GROWTH IN WOMEN'S POLITICAL REPRESENTATION: A LONGITUDINAL EXPLORATION OF DEMOCRACY, ELECTORAL SYSTEM, AND GENDER QUOTAS*

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ABSTRACT

The expansion of women's formal political representation ranks among the most significant trends in international politics of the last 100 years. Though women made steady political progress, substantial country-level variation exists in patterns of growth and change. In this paper, we develop longitudinal theories to examine how political factors affect women's political representation over time. We use latent growth curve models to assess the growth of women in politics in 110 countries from 1975 to 2000. We investigate how electoral systems, national-level gender quotas, and growth of democracy impact country-level trajectories of women's legislative representation. We find: (1) national quotas do affect women's political presence, but at a lower level than legislated by law; (2) the impact of a proportional representation system on women's political representation is steady over time; and (3) democracy, especially civil liberties, does not affect the level of women's political representation in the earliest period, but does impact the growth of women's political representation over time. These findings both reinforce and challenge prior cross-sectional models of women's political representation.

GROWTH IN WOMEN'S POLITICAL REPRESENTATION: A LONGITUDINAL EXPLORATION OF DEMOCRACY, ELECTORAL SYSTEM, AND GENDER QUOTAS

The expansion of women's formal political representation ranks among the most significant trends in international politics of the last 100 years. Over the course of little more than a century women first gained the right to vote nationally (New Zealand, 1893), appeared in parliament for the first time (Finland, 1907), reached 10% of a national legislature (USSR, 1946), reached 30% of a national legislature (German Democratic Republic, 1967), and recently reached 49% of a parliament (Rwanda, 2003).

Along with the worldwide growth in women's political representation there is substantial country variation in patterns of growth and change. Some countries, such as Sri Lanka and Turkey, have always had less than 5% female parliamentary representation. Others, like Denmark and Mozambique, show steady increases in female representation over time, ultimately resulting in greater than 30% female representation. Still others, after a long period of low female representation, made rapid gains over a short period of time (e.g., Rwanda, South Africa, and Pakistan). The timing of gains differs across countries as well. Some countries made their gains in female representation in the 1980s (Iceland, Canada, Spain), while others made major gains in the 1990s (Australia, Austria, Germany). There are even countries that have yet to elect their first female representative, such as Micronesia.

Surprisingly, however, researchers have not directly investigated growth or decline in women's numbers over time. Instead, previous research has focused on comparisons across countries in the *level* of women's representation at recent time points. Cross-sectional research demonstrates that certain political factors, such as a proportional

representation electoral system or the introduction of a national gender quota, are associated with higher levels of women's political representation (e.g., Norris 1985; Rule 1987; Paxton 1997; Matland 1998; Kenworthy and Malami 1999; Tripp and Kang 2007). But scholars have not examined how these factors change women's representation over time. Instead, prior studies infer intra-country (within-country) change from inter-country (between-country) differences in levels of various political attributes, like presence of a gender quota, at one point in time. Assessing growth and change, however, requires longitudinal theory, data, and models.

Attention to change requires a developmental theory, one that addresses how relevant variables influence a country's overall growth process. Indeed, understanding institutions may require analyzing "processes over a substantial stretch of years, maybe even many decades or centuries" (Pierson and Skocpol 2002:698). Longitudinal theories allow us to hypothesize slow-moving processes that can make a large difference over time, as well as episodic influences that act over a shorter and constrained period of time (Hughes and Paxton 2008).

We investigate the longitudinal impact of democracy, electoral system, and national-level gender quotas. Whether democracy shapes women's access to political positions is our first focus. An argument that democracy is good for women's political representation has found little support in cross-sectional research. Our theory, outlined below, suggests that initial levels and growth in democracy produce gains in women's representation *given time* through an increasing returns process. Further, we investigate what features of democracy help women in gaining political power. This is the first

comprehensive examination of democracy to fully account for the likely longitudinal nature of democracy's effect.

Second, the importance of electoral system to women's political representation is arguably the most consistently-demonstrated finding in the cross-sectional literature (Rule 1981; Norris 1985; Paxton 1997; Kenworthy and Malami 1999; Reynolds 1999; McAllister and Studlar 2002; Paxton, Hughes, and Green 2006) and is an obvious choice for testing over time. Previous research has demonstrated effects in a series of cross-sections. Longitudinal testing allows us to establish whether the effect of PR is stable over time or varies in response to a changing international normative climate pushing ever higher numbers of women in politics (Paxton, Hughes, and Green 2006).

Finally, the relatively new phenomenon of national gender quotas is being explored in hundreds of new reports and papers (e.g., Dahlerup 2006; Dahlerup and Nordlund 2004; Jones 2004; Schmidt and Saunders 2004; Jones 2005). But researchers have undertaken very few large-N analyses of quotas across countries and none of these takes a longitudinal or change perspective. Furthermore, prior research on quotas focuses on their presence or absence alone without regard to the legislated level, or threshold, of the quota. For the first time, we cross-nationally investigate the role of quota thresholds women's political representation.

This paper addresses these theoretical questions through analysis of longitudinal data on women's political representation across countries. We model intra-state change in women's representation with Latent Growth Curve models (Bollen and Curran 2006). Fundamental to our approach is the idea that countries exhibit trajectories of growth in women's representation over time. We argue that rather than considering individual

years of data separately, or considering the impact of only the previous year of data on the current year, we instead must consider women's legislative representation as a trajectory of growth, covering decades of change. An individual country's trajectory of growth can be modeled as linear, defined by an intercept and slope. Or country trajectories can be modeled as more complicated functions of time, e.g., curvilinear.

In this paper, our primary goal is to examine the growth of women's political representation in more than 100 countries across a period of 25 years, 1975 to 2000. To gain a general understanding of how women's presence in national politics has changed over time, we first estimate the fixed (world level) and random (country level) components associated with country-level differences in growth trajectories over time. Then, turning to our predictive model, we investigate how the electoral system, national-level gender quotas, and level of democracy impact country-level trajectories of women's legislative gains.

POLITICAL EXPLANATIONS FOR WOMEN'S POLITICAL REPRESENTATION

Women remain highly under-represented in national politics, with the average percentage of women in parliaments only 17.4 percent as of August 2007 (International Parliamentary Union 2007). But women's current 17% representation represents a substantial improvement from previous figures. Women made up only 2% of world parliamentarians in 1945, 5% in 1970, and 9% in 1990. As of 2000, women still had barely surpassed 10% of parliamentary seats (11.7%). To date we have little theory and/or analysis of this growth over time. We also know little about country variation in

patterns of growth and change in women's representation over time (Hughes and Paxton 2008).

Previous work on women in parliaments has firmly established that political factors, such as a proportional representation electoral system, are related to the percentage of women in national legislatures (Norris 1985; Rule 1987; Paxton 1997; Matland 1998; Kenworthy and Malami 1999; Tripp and Kang 2007). Political factors enhance or limit the ability of men, women, and other groups in government to promote their own interests. Indeed, features of political systems shape the very rules of the game and therefore whether women can attain political power (Kunovich and Paxton 2005; Matland 1998, 2002; Matland and Studlar 1996; Caul 1999, 2001; McCammon et al. 2001). In broad terms, a country's level of democracy sets the general context in which women contest seats or are placed into political positions. Specific features of the political system also impact women, including the electoral system and the presence and structure of gender quotas.

The vast majority of cross-national research on women in politics is cross-sectional, explaining variation in levels of representation at a single point in time, rather than patterns of growth or decline. Those few studies that do consider women's political representation over time do not explicitly model change (Studlar and McAllister 2002; McAllister and Studlar 2002; Paxton, Hughes, and Green 2006). In contrast, a developmental approach generates different hypotheses about the effect of traditional variables on women's political representation. In this section, we outline how three common explanations for women's parliamentary representation can be modified to predict growth and change in women's parliamentary representation.

Democracy

The extent to which democratic institutions should affect the representation of women as legislators is unclear. One the one hand, fair elections and open competition may be more conducive to women entering politics since fewer artificial and arbitrary constraints would act as barriers. In democracies the rules of the political game should be transparent, well-detailed, and consistent, helping women to see how they can work within the system to attain power. On the other hand, in the absence of true elections, women can be placed into power even when citizens do not support them (Abukhalil 2001; Howell 2002). Generally, large cross-national statistical studies have shown either no effect of democracy on women in parliament (Kenworthy and Malami 1999; Paxton and Kunovich 2003; Reynolds 1999) or a negative effect (Paxton 1997; Yoon 2001).[1] No large, cross-national quantitative study has ever shown a positive effect of democratic institutions on women's political representation.

But democratic countries may be disadvantaged in the static assessments typical of previous research. This is because the theorized impact of democracy on women's participation takes more time to accumulate than the impact of authoritarianism or totalitarianism. In a democratic system, women can research, understand, and possibly manipulate the clearly-stated and consistently-followed rules of the game (Matland 2002). In the presence of civil liberties, women can articulate gender asymmetries in

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[1] Some cross-national research has not assessed the impact of democracy on women's political representation and instead limits analysis to democratic countries (e.g., Schwindt-Bayer and Mishler 2005). Restricting the sample acknowledges that legislatures differ tremendously across countries, especially in terms of real power. But we argue that, regardless how much power a legislative position actually holds, national legislators are highly visible and have symbolic power. Increasing numbers of female parliamentarians, in any political system, encourages the re-conceptualization of how a parliamentarian looks and acts. More important, taking a longitudinal perspective provides clear theoretical reasons to believe that democracy could matter for women's political gains over time.

power, and, given time to organize, women's advocacy groups might agitate for greater representation. But since women have traditionally been excluded from mainstream political activities, their organizing activities may take time to bear fruit (Jaquette 1991). Indeed, research on women in transitions to democracy suggests that women find it difficult to translate activism during the transition into political representation after the transition (Friedman 1998; Waylen 1994; Viterna and Fallon forthcoming).

In short, a country's openness to democratic processes may strengthen women's position in the political sphere given time. Yet in a static, cross-sectional design, democracy would typically be evaluated as democracy in the election under consideration. Studies do not typically account for a country's prior levels of democracy, or a country's growth in democracy over time, which could be quite different from the level of democracy in the current period.

Taking a longitudinal perspective, in contrast, suggests that both high early levels of democracy and growth in democracy over time may increase women's political representation. High early levels of democracy represent the climate under which women begin to act to gain representation. Practice with free elections or free speech not only provides women with immediate experience in the political arena, but may have enduring effects that continue over many years by setting women onto a path of higher growth in representation. The process is one of increasing returns over time, where women's early presence creates momentum for further gains in the political sphere (Pierson 2000). In short, democracy at the start of the time period is causally relevant to a country's trajectory of growth. Translating this theory into a hypothesis yields:

Hypothesis 1: An early democratic climate, represented by the intercept of a country's growth curve of democracy (1975), will impact that country's trajectory of growth in women's political representation 1975 to 2000.

But democracy, like women's political representation, is not static. Countries become more or less democratic over time. As countries hold fair elections and extend freedoms, these openings provide political opportunities for women to contest representation. Open political institutions and expanded civil liberties should lead to increases in women's political learning, articulation of inequality, and activism. Further, these forces should expand the ability of women's movements and other groups to pressure for women's inclusion in politics.

Of course, an argument for democratization increasing growth in women's representation does not rest on women's activism alone. Instead, as in the case of Mozambique, the increased competition experienced by parties under democratic rules may pressure parties to court female voters by appealing to them with female candidates (Hughes 2007). For these reasons, the growth of democracy over time should impact women's growth in political power.

Hypothesis 2: Growth in democracy over time, represented by the slope of a country's growth curve of democracy (1975-2000), will impact a country's trajectory of growth in women's political representation 1975 to 2000.

But what aspect of democracy should matter for women's representation? Democracy is typically defined with at least two dimensions (e.g., Dahl 1971; Bollen 1993). The first dimension, political rights, exists to the extent that the national government is elected by a meaningful process and parties compete for political power.

Civil liberties, the second dimension, exist when the people of a country have the freedom to express political opinions in any media and the freedom to organize and to participate in any political group.

The two dimensions of democracy may have different effects on women's political representation over time. Changes in political rights correspond to changes in institutional rules – e.g., fair elections are held, shifts in power occur through elections, and the government becomes increasingly free of military control. When political rights increase, therefore, women may be better able to understand the clear and transparent rules of political game and more easily compete alongside their male counterparts. Increased competition among political parties can also lead to more female candidates and leaders as courting voters, including female constituents, becomes important. In short, expanded political rights may matter to women through an institutional learning mechanism.

In contrast, changes in civil liberties correspond to changes in personal freedoms – e.g., reductions in censorship, more open public discussion, greater freedom of assembly, and free private organizations. When civil liberties increase, women are better able to agitate for change in a process of internal activism. Women have the free speech and ability to organize that allow them to directly lobby the government or political parties about women's concerns. External activism, such as pressure from the international women's movement, may also be more effective in an environment of less restricted civil liberties. In the presence of free organization, speech, etc. international organizations can found chapters, train women, and provide resources for campaigns. In

short, increases in civil liberties may matter to women's representation through expanded opportunity for activism.

A recognition that political rights and civil liberties may have differential effects on women's political representation suggests that the above hypotheses can be modified to distinguish overall growth in democracy from growth in political rights and growth in civil liberties.

Quotas

A gender quota is a party or legislative rule requiring that women make up a certain percentage of a candidate list, a parliamentary assembly, a committee, or a government. Most governments and political parties adopting quotas are attempting to reach at least 20 or 30 percent women in parliament (IDEA 2006). But quotas differ in the level at which representation is required. Nepal, for example, has a quota of 5% while Costa Rica set a threshold of 40%.

When quotas are mandated by the state, it can result in dramatic increases in the proportion of women elected (e.g. Jones 1998; Dahlerup and Freidenvall 2005). Aili Mari Tripp and Alice Kang (2007) found that quotas were a powerful predictor of women's political representation across 149 countries. Even when only a subset of parties adopt quotas, diffusion may lead other parties to increase their percent of female candidates and representatives (Matland and Studlar 1996). Not all quotas are effective in achieving stated goals, however (Krook 2003). Quotas may lack placement mandates (designed to prevent parties from burying women at the bottom of party lists), for example (Jones 2004). Or, in the absence of sanctions, party leaders may fail to comply

with quota regulations (Dahlerup 2006). Generally, the same quota legislation may produce a much different outcome depending on the context in which the quota is adopted (Schmidt and Saunders 2004; Jones 2005).

Because quotas are an electoral reform that takes place in a given year, a gender quota is a time-specific influence that affects women's political representation *in that year*. A gender quota, therefore, is not expected to affect a country's entire growth process, but instead influences women's political representation in a given year controlling for a country's general trajectory. Put another way, gender quotas are designed to push a country *off* its current trajectory of growth – to "jump start" women's representation (Dahlerup and Friedenvall 2005).[2] Consider Figure 1, which depicts Costa Rica's trajectory of women's political participation. In 1996, Costa Rica adopted a national quota and in 2002 substantially strengthened its quota law. These two events influenced Costa Rica's level of women's participation, but only in the years after the quota was implemented. Thus, the introduction of a national quota fundamentally changed the percent of women in Costa Rica's parliament in recent years, but not Costa Rica's entire trajectory.

FIGURE 1 ABOUT HERE

It is reasonable to ask whether gender quotas push a country off a general trajectory in particular years, or whether gender quotas set countries onto entirely new trajectories. In answering this question it is important to remember that countries can

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[2] Quotas are not endogenous – enactment of quota legislation is surprisingly unrelated to the percent of women in politics. Quotas, couched in terms of "modernization," are pushed by international agents often in the absence of significant mobilization by local women's movements (Paxton, Hughes, and Green 2006). For instance, in 1997 the male-dominated legislature of Peru approved gender quotas, "without prior pressure from domestic women's organizations and with minimal debate, presumably because then-president Alberto Fujimori had sensed the advantages of such a measure" (Towns 2004:214).

remove quotas as well as introduce them. Looking at a few countries that have

implemented and then withdrawn quotas illustrates the importance of viewing quotas as

impacting years rather than trajectories. Consider Egypt and Pakistan, which had

national quota policies from 1979-86 and 1985-90, respectfully. Figure 2 illustrates that

both countries saw a decline in women's political participation that corresponds to the

years in which the quotas were rescinded. Figure 2 suggests that we must consider

quotas as electoral rules affecting women's political participation in a given year, not the

entire trajectory.

FIGURE 2 ABOUT HERE

Gender quotas are an important, but relatively new, political factor for

understanding women's representation in politics. Although party quotas and small

numbers of reserved seats existed in certain countries since the 1970s, Argentina was the

first country to adopt a national electoral gender quota in 1993. National-level quotas

then spread throughout Latin America, and after 1995, many African countries followed

suit with reserved seats and party-level quotas (Ballington 2004; Tripp 2003). During the

1990s, 22 countries adopted national electoral law quotas that required between 20% and

50% of candidates for legislative office to be women (Baldez 2004). The presence of a

national-level gender quota is therefore only expected to influence a country's trajectory

after 1995.

Hypothesis 2: The enactment of a gender quota by 1995 or 2000 will affect a country's

level of women's political representation in that year above and beyond the changes we

expect from the overall growth process.

As discussed above, not all quotas are effective in achieving stated goals (Krook 2003). Party leaders may choose to face the consequences of ignoring a quota, sometimes because there are no significant penalties for non-compliance (Dahlerup 2006). In other cases, parties do follow the quota to the letter of the law, but implement the policy in a way that renders it less effective. Thus, even if quotas do push countries upward off of their growth trajectories, quotas may have less an impact than might be expected given the level of women's representation legislated by the quota. Further, the question remains whether higher quota thresholds (e.g., 25-30%) are actually more effective at generating higher levels of growth in women's political representation. Indeed, France adopted a parity law in 2000 requiring all parties to run 50 percent female candidates, but in 2007, women were elected to only 19 percent of seats in the National Assembly. For these reasons, although previous quantitative research has found that quota presence or absence matters for women, it is worth investigating whether quotas with higher thresholds produce higher gains for women.

Electoral System

Finally, we turn to a discussion of electoral system. In the literature on women in politics it is generally accepted that the presence of a proportional representation (PR) system, rather than a plurality-majority system (e.g., as in the United States), aids women in gaining access to the political system (Norris 1985; Rule 1987; Paxton 1997; Matland 1998, 2002; Kenworthy and Malami 1999; Reynolds 1999; McAllister and Studlar 2002; Paxton, Hughes, and Green 2006). In PR closed-list systems, citizens vote for party lists of candidates rather than individual candidates. Proportional representation (PR) systems

attempt to correlate the number of seats won by a political party with the number of votes cast for that party. So, generally, if a party wins 30% of the votes, they receive 30% of the parliamentary seats. Legislators are selected by moving down the party list, in order, until all seats are filled. PR systems also make use of multi-member districts, which means more than one candidate can be elected from a particular district. In contrast, plurality-majority systems like the United States ask citizens to vote for single candidates, typically in single-member districts.

An electoral system that uses a PR list system and multi-member districts offers several advantages to female candidates (Matland 2002). In a single-member district, getting on the ballot is a zero-sum process where parties must choose between male and female candidates. In contrast, since parties operating under PR-list systems publish lists of candidates, they may feel pressure to balance their party's ticket across genders, leading to greater numbers of women (Matland 2002). In multimember districts, balancing is used to attract voters but also to achieve equity across different factions of the party and resolve internal party disputes through compromise (Matland 2002; Gallagher 1988).

Countries can and do switch between electoral systems. A proportional representation system is therefore a time-specific characteristic of a country that impacts women's political representation in individual years. Like quotas, therefore, electoral system influences women's political representation in a given year controlling for a country's general trajectory. Unlike quotas, the impact of PR is expected to operate in all years, rather than in just a few (post-1990) years. If quotas are a one-time attempt to

14

"jump-start" women's representation in a subset of countries, PR acts as a series of time-specific "nudges."

Hypothesis 3: A country's electoral system in a particular year impacts its level of women's political representation in that year above and beyond the changes we expect from the overall growth process.

Because prior research on proportional representation has been in a series of cross-sectional studies, we know the estimated effect of PR on women's political representation but do not know whether this effect is changing over time. There are at least two reasons to believe that proportional representation systems may be becoming more important for women's political representation over time. First, an increasing effect of PR over time may be driven by normative change. As discussed above, theory suggests that part of the observed influence of PR on women's representation is because parties feel pressure to generate lists of candidates with an appropriate balance across genders. But what counts as "appropriate balance" may change over time. As domestic or international pressure increases to include more and more women, PR systems may be more responsive to changing demands for women's political representation than plurality-majority systems (Paxton, Hughes, and Green 2006). Second, increasing effects of PR may result from an increasing returns process that accelerates the effect of PR over time (Pierson 2000). For example, if PR systems begin to pull more women into political office in the 1970s, these women may become better placed to recruit additional women into office in subsequent years (Kunovich and Paxton 2005; Kittilson 2006). For these reasons, it is of interest to examine the size of the effect of electoral system on women's legislative presence over multiple election years.

DATA AND METHODS

We analyze the growth of women's political representation at the national level in 110 countries that reached formal independence before 2000 (i.e., East Timor and territories such as Hong Kong and Taiwan are excluded). Because the processes facilitating women's inclusion in politics are different in Marxist-Leninist countries, producing substantially different trajectories, we chose not to incorporate countries that are currently or were Marxist-Leninist during any time throughout their history. Thus, all of Eastern Europe, the former Soviet states of North and Central Asia, as well as China, Cuba, Laos, North Korea, and Vietnam are removed from the analyses. Countries with less than 1 million population in the year 2000 are also excluded (United Nations 2004). Finally, we do not analyze countries that never elected a national legislative body over the period: Brunei Darussalam, Oman, Qatar, and Saudi Arabia.

As a measure of women's political incorporation across countries, we predict the percent women in the lower or single house of each country's national legislature from 1975 to 2000, measured every five years. Data were obtained from the Inter-Parliamentary Union (1996) and the Inter-Parliamentary Union's PARLINE Database, supplemented by additional information from the CIA World Factbook, US State Department's Background Notes, and governmental and national legislature websites.

As predictors, we include three political variables: democracy, electoral system, and national gender quotas. To begin, we obtain yearly data on democracy from Freedom House (2007). Freedom House has reported annual ratings from 1972 to the present and these are used widely in empirical research and by the policy community. Of

all subjective measures, the Freedom House ratings are the most conceptually similar to the definition of democracy. Further, Freedom House breaks its scales into political rights and civil liberties (e.g., Gastil 1988) allowing tests of specific hypotheses about the impact of democracy on women's representation. Auxiliary analyses estimated the models using both the updated POLITY IV dataset (Marshall and Jaggers 2005), and Bollen's (1980) democracy measure in place of Freedom House.

Our longitudinal theory suggests that both high early levels of democracy and growth in democracy over time may increase women's political representation. Therefore, we model democracy as a growth process and predict women's representation with the intercept and the slope of the democracy growth curve. To maximize flexibility in modeling democracy, we free the factor loadings of the growth curve (Bollen and Curran 2007:98-102). Details about the creation of the democracy growth curves are available from the authors.

Electoral systems are coded as a set of lagged time-varying dummy variables. Using plurality systems as the reference category, we estimate the effects of PR systems (including mixed-PR systems) and an "Other" category that incorporates periods of one-party rule, coup years, and other legislative breaks. Because the percent women in a legislature in a given year may reflect the results of elections that occurred in prior years, we lag the electoral system variables by five years. Data on electoral systems were coded by combining a range of information sources including datasets (Beck et al. 2001; Golder 2005), articles and books (Otero and Perez-Linan 2005; Croissant 2003), and websites (e.g., IDEA 2006; African Elections Database 2006).

In 1995 and 2000, we also code three variables related to country adoption of a national-level gender quota: (1) a dummy variable marking adoption of any quota, (2) a dummy variable marking adoption of a quota requiring at least 10 percent women in parliament, and (3) the actual threshold of a country's gender quota (IDEA 2006). These three variables capture variation in quota thresholds that is relevant to determining whether quotas produce gains in women's representation equal to their legislated levels. For example, quotas requiring less than 10 percent women are unlikely to substantially alter the trajectory of women's political incorporation in a given year. It may take quotas legislated at 10% or greater to produce measurable gains in women's representation. Because quotas are measured from the year they are implemented rather than the year they are adopted, we do not lag the effects of quotas. Finally, the quota variables are only included for the last two time points (1995 and 2000) because, as noted above, the first national-level quota with a substantial threshold was not implemented until 1993.

Method

We analyze the growth of women's political representation over time using Latent Growth Curve (LGC) models (Bollen and Curran 2006). LGC models analyze change over time by focusing on intra-country change – estimating both starting positions (intercepts) and trends (slopes) for each country. As an example, consider Figure 3, which presents women's political representation for four countries, 1970-2000. Sweden began the period with 14% women in parliament, and grew to almost 45% over the time period. In contrast, the United States began the period with 3% women in its national legislature and rose to 14% by 2000. Three countries - Iceland, Japan, and the United

18

States - have similar starting points, but Sweden's starting point is substantially higher. All four countries exhibit a growing proportion of women in politics, but at different rates.

FIGURE 3 ABOUT HERE

Thus, the first goal of a latent growth curve analysis is to estimate the parameters that determine an individual country's parliamentary growth trajectory over time. Represented in equation form,

$$y_{it} = \alpha_i + \beta_i \lambda_t + \varepsilon_{it} \tag{1}$$

where y_{it} is the value of the trajectory variable (here, women's political representation) for the ith case at time t, α is the intercept for case i, β is the slope for case i, and λ is a constant taking on linear values across time. In this model, each case, i, has a distinct intercept and slope.

The world average starting point (intercept) of women's political representation in 1975, and the world average rate of change (slope) in women's political representation over time are also of interest. In the unconditional model, this leads to two additional equations,

$$\alpha_i = \mu_\alpha + \zeta_{\alpha i} \tag{2}$$

$$\beta_i = \mu_\beta + \zeta_{\beta i} \tag{3}$$

Where μ_α and μ_β are the mean intercept and mean slope across all cases (here, the world average intercept and slope). The first equation represents a country's individual intercept (α_i) as a function of world average intercept (μ_α) and a disturbance ($\zeta_{\alpha i}$). The second represents a country's slope (β_i) as a function of the world average slope (μ_β) and a disturbance ($\zeta_{\beta i}$).

The second goal of a latent growth curve analysis is to model the factors that explain country-level variation in the growth trajectory. By predicting the trajectory, we can explain why some countries begin the period either higher or lower on women's political representation and why countries exhibit differential rates of change over time. We can also look for the impact of other variables – such as the enactment of a quota – that add or detract from the growth process at a given time.

As discussed above, electoral system and quotas are modeled as time-varying covariates, pushing countries off their average growth trajectory at each observed time point.

$$y_{it} = \alpha_i + \lambda_t \beta_i + \gamma_{y_t w_{t-1}} w_{i,t-1} + \gamma_{y_t v_{t-1}} v_{i,t-1} + \gamma_{y_t z_t} z_{,it} + \varepsilon_{it} \tag{4}$$

Again, y_{it} is the value of the trajectory variable for the ith case at time t. The growth process is modeled with α for the intercept for case i, and β for the slope for case i. In addition to the growth process, however, now women's representation in each year is also affected by a country's electoral system (where w represents a proportional representation system and v an alternative system (plurality-majority systems are omitted)) and the presence or absence of a quota (z).

The intercept and slope of Democracy (DI_i and DS_i), in contrast, are hypothesized to affect the intercept and the slope of the overall trajectory of women's political incorporation.

$$\alpha_i = \mu_\alpha + \gamma_{\alpha 1} DI_i + \gamma_{\alpha 2} DS_i + \zeta_{\alpha i} \tag{5}$$

$$\beta_i = \mu_\beta + \gamma_{\beta 1} DI_i + \gamma_{\beta 2} DS_i + \zeta_{\beta i} \tag{6}$$

We estimated all models in AMOS 6.0. Missing data were accounted for using a maximum likelihood estimation procedure (FIML) (Allison 2002; Arbuckle 1995).[3] Model fit is assessed using the chi-square test statistic, the Incremental Fit Index (IFI) (Bollen 1989), and the root mean squared error of approximation (RMSEA) (Steiger and Lind 1980). Significant chi-square statistics reject perfect fit between data and model, and are therefore taken as an indicator of poor model fit. Non-significant chi-square statistics are an indication of good fit. The closer the IFI to 1.0, the better the fit of a model. In contrast, the closer the RMSEA to 0, the better the fit of the model.

RESULTS

World growth in women's political representation

To begin our examination of the overall growth trajectories of women's political representation, we first fit an unconditional linear latent growth curve model, represented in Figure 4. Path diagrams like Figure 4 represent relations between observed (measured) and unobserved (latent) variables. Latent variables are enclosed in ovals while observed variables are represented with boxes. Straight arrows indicate direction of influence while curved two-headed arrows indicate a covariance between two variables that is unexplained in the model. Measurement error is indicated by δ, and errors in equations are indicated by ζ.

As represented in Figure 4 and corresponding to equations 1-3 above, the factor loadings for the measures of women's political representation on the latent intercept are fixed to 1.0 to represent the initial starting point of the growth trajectory, and the loadings

[3] Recent reviews of methods to deal with missing data list maximum likelihood as one of two optimal procedures (e.g., Allison 2002).

on the latent slope begin at 0 in 1975, increasing by 1 each five-year interval to indicate

linear growth.[4] In addition, the latent intercept and slope are freely correlated.

FIGURE 4 ABOUT HERE

Examining the means and variances of the latent intercept and slope terms provide

some basic information about the average growth of women's political representation

over time. The mean of the intercept term suggests that on average, countries have 3.31

percent women in parliament at the first time point, 1975. But there is also meaningful

country-level variability around the world average (the variance of the intercept, 12.50, is

significant p<0.001). Turning to the latent slope, the mean indicates that, on average,

women's political representation increased rather slowly over time—1.26 percent every

five years. But again, we find significant country-level variation around the sample

mean (1.51). These results are reasonable. For example, the United States, which has

typically fallen at about the world average, had 3.7 percent women in Congress in 1975

and 14 percent 25 years later in 2000 (our results suggest that the world average rose to

12%). Interestingly, the correlation between the intercept and the slope (.14) is

nonsignificant, suggesting that countries with higher initial levels of women in parliament

do not have faster growth.

Without any predictors, the unconditional latent growth curve model does not fit

the data well ($\chi^2 = 96.41$, 23 df, N = 110, p < 0.001; IFI = 0.89; RMSEA = 0.171).

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[4] Although the trajectory of women's political representation is quite linear in our sample, we did
investigate a number of alternative specifications. The most general alternative specification entails setting
the first and last factor loadings of women's political representation on the latent slope to 0 and 1
respectively, allowing a freely nonlinear specification to be estimated from the data. We plot the estimated
slope factor loadings, which represent the overall shape of the trajectory of women's political
representation over time as a proportion of change over time, in Appendix A. The appendix figure
demonstrates that the proportion of change between subsequent time points remains fairly constant over
time, suggesting that the linear specification used in this paper is appropriate.

Although the significant chi-square is not necessarily a definitive indicator of poor fit, the IFI below 0.90 and RMSEA above 0.10 both suggest there is substantial room for improvement. However, we expect a poor fit for this initial model. Indeed, without including measures that explain why individual countries deviate from the average growth trajectory of women's political representation across time, the model is unlikely to fit the data well. Thus, we next extend our basic model to include important political predictors of women's legislative outcomes.

Prediction of Women's Political Representation over Time.

Figure 5 presents the expanded latent growth curve model that includes measures of electoral systems, gender quotas, and democracy. Three models are estimated, one for each measure of democracy (overall, political rights, and civil liberties). Table 1 presents the results in tabular form. Before turning to the substantive results, we note that as expected, once predictor variables are included, model fit improves substantially (e.g., IFI = 0.95, RMSEA = 0.09 in Model 3). Although the chi-square statistic ($\chi^2 = 333.6$, 183 df) remains significant at p<0.001, the IFI of 0.95 suggests excellent model fit, and the RMSEA at .09 suggests good model fit.

<div align="center">FIGURE 5 ABOUT HERE</div>

<div align="center">TABLE 1 ABOUT HERE</div>

The most relevant comparison in Table 1 is between the effects of democracy in Models 1, 2, and 3. Model 1 predicts the intercept and slope of women's political representation with the intercept and slope of overall democracy. Model 2 substitutes political rights for overall democracy and Model 3 substitutes civil liberties. Across all

three models, we see that initial levels of democracy do not affect initial levels of women's representation in 1975. But initial level of democracy does influence the rate of growth in women's political representation over the next twenty-five years. Higher average early levels of democracy set women onto a path of higher growth in representation over time. In contrast to previous research that often does not find an effect of democracy on women's representation in a given year, we find that democracy can benefit women in politics over the long term. By taking a longitudinal perspective, this is the first study to ever find a positive effect of democracy on women's political representation. These results suggest that high early levels of democracy create a climate where women can act to gain representation over time.

Theory suggests that growth in democracy can also benefit women. But here the results differ by dimension of democracy. The results for Model 1 and Model 2 are similar and do not demonstrate an effect of growth in overall democracy or political rights on women's later growth in representation. But examining civil liberties in Model 3 reveals a positive and significant effect. Growth in civil liberties produces growth in women's representation. It therefore appears that, in the presence of openings in free organization, speech, and so on, women are able to agitate for change. Overall, comparing the political rights and civil liberties results suggests that rather than an institutional learning mechanism, it is women's expanded opportunity for activism that leads to growing returns in representation over time.

Compared to plurality-majority systems, countries with proportional representation (PR) or mixed-PR systems consistently have significantly higher levels of women's political representation. With the anomalous exception of 1980, there is a

24

relatively stable gain of 2.5% for countries utilizing a PR electoral system from 1975 to 2000.[5] This effect size is generally consistent with cross-sectional research that.finds a boost to women's representation of 2% to 3.5% (e.g., Kenworthy and Malami 1999; Paxton 1997). The effect size is stable across time, suggesting that PR provides a steady small boost to women's numbers that does not increase over time due to normative pressures. The "Other" category that incorporates periods of one-party rule, coup years, and other legislative breaks was also included in each year. The effect of this variable is largely nonsignificant. It serves as an important control, however, to clarify the distinction between PR systems and the omitted category, majority-plurality systems. Overall, our longitudinal results support with an over-time extension the previous finding of the importance of PR electoral systems to women's political representation.

Turning to the effects of national-level gender quotas, we find that the presence of any national-level quota only has a positive and statistically significant effect in 2000. By that year, countries with any national-level quota have, on average, 2.4 percent more women in parliament than countries that had not adopted such quotas by 2000. The lack of a 1995 effect is not surprising, perhaps, given that only four countries (Argentina, Bangladesh, Belgium, and Italy) had implemented national-level gender quotas by 1995. But by 2000, the presence of a gender quota does appear to push a country off its trajectory, by 2% on average.

In Table 2, we consider two alternate ways of measuring the effects of national-level quotas that incorporate differences in the quota threshold, the level of women's

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[5] The anomaly in 1980 is due entirely to a single case – Zimbabwe. Zimbabwe enters the analysis in 1980 (its date of sovereignty) with a PR electoral system and a relatively low level of women's representation. If Zimbabwe is removed from the analysis, the coefficients for PR are steady over the time period.

representation legislated by the quota. The models reported are equivalent to Model 3 in Table 1 (which includes a latent growth curve of civil liberties), but employ different quota variables. The baseline for comparison is Model 3, which again shows that any national-level quota will push women's legislative representation upwards in 2000 by an average of 2.4 percent. Once we consider only the effects of quotas requiring at least 10 percent women, however, the magnitude of the quota effect increases. Quotas legislating at least 10 percent increase women's political representation 3.7% on average, roughly a fifty percent increase over the effect of any quota. Thus, it appears that a quota's required threshold impacts the magnitude of gains observed in women's presence in national legislatures,

Of course, a 4% result is not the 10% (minimum) intended outcome of these changes in electoral or constitutional law. But if most quotas have low thresholds (say 10% quotas) and many countries were already close to that threshold in 2000, then 4% could be a reasonable boost in women's representation. In contrast, if most quotas have a higher threshold (e.g., 30%) and countries were low in women's representation, then it would appear that quotas do not jump-start women's representation by very much, on average. In reality, the average quota threshold in 2000 was 27% and the average percent women in parliament only 12%. Thus, the 4% boost in women's numbers suggests that quotas produce increases at a lower level than legislated by law, controlling for a country's growth in women over time.

In Model 4, we test the effects of differences in quota threshold more directly by substituting an ordinal measure of threshold for the quota dummy variables. Thus, in each year, we consider how the level of women's representation legislated by a quota

26

translates into gains in women's political representation, controlling for each country's overall growth trajectory. We find that higher thresholds do generate larger increases in women's numbers in 2000. But interestingly, a 10 percent increase in the quota threshold only pushes countries above their average trajectory by about 1 percent.[6]

The finding here supports case-study research that has found that national gender quota laws do not always generate substantial increases in women's representation (Schmidt and Saunders 2004; Jones 2005). To explain variation in the success of quota laws, scholars often focus on particular features of quota legislation that may influence the law's effectiveness. For example, placement mandates, such as two women required among the top five candidates, may enhance the effectiveness of a quota (Jones 2004). And sanctions for non-compliance set consequences if party leaders fail to comply with quota regulations (Dahlerup 2006). It is also important to recognize that our measure of national-level gender quotas does not capture any party-level quotas.

CONCLUSION

Interest in women's formal political representation has grown exponentially over the last thirty years. Academics as well as activists have documented women's general under-representation in politics across all countries of the world. Indeed, the average percentage of women in parliaments was only 17 percent as of March 2007 (IPU 2007). But a focus on women's generally low numbers does not acknowledge the remarkable gains in political power that women have made over time, especially in some countries.

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[6] This effect is not due to the countries with low-threshold quotas (e.g., Kenya has a 6% quota). The effect size for quota threshold is identical (.10) in a model with a quota threshold variable that only includes quotas 10% or above (results not shown).

27

In this paper, we introduced a model of intra-country change in women's political representation over 25 years (1975-2000) and 110 countries. Our latent growth curve model hypothesized that initial levels and growth in democracy would influence a country's overall trajectory of growth in women's political representation. In contrast, the implementation of a national-level gender quota, and a country's electoral system in a particular year, was expected to affect a country's level of women's political representation in that year above and beyond the overall growth process.

We found that national quotas do affect women's political representation but not always at levels legislated by law. For example, a 1% increase in the legislated threshold of a national quota pushes a country off its overall trajectory of growth by only .1% on average. This finding supports previous case-study evidence that quotas do not always generate substantial increases in women's representation (Schmidt and Saunders 2004; Jones 2005; Dahlerup 2006). Although our analysis of quotas goes beyond simple presence/absence to incorporate quota threshold, there are other possible ways to model gender quotas. Alternatively, we could employ a broader or more limited definition of what constitutes an effective or meaningful gender quota. Future research will need to carefully investigate what aspects of quotas produce larger or smaller "jumps" off a country's overall trajectory.

We also tested the impact of electoral system on women's political representation over time. Because countries can and do change between electoral systems, we modeled proportional representation as a time-varying effect on women's representation. Our findings support prior cross-sectional research not only in finding an effect, but in demonstrating that the size of the effect has remained consistent over time. This finding

28

stands in contrast to reasonable theory suggesting that the effect of PR should grow over time.

Finally, in contrast to previous cross-national research, we found that democracy, although it does not influence the level of women's political representation in the earliest period, does impact the *growth* of women's political representation over time. Specifically, initial levels of overall democracy, political rights, and civil liberties matter for the slope of the trajectory of women's representation. This finding suggests that high early levels of democracy create a climate under which women can act to gain representation *over time*. Static assessments of the effect of democracy are therefore unlikely to capture the increasing returns effects of democracy on women's political activism. At the very least, therefore, future cross-sectional analyses need to include *lagged* values of democracy, since it appears that democracy takes time to have an effect.

Further, our investigation of the components of democracy shows that it is only growth in civil liberties over time that also produces growth in women's representation. A significant effect of civil liberties but not political rights on growth suggests that women's political learning, which is fostered by more stable and transparent institutions, is not fueling gains in women's numbers over time. Instead, it is increased freedoms, which fuel women's activism, that steepen the trajectory of women's legislative representation. This finding is supported by recent qualitative research on women's electoral success after democratic transitions that finds that women's movements play a critical role in helping institutionalize women's representation under the new regime (Viterna and Fallon forthcoming).

The political explanations explored in this paper are only one type of explanation for women's political representation. Other theories emphasize supply factors that increase or decrease the pool of women with the will and experience to compete against men for political office (Paxton 1997; Kenworthy and Malami 1999; Fox and Lawless 2004; Gray, Kittilson, and Sandholtz 2006). Another traditional explanation, culture, stresses that beliefs and attitudes influence both the supply of and demand for female candidates (Paxton and Kunovich 2003; Inglehart and Norris 2003:chp.6; Arceneaux 2001). Even newer explanations stress the role and power of international actors (Ramirez et al. 1997; Paxton, Hughes, and Green 2006). Future research will certainly need to investigate these factors over time, just as we have investigated political factors. For the first comprehensive investigation of intra-country change in women's political representation, however, it is important to begin with political explanations. Political systems are basic in that they shape the rules of the game and thereby influence how women can attain political power. Political explanations are further fundamental in the context of longitudinal research since incorporating system characteristics is necessary for correctly modeling country trajectories. As longitudinal research moves forward to investigate other explanations, the political model advanced here can be considered a baseline model.

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APPENDIX

Figure A1. Unconditional Growth Curve Freed Factor Loadings, 1970-2000
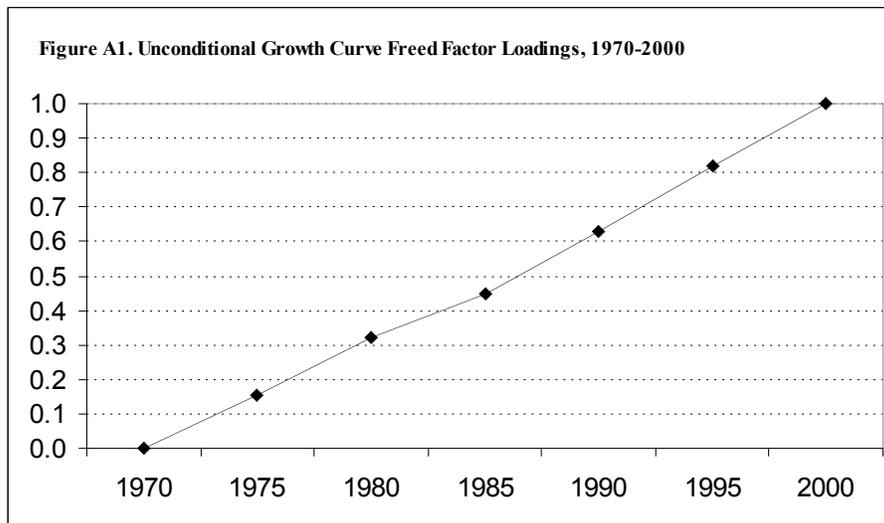
The trajectory of women's political representation is quite linear in our sample, though we did investigate a number of alternative specifications. Figure A1 presents results from the most general alternative specification, which entails setting the first and last factor loadings for the latent slope to 0 and 1, respectively (Bollen and Curran 2006:98-103). This allows a freely nonlinear specification to be estimated from the data (in contrast, the linear specification entails fixing all factor loadings in a linear sequence, 1, 2, 3…). The estimated factor loadings are plotted above and represent the average increase in women's political representation as a proportion of change over time. This figure demonstrates that the proportion of change between subsequent time points remains fairly constant over time, and reaffirms that the linear specification used in this paper is appropriate.

Figure 1. Women's Representation in Costa Rica, 1982-2006

| | 1996: Quota Law Adopted Requiring 40% Women on Party Lists | 2002: Placement Mandates Added to Quota Law |
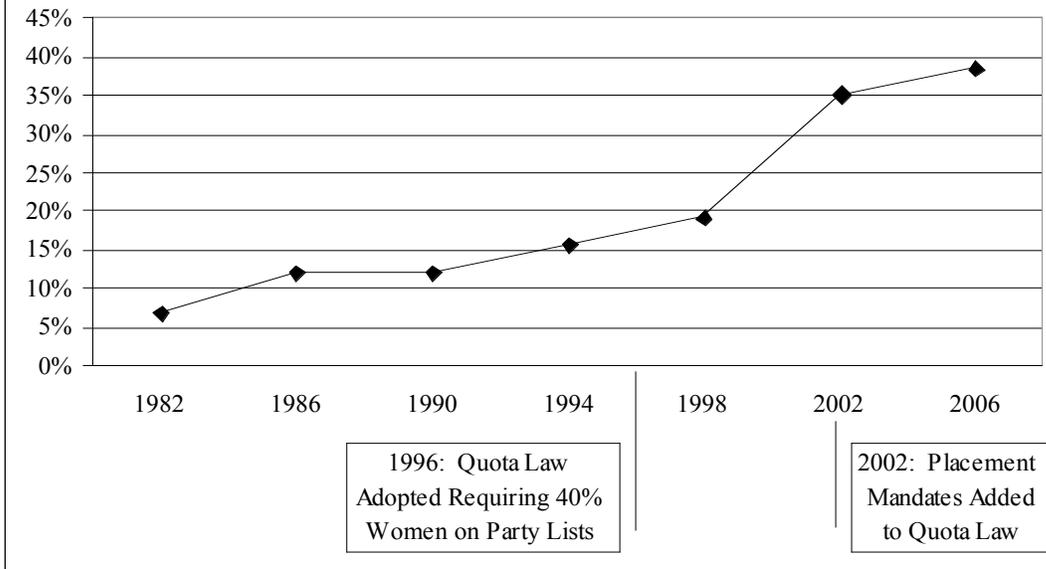
Figure 2. Women's Representation in Egypt and Pakistan, 1970-2000

1979: Egypt reserves 8% of seats for women

1985: Pakistan's quota increased from 5% to 8%

1990: Pakistan's quota removed

1986: Egypt's quota removed

Pakistan

Egypt
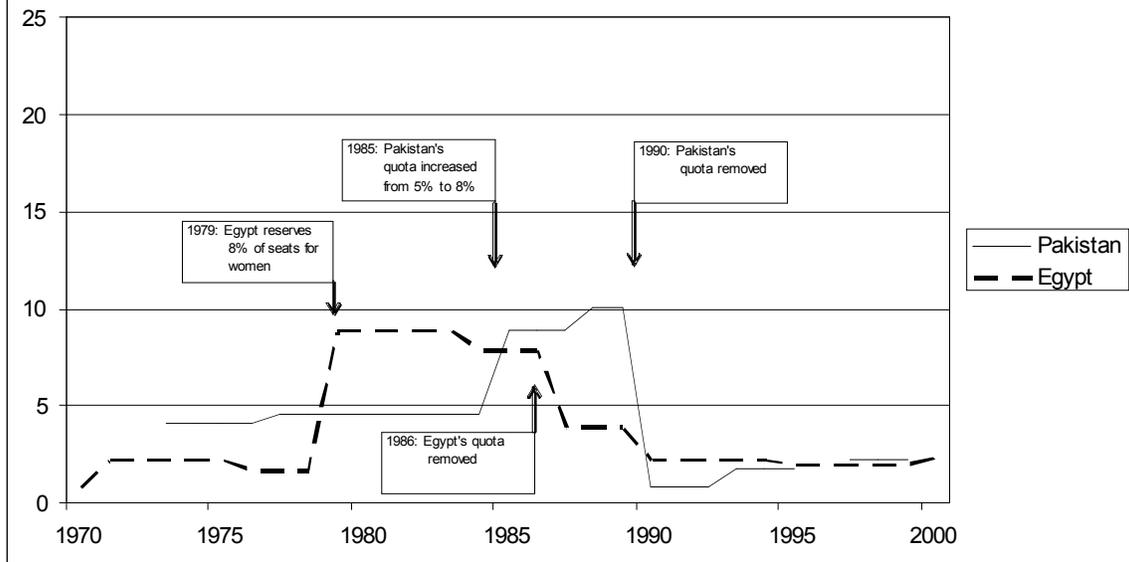
Figure 3. Women's Representation in Iceland, Japan, Sweden, and the United States, 1970-2000
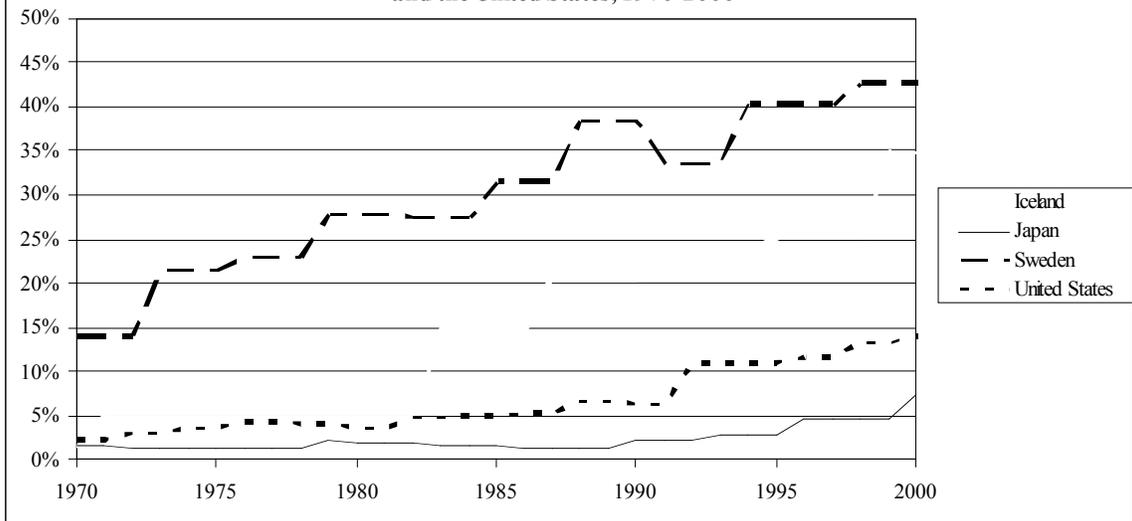
Figure 4. Unconditional Linear Growth Curve Model Predicting Women's Political Representation across 110 Countries, 1970-2000
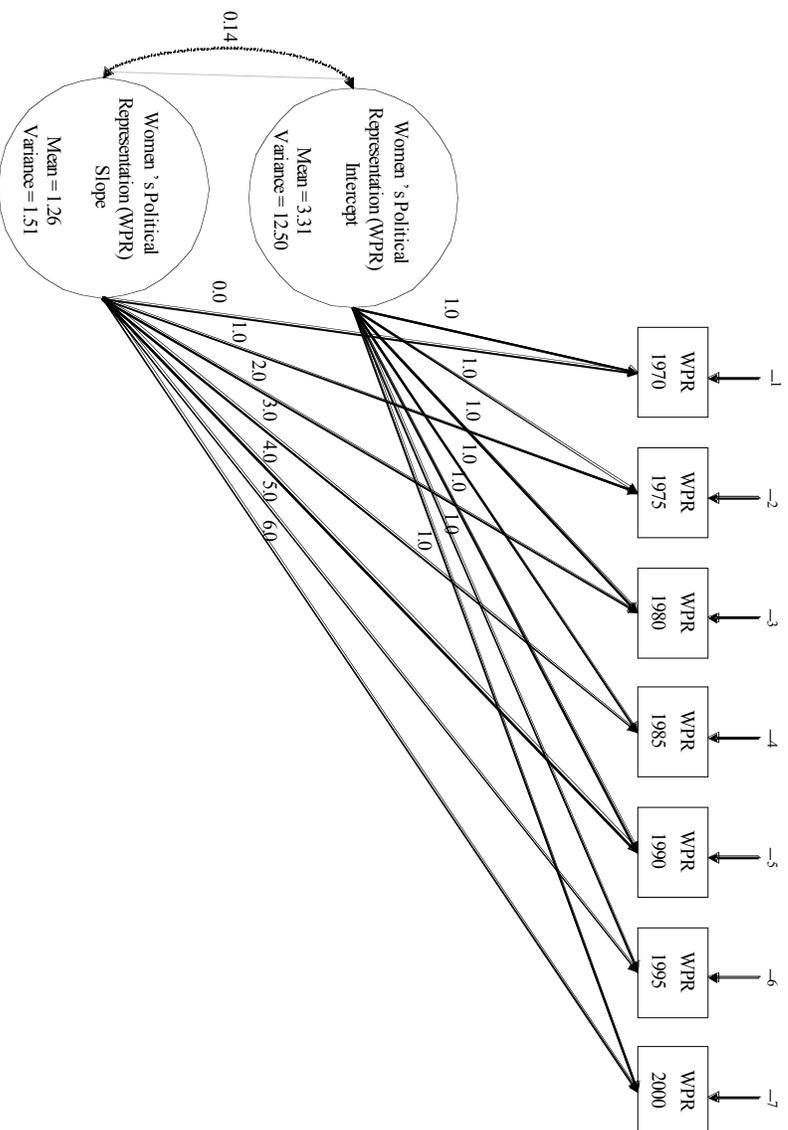
Note: 'WPR'=Women's Political Representation. Non-significant effects are indicated by a gray dotted line

Figure 5. Conditional Linear Growth Curve Model Predicting Women's Political Representation with Electoral Systems, National-Level Gender Quotas, and Average Level of Democracy across 110 Countries, 1975-2000
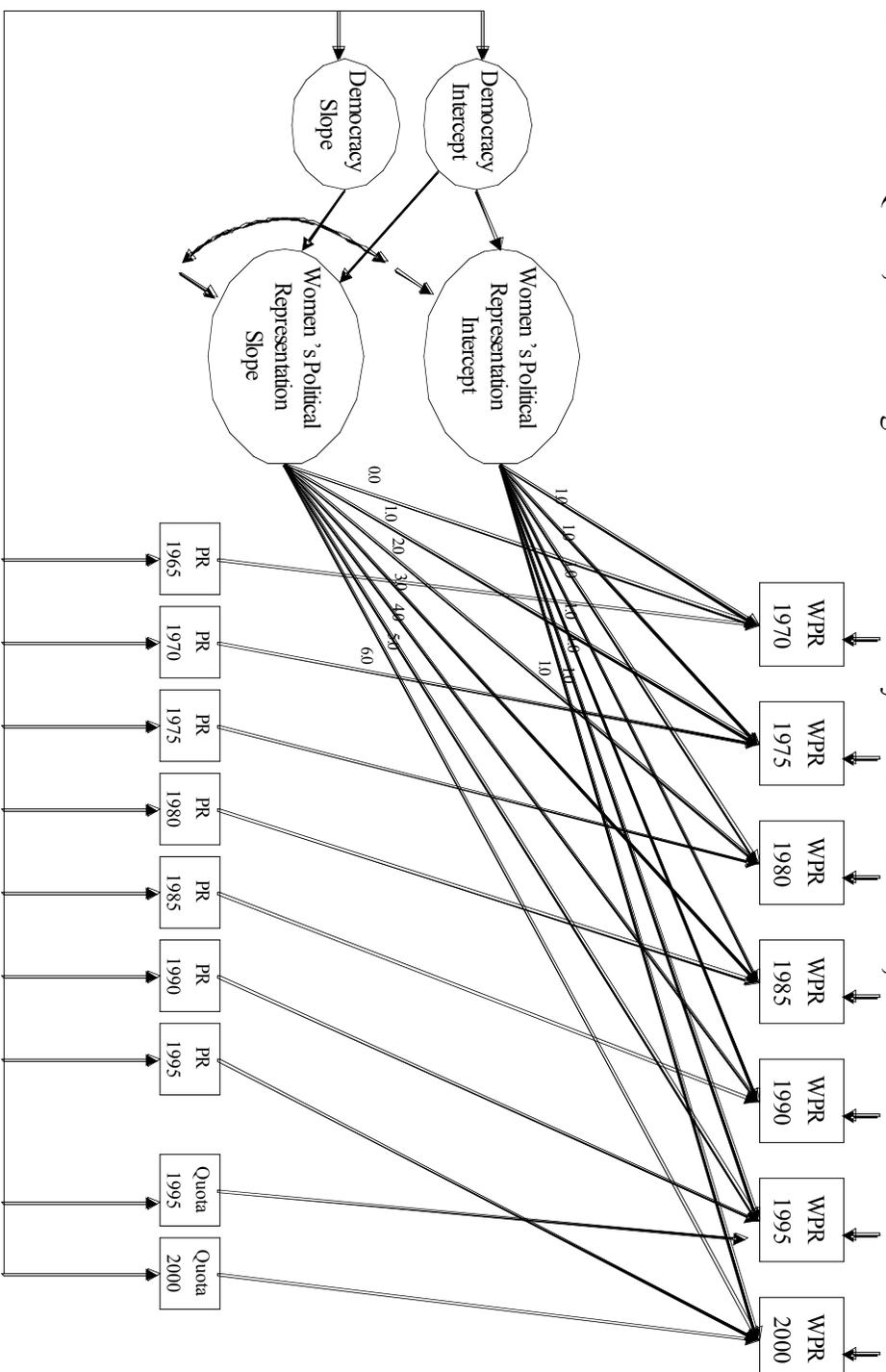
Note: 'WPR'=Women's Political Representation. 'PR'=Proportional Representation or Mixed-PR Electoral System. 'Quota'=National-Level Gender Quota. Although not depicted in the figure, this model also controls for countries with an "Other" electoral system, and plurality-majority systems serve as the reference category.

41

Table 1: Results from Conditional Linear Growth Curve Model Predicting Women's Political Representation with Electoral Systems, National-Level Gender Quotas, and Latent Growth Curve of Democracy in 110 Countries, 1975-2000

	WPR 75	WPR 80	WPR 85	WPR 90	WPR 95	WPR 00	_WPR	_WPR
Model 1--Average Democracy								
_Democ							0.12	0.52 ***
							(0.28)	(0.09)
_Democ								0.21
								(0.14)
PR Elec	2.52 *	2.24 **	1.10	2.07 *	2.50 *	2.59 *		
	(0.99)	(0.83)	(0.84)	(0.92)	(1.07)	(1.24)		
Oth Elec	0.75	1.16 [t]	0.47	0.81	0.11	1.68		
	(0.83)	(0.63)	(0.65)	(0.71)	(0.86)	(1.41)		
Any Quota	--	--	--	--	0.97	2.46 [t]		
					(1.70)	(1.45)		

Goodness-of-fit statistics: X^2 = 382.03, d.f. = 183, p =.000; IFI = .94; RMSEA = .10.

	WPR 75	WPR 80	WPR 85	WPR 90	WPR 95	WPR 00	_WPR	_WPR
Model 2--Political Rights								
_PolRts							0.00	0.45 ***
							(0.26)	(0.08)
_PolRts								0.08
								(0.14)
PR Elec	2.67	2.42	1.26	2.29	2.76	2.88		
	(0.97)	(0.82)	(0.84)	(0.93)	(1.08)	(1.26)		
Oth Elec	0.58	1.01	0.38	0.74	0.10	1.42		
	(0.84)	(0.64)	(0.66)	(0.72)	(0.87)	(1.43)		
Any Quota					1.20	2.73 [t]		
					(1.72)	(1.48)		

Goodness-of-fit statistics: X^2 = 392.03, d.f. = 183, p =.000; IFI = .94; RMSEA = .10.

	WPR 75	WPR 80	WPR 85	WPR 90	WPR 95	WPR 00	_WPR	_WPR
Model 3--Civil Liberties								
_CivLib							0.20	0.58 ***
							(0.29)	(0.09)
_CivLib								0.31 *
								(0.13)
PR Elec	2.39 *	2.11 *	1.00	1.97 *	2.36 *	2.42 *		
	(1.01)	(0.83)	(0.83)	(0.90)	(1.04)	(1.21)		
Oth Elec	0.81	1.25 *	0.49	0.80	-0.01	1.68		
	(0.83)	(0.62)	(0.65)	(0.71)	(0.84)	(1.38)		
Any Quota	--	--	--	--	1.07	2.44 [t]		
					(1.68)	(1.41)		

Goodness-of-fit statistics: X^2 = 333.62, d.f. = 183, p =.000; IFI = .95; RMSEA = .09.

[t]p<0.10, *p<0.05, **p<0.01, ***p<0.001 two-tailed tests. Numbers in parentheses are standard errors.

Note: 'WPR'=Women's Political Representation. '_Democ'=Intercept of Latent Curve of Democracy.

Table 2. Estimates for the Effects of Quotas on
Growth in Women's Political Representation

Model	Quota Type	1995	2000
3	Any Quota	1.07	2.44 [t]
		(1.68)	(1.41)
4	10% Quota	3.36	3.66 *
		(2.36)	(1.65)
5	Quota Threshold	0.14	0.10 [t]
		(0.09)	(0.06)

[t] $p<.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$ two-tailed tests.
Numbers in parentheses are standard errors.

Note: Models include measures of electoral system
and growth in civil liberties. The size and significance
of these effects, as well as model fit, are similar to
what is reported in Model 3 of Table 1.