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# EXAMINING GENDER DIFFERENCES IN ENVIRONMENTAL CONCERN ACROSS FOUR LEVELS OF THE SWEDISH POLITY

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## ABSTRACT

While numerous studies find modest, consistent gender differences in environmental concern within the general publics of North American and European countries, such a pattern has not been studied much among elected officials. The results from the few studies of elected officials are inconsistent. We test if women report stronger environmental concern than men across four levels of the Swedish polity, utilizing three datasets: a representative sample of the general public, a survey of all representatives in municipal-level and county-level councils, and a survey of the members of the Swedish Parliament. Results from our multivariate ordered logistic regression models reveal a consistent pattern across the lower three levels. Women report greater environmental concern than men in the general public, in municipal councils, and in regionally elected assemblies. In the Swedish Parliament, we find no significant gender difference on environmental concern, as the effect of gender is largely explained by political orientation.

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## Introduction

A large body of scholarship in the last two decades finds that women in many North American and European countries report moderately stronger environmental concern (i.e., pro-environmental values, attitudes, beliefs, and behaviors) than do men (Stern et al. 1993, Stern and Dietz 1994, Flynn *et al.* 1994, Bord and O'Connor 1997, Zelezny *et al.* 2000, Hunter *et al.* 2004, Dietz *et al.* 2007, McCright 2010). Yet, largely because of the lack of suitable data, much less research examines the relationship between gender and environmental concern among elected officials within political institutions. The paucity of such research on political decision-makers needs to be addressed if we are to better understand the links among gender, gender equality, environmental protection, and governance (United Nations Environmental Program 2011, p. 114).

Ergas and York (2012, p. 10) hypothesize that since women generally are more concerned about the environment than men, 'it is entirely possible that women make different decisions than do men when placed in positions of power.' This implies that women in elected office are also more pro-environmental than their male counterparts in similar positions (paralleling what is often seen in the general public), a claim that has been echoed in the discussion on women's political interests (Carroll *et al.* 2001, Tremblay 1998, Reingold 2000, Wängnerud 2000, Lovenduski and Norris 2003). However, the few empirical studies that have investigated this claim offer inconsistent support for it (McAllister and Studlar 1992, Esaiasson and Holmberg 1996, Jones 1997, Jensen 2000, Stokes 2005, Papaverio 2010, Fredriksson and Wang 2011, Fielding *et al.* 2012).

We aim to contribute to this emerging scholarship by examining the relationship between gender and environmental concern among elected officials and policy-makers—as well as among regular citizens. Specifically, we investigate this relationship at different levels of a country's polity: citizen voters, municipal elected officials, county elected officials, and elected officials in national parliament. Our study addresses the following research question: *Does the theoretically expected relationship between gender and environmental concern—where women are modestly more pro-environmental than men—vary across levels of the polity?*

To answer this question, we utilize three datasets from Sweden. As the country with Europe's highest percentage of female elected officials at the local level and one of the highest percentages of female legislators at the national level (Council of European Municipalities and Regions 2008, Interparliamentary Union 2012), the Swedish case provides an interesting venue for examining the

relationship between gender and environmental concern at different levels of the polity. We employ multivariate ordered logistic regression analyses on survey data from three sources: a 2009 nationally representative survey of the Swedish general public (n=3529, response rate=59%), a 2008 survey of all elected members of municipal and county Swedish assemblies (n=9890, response rate=70%), and a 2010 survey of all members of the Swedish Parliament (the *Riksdag*) (n=327, response rate=89%).

## Gender and Environmental Concern

Research on environmental concern in many North American and European countries in the past few decades consistently finds that women express slightly greater environmental concern than men. This modest gender difference exists whether environmental concern is operationalized via items measuring environment/economic tradeoffs (e.g., McStay and Dunlap 1983), participation in pro-environmental activities (e.g., Hunter *et al.* 2004, Xiao and McCright 2012b), pro-environmental attitudes or an ecological worldview (e.g., Stern *et al.* 1993, Xiao and McCright 2012a), or perceived seriousness of different types of environmental problems (e.g., Mohai 1997, Xiao and McCright 2013). The greatest gender differences are generally seen in studies dealing with the last type of indicator—worry about specific environmental problems, especially those local problems with clear health risks to family and community (e.g., Greenbaum 1995, Klineberg *et al.* 1998, Mohai 1992).

Given that our main contribution here is to examine the relationship between gender and environmental concern across different levels of the polity, we abstain from an extended literature review.<sup>1</sup> Rather, we briefly characterize this literature and then proceed to review those few studies that have examined the relationship between gender and environmental concern among elected officials and politicians.

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<sup>1</sup> Interested scholars can read the notable literature reviews in this area (e.g., Blocker and Eckberg 1997, Davidson and Freudenburg 1996, McCright 2010).

## Among Citizens in General Publics

In two classic pieces on gender and environmental concern in the general publics of Western societies, Davidson and Freudenburg (1996) and Blocker and Eckberg (1997) each describe the prevailing explanations of gender differences on environmentalism at the time. The two groups of explanations in these articles have come to be known as “gender socialization” arguments and “gendered social roles” arguments. The former emphasizes how childhood socialization processes (e.g., Chodorow 1978, Gilligan 1982) lead males and females to differ on important characteristics (e.g., concern about the safety and care of others, value orientations, risk perceptions, trust in science) that correlate with environmental concern.

The latter focuses on the influences of the social roles that men and women differentially perform as adults (e.g., Greenbaum 1995). For the most part, scholars focus on three productive or reproductive roles (employment status, homemaker status, and parenthood) that presumably relate to environmental concern. Much research finds that gender differences in environmental concern are independent of the social roles and statuses that men and women differentially occupy (e.g., McCright 2010, Mohai 1997). Over time, arguments on gendered social roles have received little empirical support, especially when tested side-by-side with gender socialization arguments.

Accordingly then, attention has turned to testing the explanations emphasizing gender socialization. Among these, the safety concerns hypothesis (e.g., Blocker and Eckberg 1997, Davidson and Freudenburg 1996, Xiao and Dunlap 2012a), the values orientations hypothesis (e.g., Dietz *et al.* 2002, Stern *et al.* 1993), and the risk perceptions hypothesis (e.g., Bord and O’Connor 1997, Xiao and McCright 2012b) enjoy relatively consistent empirical support. While this was also generally the case for the institutional trust hypothesis in earlier decades (e.g., Blocker and Eckberg 1997, Davidson and Freudenburg 1996), recent work suggests this hypothesis no longer enjoys such empirical support (e.g., Xiao and McCright 2013).

Overall, the finding of a modest gender divide among citizens in the general publics of North American and European countries is well established. Further, only a few, related theoretical explanations enjoy robust empirical support. Yet, while we know much about this gendered pattern within general publics, we know much less about it among elected officials—the topic to which we now turn.

## Among Elected Officials

Some research suggests that men and women in elected positions are not representative of the adult population in general (e.g., Matthews 1985, Carnes 2012). This work identifies a discongruency between the attitudes of the elected and those of the electorate (Costello *et al.* 2012, Eriksson 2007, Walczack and van der Brug 2012). In particular, the work of John Pierce and colleagues (Pierce and Lovrich 1980, 2005, Pierce *et al.* 1987) in the U.S. and Japan shows that the environmental attitudes of elected officials and the general public do not always align.

At the same time, the work on gendered environmental concern in general publics described above offers compelling reasons why women are more pro-environmental than are men. It may be that gendered patterns of environmental concern among elected officials are similar to those in the general public. This might be the case if the same gender socialization arguments that apply to gender differences among regular citizens also apply to elected officials. We briefly identify three possible arguments here, although our data does not allow us to evaluate their performance in our study.

Even among elected officials, females may still embody a greater level of concern for the safety and well-being of others (due to a heightened ethic of care) than men, which relates directly to greater environmental concern—according to the safety concerns hypothesis (e.g., Blocker and Eckberg 1997, Davidson and Freudenburg 1996, Xiao and Dunlap 2012a). Indeed, this safety concerns hypothesis is often invoked by scholars and observers to claim why female elected officials would be more pro-environmental than their male counterparts (e.g., Carroll *et al.* 1991, Reingold 2000, Tremblay 1998). Also, female elected officials may be more likely than their male counterparts to hold those values orientations (e.g., ecocentrism, altruism, openness to change) that are positively correlated with environmental concern—according to the values orientations hypothesis (e.g., Dietz *et al.* 2002, Stern *et al.* 1993). Further, according to the gendered risk perceptions hypothesis (e.g., Bord and O'Connor 1997, Xiao and McCright 2012b), female elected officials may perceive greater risk vulnerability than their male counterparts, which correlates positively with environmental concern.

Approximately a dozen studies investigate whether there is a gender difference in environmental concern among elected officials. Most of these studies exclusively analyze data from elected offi-

cialists in national parliaments or congresses, rather than examine a range of levels of institutional politics. Also, the geographic range of these studies is relatively narrow, focusing on elected officials in only a handful of countries: Argentina, Australia, Canada, Italy, Norway, Sweden, and the United States.

Seven studies produce no evidence that female elected officials are more pro-environmental than their male counterparts. All but the first study below analyze data from members of national parliaments or congresses. Reingold (2000) finds no gender difference in how active Arizona and California state legislature members are on environmental issues. In her study of Canadian Parliament members, Tremblay (1998) reports that men actually give marginally higher priority to environmental issues than do women. A study of the Italian Parliament reports that male legislators are actually more likely than female ones to introduce bills related to the environment (Papavero 2010). Examining data on bill introduction in the Argentinian Chamber of Deputies, Jones (1997) finds no significant gender difference on environmental issues.

Three other studies specifically report that gender differences on environmental concern disappear when controlling for legislators' party affiliation. This is the case in Jensen's (2000) examination of how Norwegian Parliament members perceive environmental risks, McAllister and Studlar's (1992) analysis of the environmental attitudes of candidates for Australian federal elections, and Fielding *et al.*'s (2012) study of concern about the impact of climate change among Australian politicians.

Five articles provide evidence that female elected officials are more pro-environmental than their male counterparts. Three of these focus on the U.S. Congress. Kahn (1993) finds that female legislators in the U.S. spend more time in their campaigning talking about "social issues," including the environment. A recent report reviews Congressional voting patterns between 2001 and 2010 and finds that women cast more pro-environmental votes than men (Rachel's Network 2011). Also analyzing the same data, Fredriksson and Wang (2011) conclude that female legislators favor stricter environmental policies.

Compared to their male counterparts, female politicians in Japan are more likely to focus on the environment as a policy area (Iwanaga 1998). Analyzing data from the 1990s on the environmental attitudes of Swedish Parliament members, Esaiasson and Holmberg (1996) report that female representatives are more pro-environmental than their male counterparts. More recently, Wängnerud (2000, 2010) analyzes the same type of data from Swedish Parliament members and finds that gen-

der gaps on environmental concern have decreased since the 1990s—to the point where there is no clear relationship between gender and environmental concern.

## The Study

While we have strong reason to believe that women in the general public report greater environmental concern than men, few studies have explicitly examined how environmental concern differs among male and female elected officials—and these have produced divided results. Given this, we aim to address the following research question: *Does the theoretically expected relationship between gender and environmental concern—where women are modestly more pro-environmental than are men—vary across levels of the polity?*

To answer our research question we utilize three datasets from Sweden. Having such high numbers of female representatives, the Swedish case is theoretically interesting. Also, the access to high-quality data provides a novel opportunity to examine gender differences in environmental concern across different levels of the polity.

The analysis of citizens' attitudes is based on a 2009 nationally representative survey of the Swedish general public. This nationwide mail questionnaire is performed annually by the SOM Institute (Society, Opinion, Media), an academic organization affiliated to the University of Gothenburg. The SOM surveys contain numerous questions on a wide selection of topics related to media and politics. The yearly samples are representative of the Swedish population and enjoy respectable response rates. The 2009 survey had a response rate of 59% for a sample size of 3529 citizens (see Nilsson 2010). The second dataset is based on a pioneering 2008 survey that sampled all elected members of the 290 municipal and 21 county elected assemblies in Sweden. This internet-based survey received 9890 responses, equaling a 70% response rate (see Gilljam *et al.* 2010). The third dataset is based on a 2010 mail questionnaire sent to all members of the Swedish national parliament (the *Riksdag*) (Esaiaasson *et al.* 2010a). In total, 327 responses were received, for a response rate of 89% (see Esaiaasson *et al.* 2010b).<sup>2</sup>

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<sup>2</sup> Elections for the national parliament, county councils, and municipal councils are held on the same day every fourth year. The Swedish Parliament has one chamber. Municipalities are governed by parliamentarism, where ruling coalitions are the executive power in each local assembly. Counties are the inter-mediary governing level in the Swedish political system (for a more detailed description see Gilljam *et al.* 2012). Eight parties are represented in the national



Table 1 provides the name, coding, mean, and standard deviation for each of the variables we use in our analyses. We operationalized our dependent variable, environmental concern, using several items from these three datasets that measure general pro-environmental orientations. At each of the four levels of the polity (citizen voters, municipal elected officials, county elected officials, and members of the national Parliament), data availability limited us to utilize single-item (rather than multi-item) indicators of environmental concern. Given that this data gives us the opportunity to systematically examine environmental concern across multiple levels of the polity, we judge this measurement compromise as being acceptable. Appendix A provides a more detailed description of each of our variables and indicates their availability at the four levels of the Swedish polity.

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parliament. At the municipal and county levels the numbers of parties are in some local regions higher, though the additional parties have only a marginal impact in the country as a whole.

**TABLE 1. CODING, MEAN, AND STANDARD DEVIATIONS FOR THE VARIABLES USED IN THE STUDY**

Variable	Coding	Mean	SD
<i>General Public</i> (N=3529)			
Support for environmental protection		1 (very bad proposal) to 5 (very good proposal)	3.54 1.05
Worry about environmental destruction		1 (not at all worried) to 4 (very worried)	3.43 0.68
Worry about climate change		1 (not at all worried) to 4 (very worried)	3.33 0.74
Sex		0 (male) to 1 (female)	0.51 0.50
Income		1 (<100,000 SEK) to 9 (>800,000 SEK)	4.97 2.24
Education		1 (primary school) to 3 (college or university)	2.18 0.48
Age		1 (18-29) to 4 (65 or older)	2.59 1.00
Religiosity (attendance)		1 (never) to 4 (at least once a month)	1.85 1.22
Children at home		0 (have none) to 1 (have at least one)	0.37 0.48
Political ideology		1 (far left) to 5 (far right)	3.03 1.17
Party identification (9 dummy variables)		0 (does not support) to 1 (supports)	
Devoted party supporter		1 (no) to 3 (yes, very)	1.73 0.71
<i>Municipal level politicians</i> (N=8757)			
Support for environmental protection		1 (very bad proposal) to 5 (very good proposal)	3.21 1.16
Sex		0 (male) to 1 (female)	0.42 0.49
Income		1 (<100,000 SEK) to 9 (>800,000 SEK)	5.42 1.94
Education		1 (primary school) to 3 (college or university)	2.37 0.71
Age		1 (18-29) to 4 (65 or older)	2.82 0.82
Religiosity (attendance)		1 (never) to 4 (frequent visits)	2.28 1.02
Children at home		0 (have none) to 1 (have at least one)	0.36 0.48
Political ideology		1 (far left) to 10 (far right)	4.76 3.04
Party identification (9 dummy variables)		0 (not affiliated) to 1 (affiliated)	
<i>County level politicians</i> (N=1171)			
Support for environmental protection		1 (very bad proposal) to 5 (very good proposal)	3.15 1.19
Sex		0 (male) to 1 (female)	0.47 0.50
Income		1 (<100 000 SEK) to 9 (>800,000 SEK)	5.97 1.91
Education		1 (primary school) to 3 (college or university)	2.52 0.66
Age		1 (18-29) to 4 (65 or older)	2.86 0.77
Religiosity (attendance)		1 (never) to 4 (frequent visits)	2.33 1.02
Children at home		0 (have none) to 1 (have at least one)	0.32 0.47
Political ideology		1 (far left) to 10 (far right)	4.83 2.96
Party identification (9 dummy variables)		0 (not affiliated) to 1 (affiliated)	
<i>National parliamentarians</i> (N=296)			
Worry about environmental destruction		1 (not at all worried) to 4 (very worried)	3.42 0.67
Sex		0 (male) to 1 (female)	0.44 0.50
Education		1 (primary school) to 3 (college or university)	2.63 0.56
Age		1 (18-29) to 4 (65 or older)	2.28 0.79
Religiosity (pray)		1 (never) to 4 (at least once a month)	2.16 1.00
Children at home		0 (have none) to 1 (have at least one)	0.45 0.50
Political ideology		1 (far left) to 10 (far right)	5.46 2.17
Party identification (8 dummy variables)		0 (not affiliated) to 1 (affiliated)	

We use three items as dependent variables in our analyses. In each case, higher values mean greater environmental concern. We use all three with our general public sample, and we use one each with our three samples of elected officials. Identical or similar items are commonly used as measures of environmental concern (e.g., Bord and O'Connor 1997, Stern *et al.* 1993).

One item, 'support for environmental protection,' measures whether respondents believe it is 'a very bad proposal' (1) or 'a very good proposal' (5) to 'invest in an environmentally friendly society even if it means low or no economic growth.' This item was included on the surveys of the general public and municipal-level and county-level officials. A second item, 'worry about environmental

destruction,’ was included on surveys of the general public and national parliamentarians. A similar item, ‘worry about climate change,’ was only included in the general public sample. For the last two items, responses ranged from ‘not at all worried’ (1) to ‘very worried’ (4).

In our analyses we control for a group of socio-demographic and political variables found to correlate with environmental concern (for an overview, see McCright and Dunlap 2011). Briefly, we control for income (Van Liere and Dunlap 1980), educational attainment (Heberlein 1981), age (Zelezny *et al.* 2000), religiosity (Sherkat and Ellison 2007), parenthood (Dietz *et al.* 1998), and political ideology and party affiliation (Fielding *et al.* 2012).

To answer our research question about whether the relationship between gender and environmental concern varies across levels of the polity, we ran a series of multivariate ordered logistic regression models on each of our four samples. For each dependent variable, we ran a model with sex as a predictor, a model with sex and the group of socio-demographic variables as predictors, and a model with sex, the socio-demographic variables, and political variables as predictors. Appendices B to E report the complete results of all these models for our samples of citizens, municipal elected officials, county elected officials, and national parliamentarians, respectively. Table 3 below presents the results for the full model for each dependent variable.

## Results and Discussion

Table 2 reports the percentages of men and women espousing environmental concern across four levels of the Swedish polity. As can be seen, there is a statistically significant gender difference in environmental concern across the polity in Sweden. At each level, greater percentages of women than men report environmental concern. For instance, 59.1% of women but only 49.8% of men in the Swedish public report that investing in an environmentally friendly society—even if it means low or no economic growth—is a good proposal. While these percentages fall a bit for municipal-level and county-level elected officials, the gender difference on this item remains: 47.4% and 40.9% for municipal-level female and male elected officials, respectively, and 46.3% and 38.1% for county-level female and male elected officials, respectively.

**TABLE 2. GENDER DIFFERENCES IN ENVIRONMENTAL CONCERN ACROSS FOUR LEVELS OF THE SWEDISH POLITY**

Environmental Concern Indicator	Men	Women
<b>Citizens</b>		
% choosing 'pretty good proposal' or 'very good proposal'		
invest in an environmentally friendly society even if it means low or no economic growth	49.8*	59.1*
% choosing 'pretty worried' or 'very worried'		
worry about environmental destruction	87.6*	94.1*
% choosing 'pretty worried' or 'very worried'		
worry about climate change	82.0*	90.8*
<b>Municipal-Level Elected Officials</b>		
% choosing 'pretty good proposal' or 'very good proposal'		
invest in an environmentally friendly society even if it means low or no economic growth	40.9*	47.4*
<b>County-Level Elected Officials</b>		
% choosing 'pretty good proposal' or 'very good proposal'		
invest in an environmentally friendly society even if it means low or no economic growth	38.1*	46.3*
<b>National Parliamentarians</b>		
% choosing 'pretty worried' or 'very worried'		
worry about environmental destruction	89.1*	94.7*

\* *Percentage difference between men and women is statistically significant ( $\alpha=0.05$ )*

The percentages of females and males in the general public who are worried about environmental destruction (94.1% and 87.6%, respectively) are quite similar to the same percentages of females and males in the national Parliament (94.7% and 89.1%). Finally, the percentages of females and males in the general public who are worried about climate change are also quite high: 90.8% and 82.0%, respectively.

Table 3 reports the results of our full multivariate ordered logistic regression models at four levels of the Swedish polity. For the most part, the bivariate patterns we saw in Table 2 hold up here—with one exception discussed below. Even controlling for a range of socio-demographic and political variables, females in the general public and in municipal-level and county-level assemblies report greater environmental concern than their male counterparts. While this is not surprising, it is a

crucial finding at local and regional polity levels that rarely go studied. Women in the general public are more supportive of environmental protection over economic growth and are more worried about environmental destruction and climate change than men. Also, females in municipal-level and county-level assemblies are more likely to favor environmental protection over economic growth than their male counterparts.

**TABLE 3. UNSTANDARDIZED ORDERED LOGISTIC REGRESSION COEFFICIENTS FROM MODELS EXPLAINING ENVIRONMENTAL CONCERN ACROSS FOUR LEVELS OF THE POLITY IN SWEDEN**

Predictors	General Public			Municipal Level	County Level	National Level
	Support for Environmental Protection	Worry about Environmental Destruction	Worry about Climate Change	Support for Environmental Protection	Support for Environmental Protection	Worry about Environmental Destruction
Sex (female)	.33*** (.07)	.62*** (.11)	.51*** (.11)	.31*** (.04)	.53*** (.12)	.49 (.27)
Income	-.03 (.02)	-.01 (.03)	-.01 (.03)	-.05*** (.01)	-.02 (.03)	
Education	.17** (.06)	.32*** (.09)	.19* (.09)	.06 (.03)	-.18 (.09)	.26 (.25)
Age	.05 (.04)	.05 (.07)	.07 (.06)	.12*** (.03)	.11 (.08)	.21 (.17)
Religiosity	.08* (.04)	.04 (.07)	.01 (.06)	.09*** (.02)	.17** (.07)	-.05 (.15)
Children at home	.09 (.08)	.16 (.13)	.20 (.13)	.11* (.05)	-.13 (.14)	.45 (.26)
Political ideology (left to right)	-.30*** (.05)	-.15* (.07)	-.10 (.07)	-.17*** (.02)	-.18*** (.04)	-.31* (.12)
Leftist Party	.33 (.26)	.23 (.40)	-.06 (.38)	.49*** (.14)	.79* (.38)	.66 (1.30)
Social Democrat Party	-.48** (.20)	.10 (.32)	-.06 (.31)	-.66*** (.09)	-.58* (.26)	-.62 (.67)
Green Party	.95*** (.22)	1.29*** (.37)	1.03** (.35)	2.95*** (.17)	3.85*** (.50)	1.85 (1.18)
Liberal Party	-.15 (.22)	.10 (.34)	-.40 (.33)	-.88*** (.10)	-.87*** (.26)	-.58 (.69)
Christian Democrat Party	-.18 (.26)	-.33 (.39)	-.39 (.39)	-.26* (.11)	-.20 (.29)	-.88 (.70)
Moderate Party	-.26 (.20)	-.12 (.31)	.17 (.30)	-1.18*** (.09)	-1.26*** (.25)	-1.72** (.56)
Swedish Democrat Party	-.96***	-.47	-.41	-.64**	-1.33*	-2.21**

	(.27)	(.40)	(.40)	(.21)	(.55)	(.76)
Other party	-.47* (.23)	-.50 (.37)	-.61 (.37)	-.65*** (.13)	-1.28* (.36)	
Devoted party supporter	.18*** (.05)	.10 (.08)	.15* (.08)			
N	2667	1325	1325	7349	1058	295
Pseudo R-squared	.05	.05	.04	.09	.13	.22
Log likelihood	-3609.25	-1173.29	-1296.50	-10159.24	-1419.59	-219.96

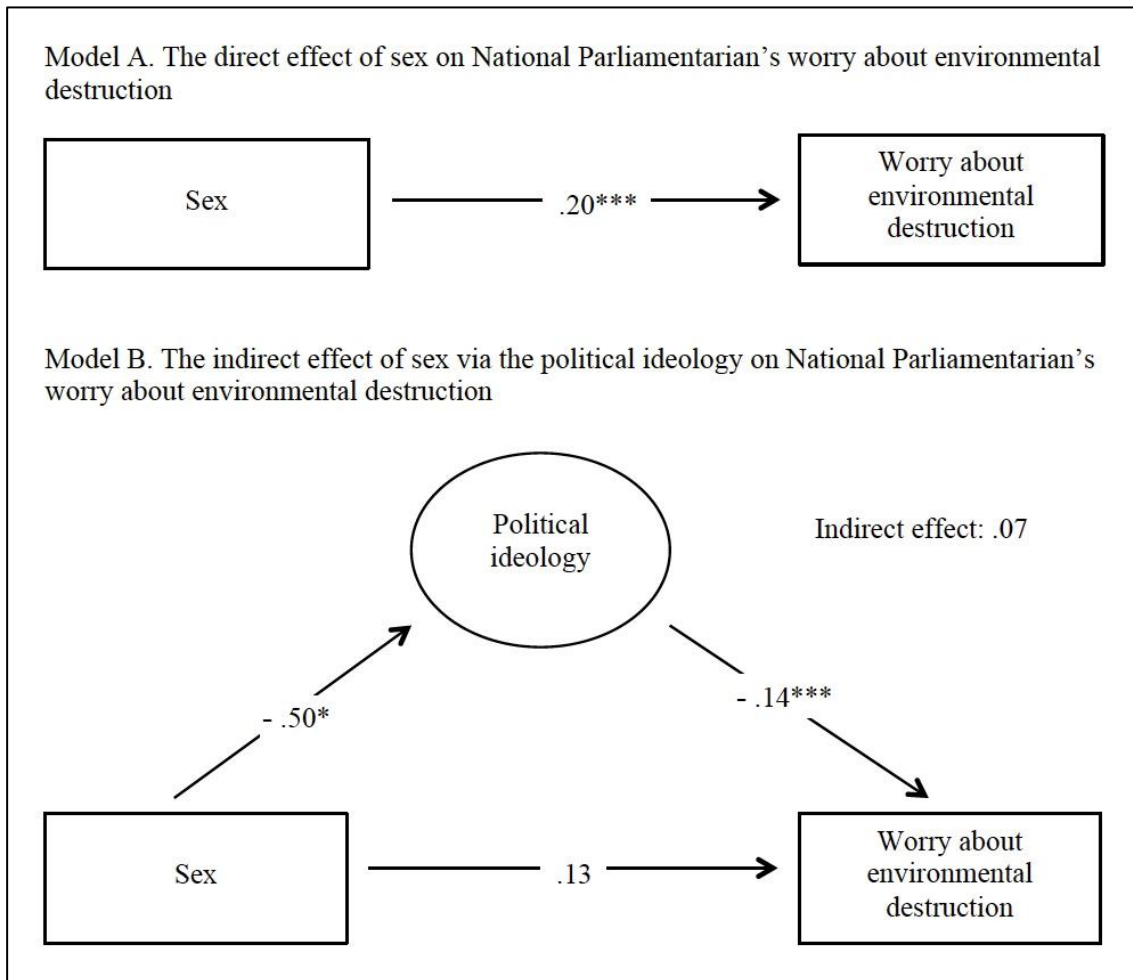
Notes: The Swedish centrist party, "Centerpartiet", is the reference category for the party dummy variables. Standard errors are in parenthesis. Estimation by Stata's ologit procedure. General public data is from the SOM Institute. Municipal-level and county-level data is from Gilljam et al. (2010). National-level data is from Esaiasson et al. (2010a).  
 \* =  $p < .05$     \*\* =  $p < .01$     \*\*\* =  $p < .001$

There was no such statistically significant gender divide within the national parliament, when controlling for the full set of socio-demographic and political variables. The results of the second and third models in Appendix E shed some light upon this. When controlling for the five socio-demographic variables in the second model in Appendix E, the effect of gender remains statistically significant. When also controlling for political orientation in the third model in Appendix E, gender no longer has a statistically significant effect on environmental concern. This is consistent with other studies of national-level elected officials that find that gender differences on environmental concern disappear when controlling for legislators' party affiliation (e.g., Fielding *et al.* 2012, Jensen 2000, McAllister and Studlar 1992). This suggests that political ideology may mediate the relationship between gender and environmental concern among national parliamentarians.

To test this assertion, we ran a mediation analysis and found that political ideology does mediate the relationship between sex and worry about environmental destruction among national Parliamentarians. Figure 1 displays the results of a mediation analysis using structural equation modeling. In Model A the unstandardized direct effect of sex on worry about environmental destruction is statistically significant effect with a magnitude of 0.20. Yet, when we allow political ideology to mediate this relationship in Model B, the direct effect of sex decreases to 0.13 and is not statistically significant. The unstandardized indirect effect, the difference between the direct effect of sex in Model A (0.20) and the direct effect of sex in Model B (0.13), is 0.07. Thus, a considerable portion of the total effect of sex on worry about environmental destruction is mediated via political ideology. These results indicate that the gender difference in environmental concern among Parliamentarians is explained by political ideology, as women in the Swedish parliament tend to be more left-leaning than their male counterparts. Thus, issue positions related to environmental concern among decision-makers at the national level are more driven by ideological position and less driven by psychological or socio-demographic characteristics of individuals.



**FIGURE 1. THE UNSTANDARDIZED DIRECT AND INDIRECT EFFECTS OF SEX ON PARLIAMENTARIANS' ENVIRONMENTAL CONCERN**



The effects of the socio-economic and political variables in our full multivariate ordered logistic regression models are also notable. Ideological position has a consistent, statistically significant effect on environmental concern in each of the four polity levels. Consistent with much existing research (e.g., Dunlap *et al.* 2001), Left-leaning individuals are more likely to report environmental concern than their Right-leaning counterparts. Also expected given past research (e.g., Jones and Dunlap 1992), educational attainment has a positive effect on environmental concern, but only in the general public. The positive effect of religiosity on environmental concern in the general public and among municipal-level and county-level elected officials is somewhat unexpected given that most studies find no relationship between religiosity and environmental concern (e.g., Eckberg and Blocker 1996, Hayes and Marangudakis 2000).

Three other socio-demographic variables—age, parenthood, and income—only have a statistically significant effect among municipal-level officials. Older municipal officials, those with children at home, and those making lesser income report greater support for environmental protection at the expense of economic growth than their respective counterparts. Finally, the performance of the dummy variables measuring party affiliation or identification (with the centrist party as reference category) deserve attention. The magnitude and direction of these effects are broadly in accordance to expectations. The effects of Left-leaning parties (e.g., the Green Party and the Left Party) are generally positive across multiple levels of the polity, and the effects of Right-leaning parties (e.g., the Swedish Democrats and the New Moderates) are generally negative across multiple levels of the polity.

## **Conclusion**

Numerous studies of the general publics in North American and European countries find that women report modestly stronger environmental concern than men. Yet, little research has examined the relationship between gender and environmental concern among elected officials. The empirical results of these few studies are inconsistent. In some studies there is no gender difference among elected officials, and in other studies women report greater environmental concern than men.

We attempt to increase our knowledge of how the relationship between gender and environmental concern varies across levels of the polity by analyzing three datasets from Sweden. These datasets allow us to investigate this relationship among citizen voters, municipal-level officials, regionally elected representatives, and national parliamentarians. Controlling for the results of a group of socio-demographic and political variables, our multivariate ordered logistic regression models demonstrate that women report greater environmental concern than do men in all levels of the polity but within the national parliament. While this is not surprising, it is a crucial finding at local and regional polity levels that rarely go studied. The fact that there is no direct gender effect among national legislators when controlling for political orientation is actually consistent with previous research (e.g., Fielding *et al.* 2012, Jensen 2000, McAllister and Studlar 1992).

Two major limitations of our study deserve mention. Both deal with measurement and are due to data limitations. First, although our measures of environmental concern were relatively equivalent, we did not utilize identical measures across all samples or polity levels. Second, we did not have multiple survey items across different levels to create composite measures of environmental concern. As such, we were left to utilize single-item indicators. Nevertheless, we are relatively confident that these similar single-item measures of environmental concern were adequate for our purposes.

Future research on this topic should examine whether our results appear in other contexts. This includes focusing not only on other European and North American countries but also on nations in Asia, Africa, and South America. Also, in these other countries does political orientation also fully explain gender differences in environmental concern among national legislators? In addition to examining environmental beliefs and attitudes, future research should also investigate gendered patterns in behaviors (e.g., bill introduction, voting, etc.). All of this is worthy of engaged scholarly attention to help us better understand the links among gender, gender equality, environmental protection, and governance (United Nations Environmental Program 2011).

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# Appendix A. Description of the Variables Used in This Study and Their Availability at Four Levels of the Swedish Polity

Variable	Description	General Public	Municipal Level	County Level	National Parliament
Support for Environmental Protection	"Below are a number of proposals that have occurred in the political debate. What is your opinion on each of them? . . . Invest in an environmentally friendly society even if it means low or no economic growth." (very bad proposal=1 to very good proposal=5)	X	X	X	
Worry about Environmental Destruction	"How much worry do you feel over the following issues? . . . Environmental destruction." (not at all worried=1 to very worried=4)	X			X
Worry about Climate Change	"How much worry do you feel over the following issues? . . . Climate change." (not at all worried=1 to very worried=4)	X			
Sex	sex of respondent (male=0, female=1)	X	X	X	X
Income	annual household income in Swedish currency (<100,000 SEK) to 9 (>800,000 SEK)	X	X	X	
Education	respondent's education level (primary school=1, high school=2, college or university=3)	X	X	X	X
Age	age of respondent (18-29=1, 30-49=2, 50-64=3, 65+=4)	X	X	X	X
Religiosity	how many times the respondent has visited a religious service/practice in the last year (never=1 to at least once a month=4)	X <sup>1</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>3</sup>
Children at home	respondent has a child living in his/her household (no=0, yes=1)	X	X	X	X
Political ideology	respondent's identification on a left-right political scale (far left=1 to far right=10)	X <sup>4</sup>	X	X	X
The Left Party	respondent is affiliated with Vänsterpartiet (no=0, yes=1)	X <sup>5</sup>	X	X	X
The Social Democrats	respondent is affiliated with Socialdemokraterna (no=0, yes=1)	X <sup>5</sup>	X	X	X
The Green Party	respondent is affiliated with Miljöpartiet (no=0, yes=1)	X <sup>5</sup>	X	X	X
The Liberal People's Party	respondent is affiliated with Folkpartiet (no=0, yes=1)	X <sup>5</sup>	X	X	X
The Christian Democrats	respondent is affiliated with Kristdemokraterna (no=0, yes=1)	X <sup>5</sup>	X	X	X
The New Moderates	respondent is affiliated with Nya moderaterna (no=0, yes=1)	X <sup>5</sup>	X	X	X
The Swedish Democrats	respondent is affiliated with Sverigedemokraterna (no=0, yes=1)	X <sup>5</sup>	X	X	X
Other (small) party	respondent is affiliated with one of the remaining smaller parties (no=0, yes=1)	X <sup>5</sup>	X	X	
Devoted party supporter	respondent is a devoted supporter of a party (no=1; yes, slightly=2; yes, very=3)	X			

<sup>1</sup> response categories are: never; more seldom; several times a year; at least once a month

<sup>2</sup> response categories are: never; more seldom; a couple of times; frequent visits

<sup>3</sup> how many times the respondent has prayed in the last year: never=1; more seldom=2; several times a year=3; at least once a month=4

<sup>4</sup> in the general public sample, ideology is measured on a 5-point scale (far left=1 to far right=5)

<sup>5</sup> in the general public sample, respondents are asked if they are a supporter of (and not affiliated with) a party

## Appendix B. Unstandardized Ordered Logistic Regression Coefficients from Models Explaining Environmental Concern in the Swedish General Public

	Support for Environmental Protection			Worry about Environmental Destruction			Worry about Climate Change		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Sex	0.47*** (0.07)	0.41*** (0.07)	0.33*** (0.07)	0.72*** (0.11)	0.67*** (0.11)	0.62*** (0.11)	0.59*** (0.11)	0.54*** (0.11)	0.51*** (0.11)
Income		-0.07*** (0.02)	-0.03 (0.02)		-0.03 (0.03)	-0.01 (0.03)		-0.03 (0.03)	-0.01 (0.03)
Education		0.25*** (0.05)	0.17** (0.06)		0.38*** (0.09)	0.32*** (0.09)		0.22** (0.08)	0.19* (0.09)
Age		0.05 (0.04)	0.05 (0.04)		0.07 (0.06)	0.05 (0.07)		0.08 (0.06)	0.07 (0.06)
Religiosity		0.09* (0.04)	0.08* (0.04)		0.02 (0.06)	0.04 (0.07)		0.03 (0.05)	0.01 (0.06)
Children in household		0.08 (0.08)	0.09 (0.08)		0.15 (0.13)	0.16 (0.13)		0.20 (0.13)	0.20 (0.13)
Ideological position (left-right)			-0.30*** (0.05)			-0.15* (0.07)			-0.10 (0.07)
Supports the Left Party			0.33 (0.26)			0.23 (0.40)			-0.06 (0.38)
Supports the Social Democrats			-0.48** (0.20)			0.10 (0.32)			-0.06 (0.31)
Supports the Green Party			0.95*** (0.22)			1.29*** (0.37)			1.03** (0.35)
Supports the Liberal People's Party			-0.15 (0.22)			0.10 (0.34)			-0.40 (0.33)
Supports the Christian Democrats			-0.18			-0.33			-0.39

			(0.26)			(0.39)			(0.39)
Supports the New Moderates			-0.26 (0.20)			-0.12 (0.31)			0.17 (0.30)
Supports the Swedish Democrats			-0.96*** (0.27)			-0.47 (0.40)			-0.41 (0.40)
Supports other smaller party			-0.47* (0.23)			-0.50 (0.37)			-0.61 (0.37)
Devote party supporter			0.18*** (0.05)			0.10 (0.08)			0.15* (0.08)
N	2667	2667	2667	1325	1325	1325	1325	1325	1325
Pseudo R2	.01	.01	.05	.02	.03	.05	.02	.02	.04
Log likelihood	-3759.8364	-3742.2082	-3609.2505	-1216.0791	-1205.0812	-1173.2922	-1331.7167	-1326.6166	-1296.4961

*Comment: \*\*\* =  $p < .001$  \*\* =  $p < .01$  \* =  $p < .05$ . Source: The SOM-institute, data on a representative sample of the Swedish general public. Numbers in the table are unstandardized coefficients. Estimation by the Stata 'ologit' procedure. The Swedish centrist party, "Centerpartiet", is used as a reference category for the party dummy variables. Standard errors are in parentheses.*

## Appendix C. Unstandardized Ordered Logistic Regression Coefficients from Models Explaining Environmental Concern among Municipal Elected Officials in Sweden

	Support for Environmental Protection		
	Model 1	Model 2	Model 3
Sex	0.37*** (0.04)	0.38*** (0.04)	0.31*** (0.04)
Income		-0.10*** (0.01)	-0.05*** (0.01)
Education		-0.00 (0.03)	0.06 (0.03)
Age		0.05 (0.03)	0.12*** (0.03)
Religiosity		-0.05** (0.02)	0.09*** (0.02)
Children in household		0.17*** (0.05)	0.11* (0.05)
Ideological position (left-right)			-0.17*** (0.02)
The Left Party			0.49*** (0.14)
The Social Democrats			-0.66*** (0.09)
The Green Party			2.95*** (0.17)
The Liberal People's Party			-0.88*** (0.10)
The Christian Democrats			-0.26* (0.11)
The New Moderates			-1.18*** (0.09)
The Swedish Democrats			-0.64** (0.21)
Other smaller party			-0.65*** (0.13)
N	7349	7349	7349
Pseudo R2	.00	.01	.09
Log likelihood	-11152.549	-11159.104	-10159.238

*Comment: \*\*\* =  $p < .001$  \*\* =  $p < .01$  \* =  $p < .05$ . Source: Gilljam et al. 2010, data from a survey on all representatives in Sweden's municipal and county councils. Numbers in the table are unstandardized coefficients. Estimation by the Stata 'ologit' procedure. The Swedish centrist party, "Centerpartiet", is used as a reference category for the party dummy variables. Standard errors are in parentheses.*

## Appendix D. Unstandardized Ordered Logistic Regression Coefficients from Models Explaining Environmental Concern among County Elected Officials in Sweden

	Support for Environmental Protection		
	Model 1	Model 2	Model 3
Sex	0.52*** (0.11)	0.54*** (0.11)	0.53*** (0.12)
Income		-0.09** (0.03)	-0.02 (0.03)
Education		-0.28*** (0.09)	-0.18 (0.09)
Age		0.09 (0.08)	0.11 (0.08)
Religiosity		-0.01 (0.02)	0.17** (0.07)
Children in household		0.08 (0.13)	-0.13 (0.14)
Ideological position (left-right)			-0.18*** (0.04)
The Left Party			0.79* (0.38)
The Social Democrats			-0.58* (0.26)
The Green Party			3.85*** (0.50)
The Liberal People's Party			-0.87*** (0.26)
The Christian Democrats			-0.20 (0.29)
The New Moderates			-1.26*** (0.25)
The Swedish Democrats			-1.33* (0.55)
Other smaller party			-1.28*** (0.36)
N	1058	1058	1058
Pseudo R2	.01	.01	.13
Log likelihood	-1611.1167	-1598.5488	-1419.5915

*Comment: \*\*\* =  $p < .001$  \*\* =  $p < .01$  \* =  $p < .05$ . Source: Gilljam et al. 2010, data from a survey on all representatives in Sweden's municipal and county councils. Numbers in the table are unstandardized coefficients. Estimation by the Stata 'ologit'*

*procedure. The Swedish centrist party, "Centerpartiet", is used as a reference category for the party dummy variables. Standard errors are in parentheses.*

## Appendix E. Unstandardized Ordered Logistic Regression Coefficients from Models Explaining Environmental Concern among National Parliamentarians in Sweden

	Worry about Environmental Destruction		
	Model 1	Model 2	Model 3
Sex	0.62** (0.23)	0.59* (0.24)	0.49 (0.27)
Education		0.10 (0.21)	0.26 (0.25)
Age		0.45** (0.15)	0.21 (0.17)
Religiosity		-0.35** (0.12)	-0.05 (0.15)
Children in household		0.54* (0.24)	0.45 (0.26)
Ideological position (left-right)			-0.31* (0.12)
The Left Party			0.66 (1.30)
The Social Democrats			-0.62 (0.67)
The Green Party			1.85 (1.18)
The Liberal People's Party			-0.58 (0.69)
The Christian Democrats			-0.88 (0.70)
The New Moderates			-1.72** (0.56)
The Swedish Democrats			-2.21** (0.76)
N	295	295	295
Pseudo R2	.01	.05	.22
Log likelihood	-276.61385	-266.56538	-219.9589

*Comment: \*\*\* =  $p < .001$  \*\* =  $p < .01$  \* =  $p < .05$ . Source: Esaiasson et al. (2010a), data from a survey on all members of the Swedish parliament, the Riksdag. Numbers in the table are unstandardized coefficients. Estimation by the Stata 'ologit' procedure. The Swedish centrist party, "Centerpartiet", is used as a reference category for the party dummy variables. Standard errors are in parentheses*



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