〉 Estimations from Negative Binomial Regression Models

	Model 1	Model 2	Model 3
	Human Rights	Environmental	Women Rights
Independent Variable			
Women in Parliament (%)	0.004*** (0.000)	0.005*** (0.000)	0.008*** (0.000)
Domestic Control Variables			
Ln (GDP per capita)	0.106*** (0.005)	0.176*** (0.006)	0.099*** (0.007)
Democracy	0.157*** (0.015)	0.407*** (0.019)	0.061*** (0.019)
Democratic Transition	0.005 (0.013)	0.017 (0.015)	0.009 (0.017)
Left Government	0.021*** (0.006)	0.042** (0.016)	0.051*** (0.007)
International Control Variables			
Conflict	-0.007 (0.010)	-0.023 (0.014)	-0.026* (0.013)
Cold War	0.639***	2.008***	0.470***

	Model 1	Model 2	Model 3
	Human Rights	Environmental	Women Rights
	(0.037)	(0.055)	(0.045)
Trade (% GDP)	-0.001	0.000	0.000
	(0.001)	(0.000)	(0.000)
International Autonomy	0.078***	0.064***	0.090***
	(0.005)	(0.006)	(0.006)
Ln (number of INGO headquarters)	0.053***	0.072***	0.054***
	(0.004)	(0.004)	(0.007)
Regional Dummy Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Constant	2.681***	-0.805***	0.558***
	(0.055)	(0.072)	(0.073)
Number of Obs	8306	8306	8306
Wald Chi2	30856.265	69762.630	9905.931
Pseudo R2	0.094	0.213	0.091
AIC	141917.808	96078.212	71550.658
BIC	142483.493	96643.897	72116.343

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors are in parentheses. The Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) are presented for model comparison.

<Table 2> shows the estimations from the negative binomial regression models. As expected, the independent variable, *Women in Parliament (%)*, is statistically significant at the level of $p < 0.001$ across the three models. In Model 1, the coefficient of *Women in Parliament (%)* is 0.004, so the expected log count of the number of ratified human rights treaties increases by 0.004 for each 1 percent increase. In terms of the expected log count, the coefficient of the independent variable is the highest in Model 3, where the number of ratified

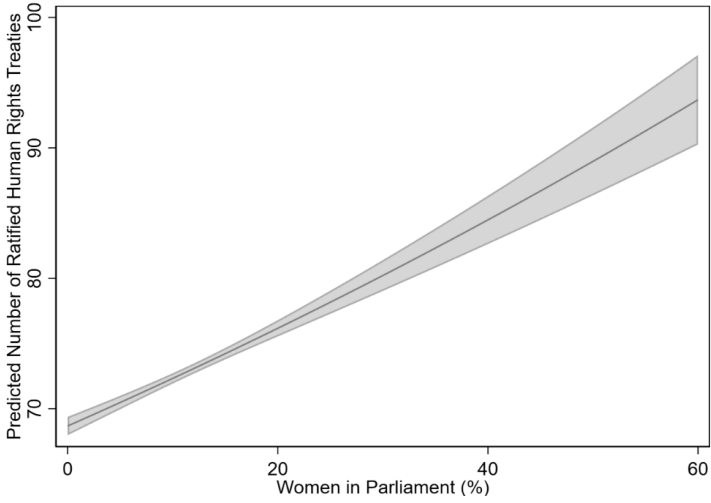
women's rights treaties is the dependent variable. The empirical results concerning the percentage of women in parliaments are consistent in bivariate models estimated without control variables (see Table A.1 in Appendix).

Turning to the control variables, we found that $\ln(GDP\ per\ capita)$ has statistically significant positive relationships with the three dependent variables as expected. Countries with higher levels of democracy tend to ratify more international human rights, environmental, and women's rights treaties, which provides additional empirical evidence for the argument that democratic countries are more likely to join these international treaties. Also, consistent with previous research, our study reveals that countries led by left-wing governments tend to show more commitment to the three issues of international treaties.

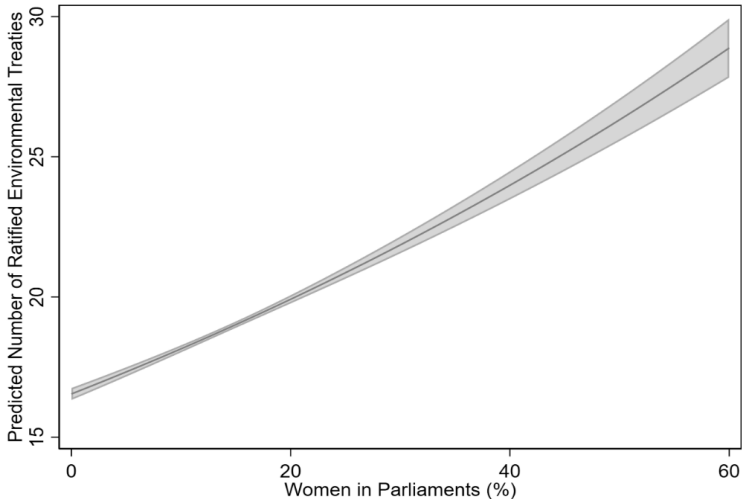
Among the international control variables, Table 2 shows that the *Cold War* had a positive impact on the number of ratified international treaties. The relationship might reflect the situation during the Cold war when two super powers competitively introduce treaties and norm (Simmons 2009) and countries tended to join more international treaties by following the superpower they allied with (Yamata et al. 2017). Also, *International Autonomy* shows a statistically significant relationship with the three dependent variables at the level of $p < 0.001$. This finding buttresses previous findings that the degree of international autonomy might influence motivations toward and behaviors regarding international treaty ratification. The logged number of INGO headquarters had statistically significant relationships with the three dependent variables. It demonstrates the non-negligible impacts of INGO on international treaty participation. Despite differences in the estimated coefficients, the empirical results related to both independent and control variables are robust in OLS regression models (see Table A.2. in Appendix).

〈Figure 2〉 Predicted Number of Ratified Treaties

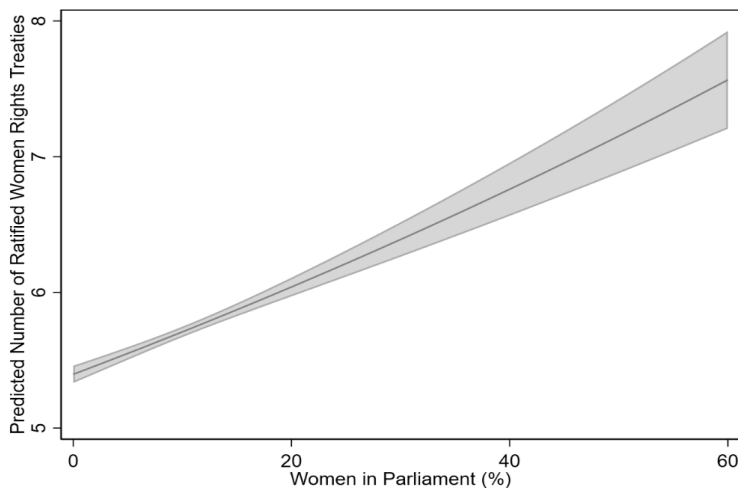
(A) Number of Ratified Human Rights Treaties



(B) Number of Ratified Environmental Treaties



(C) Number of Ratified Women Rights Treaties



Note: The predicted numbers were estimated while all other variables were held at their observed values. The gray area represents 95 percent confidence intervals.

Next, to evaluate the substantive effects of women's descriptive representation in legislative branches on the number of ratified treaties, we estimated the predicted number of ratified treaties by issue areas. Figure 2 presents the predicted numbers of ratified human rights, environmental, and women's rights international treaties. This demonstrates that the influence of women's descriptive representation in parliaments is not only statistically significant but also substantively significant. Panel (A) in Figure 2 shows the predicted number of ratified human rights treaties according to the increase in *Women in Parliament (%)*. When the percentage of women representatives in legislative branches is 0, the predicted number of ratified human rights treaties is around 68.676. The predicted number increases to 76.168 when the percentage reaches 20 percent. If legislative branches are composed of 50 percent women, the

predicted number exceeds 88.966.

Such a substantial impact of women's descriptive representation in parliaments is also observed in Panel (B), where the number of ratified environmental treaties is predicted. In Panel (B), the predicted number increases from 16.540 to 21.856 when the percentage of women legislators increases from 0 percent to 30 percent. Related to the number of ratified women's rights treaties shown in Panel (C), when *Women in Parliament (%)* increases from 0 percent to 30 percent, the predicted number increases from 5.396 to 6.390. Even though the impact that women's descriptive representation in parliaments has on the predicted number of ratified women's rights treaties is smaller, it is still substantively significant given that the ratification of women's rights treaties is a rare event.

〈Table 3〉 Average Marginal Effects of Women's Descriptive Representation in Parliaments

Model	dy/dx	std. err.	z	p > z	[95% Conf. Interval]	
Model 1	0.377	0.028	13.53	0.000	0.323	0.432
Model 2	0.176	0.008	22.95	0.000	0.161	0.191
Model 3	0.032	0.003	11.64	0.000	0.027	0.038

Note: Average marginal effects (AMEs) were estimated while all other variables held their observed values.

We estimated the average marginal effects (AMEs) of *Women in Parliament (%)* in addition to the estimations of the predicted number of ratified treaties. Estimating the average marginal effects along with predicted probabilities enables us to properly understand the substantial influence of the percentage of women in parliaments on the number of ratified treaties. As demonstrated in

Table 3, the AMEs of the independent variable in the three models are statistically significant at the level of $p < 0.001$. The AME in Model 1, Model 2, and Model 3 is 0.377, 0.176, and 0.032, respectively, meaning that a 1 percent increase in *Women in Parliament (%)* increases the number of treaties according to each issue by 0.377, 0.176, and 0.032, respectively. To sum up, the empirical results presented in Table 2, Figure 2, and Table 3, the influence of the percentage of women in parliaments on the number of ratified treaties is not merely statistically significant but also substantially meaningful.

Checking the robustness of the empirical results in different model specifications is an important step in accumulating scientific knowledge. Thus, rather than concluding only with the empirical results, we conduct a robustness check using two-way fixed effects (country and year fixed effects) negative binomial models. The inclusion of country fixed effects along with year fixed effects enables us to parcel out the influence of unmeasured and unobserved factors varying across the country and over time, and idiosyncratic countries' features such as electoral systems and procedures of treaty ratification of each country, culture, and religion. Although the use of country fixed effects leads to variance reduction, the addition of country fixed effects makes it possible to control between-unit variations and, in turn, to estimate explanatory variables' average effect within countries (Wooldridge 2010). Moreover, we include a lagged dependent variable as an additional control to handle the potential autocorrelation in the residuals which can cause bias in estimates of coefficients.

〈Table 4〉 Estimations from Two-Way Fixed Effects Negative Binomial Regression Models

	Model 4	Model 5	Model 6
	Human Rights	Environmental	Women Rights
Independent Variable			
Women in Parliament (%)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)
Domestic Control Variables			
Ln (GDP per capita)	0.054*** (0.004)	0.064*** (0.008)	0.042*** (0.006)
Democracy	0.049*** (0.006)	0.303*** (0.010)	0.002*** (0.000)
Democratic Transition	0.012 (0.015)	0.009 (0.008)	0.014 (0.007)
Left Government	0.002*** (0.000)	0.004** (0.001)	0.004*** (0.000)
Lagged Number of Ratified Treaties	0.013*** (0.000)	0.031*** (0.000)	0.177*** (0.001)
International Control Variables			
Conflict	-0.002 (0.004)	-0.046 (0.034)	-0.038*** (0.005)
Cold War	0.229*** (0.025)	1.705*** (0.061)	0.091*** (0.023)
Trade (% GDP)	-0.001 (0.002)	0.000 (0.000)	0.001 (0.001)
International Autonomy	0.030***	0.050***	0.004***

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	Model 4	Model 5	Model 6
	Human Rights	Environmental	Women Rights
	(0.002)	(0.004)	(0.001)
Ln (number of INGO headquarters)	0.031***	0.008***	0.035***
	(0.002)	(0.002)	(0.002)
Regional Dummy Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Constant	2.681***	-0.805***	0.558***
	(0.055)	(0.072)	(0.073)
Number of Obs	8306	8306	8306
Wald Chi2	83771.742	147192.215	75599.922
Pseudo R2	0.240	0.308	0.284
AIC	117993.443	83916.914	55879.451
BIC	118566.138	84489.609	56444.510

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors are in parentheses. The AIC and BIC are presented for model comparison. The *Lagged number of ratified treaties* is the lagged number of ratified human rights treaties in Model 4, the lagged number of ratified environmental treaties in Model 5, and the lagged number of ratified women rights treaties in Model 6

Table 4 presents the results from two-way fixed effects negative binomial models with a lagged dependent variable. As presented, even though the estimated coefficients of *Women in Parliament (%)* decrease due to the inclusion of country fixed effects and a lagged dependent variable, the estimated coefficients of *Women in Parliament (%)* across the three models are statistically significant at the level of $p < 0.001$ with positive directions. Models estimated

in Table 3 have lower AICs and BICs compared to those in Table 2, meaning that models in Table 3 have better model-fits.

The empirical results provide additional support for our argument that the number of ratified human rights, environmental, and women's rights treaties increases with the emergence of female legislators. Even not presented because of the page limit, the influence of women's descriptive representation is substantially significant in terms of the predicted number of ratified treaties by issue areas and AMEs. Related to control variables, the significance and signs of the estimated coefficients are also similar to those presented in Table 2. Moreover, even after we estimate the two-way fixed effects model with the number of ratified human rights treaties except for women's rights treaties, the influence of women's descriptive representation is statistically and substantially significant.

V. Conclusion

The empirical results from the time-series cross-national analysis with data on 158 countries from 1961 to 2019 posit that women's descriptive representation has an important role in the ratification of international human rights, environmental, and women's rights treaties. Even after controlling for domestic and international factors that affect the ratification of international treaties, countries with parliaments that have a high percentage of women tend to join more international treaties related to these three issues.

The findings from this article contribute to the literature on women and politics by providing robust empirical evidence supporting the meaningful

influence of women's descriptive representation on the ratification of international treaties. This study demonstrates that the increase in the percentage of women representatives in parliaments leads countries to ratify more international human rights, environmental, and women's rights treaties. The impact that women's descriptive representation has on legislative branches is not only statistically significant but substantively significant. This relationship is consistent in the two-way fixed effects negative binomial regression models. Given that the previous findings on the link between women's descriptive representation and policy outcomes are mixed because of the lack of a well-designed cross-national study (Wängnerud 2009), the use of time-series cross-national data in this study enabled us to bridge this gap and test the general impacts of women's descriptive representation worldwide.

Moreover, we provide clues that the influence of a gendered composition in legislative branches on international treaty ratification is similar to that on domestic lawmaking and policy adoption. At the same time, this research demonstrates that domestic variables, including women's descriptive representation, the levels of economic development and democracy, and left-wing governments and political parties, are closely related to countries' international behavior. This empirical result provided additional evidence for the literature arguing for the importance of domestic determinants of international treaty ratification.

We should note that the innate limitations of the quantitative approach also apply to our study, even though our empirical results are based on various model specifications and robustness checks. Despite using time-series cross-national data testing and the findings' generalizability based on conditional expectation functions, the quantitative approach does not guarantee the confirmation of

theories but only tests the hypotheses. Thus, the natural extension of this work is to, by employing case studies or comparative approaches, thoroughly examine the mechanisms behind the association between women's descriptive representation and the ratification of international treaties about human rights, the environment, and women's rights. Also, future research comparing the legislative behaviors of female and male representatives related to the ratification of international treaties will be promising.

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여성의 산술적 대표성과 국제다자조약 비준

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의회내 여성 의원의 증가는 국가의 국제조약 참여에 어떤 영향을 주는가? 여성의 정치적 대표성 변화가 국내 정치에 미치는 영향에 관한 다양한 연구가 존재하는 데 반해, 여성의 정치적 대표성과 국제 조약의 비준 사이의 연관성에 대한 연구는 많지 않다. 본 연구는 존재의 정치 이론(the Politics of Presence Theory)과 결정적 다수 이론(the Critical Mass Theory)에 기반하여, 의회에서 여성의 산술적 대표성(descriptive representation)과 다양한 국제다자조약--인권, 환경 및 여성의 권리--비준 사이의 연관성을 알아본다. 1961년부터 2019년까지 158개국의 시계열 국가별 데이터를 기반으로 실시한 통계분석을 통해 본 연구는 여성 의원의 비율이 높은 국가가 인권과 여성의 권리와 환경에 관한 국제 조약을 더 많이 비준하는 경향이 있음을 발견하였다. 또한, 여성의 산술적 대표성이 환경 조약 비준에 미치는 영향이 성별에 따른 정부 의석 할당제가 있는 국가에서 감소한다는 것을 발견하였다. 본 연구의 실증적 결과는 여성정치학과 국제조약 비준 연구의 간극을 좁히고자 하겠다는 점에서 학문적 함의를 지닌다.