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Kulin, Joakim; Sevä, Ingemar Johansson

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Quality of government and the relationship between environmental concern and pro-environmental behavior: a cross-national study

Joakim Kulin  and Ingemar Johansson Sevä 

Department of Sociology, Umeå University, Sweden

ABSTRACT

Previous research consistently finds a relatively weak relationship between environmental concern and pro-environmental behavior, as environmentally concerned individuals often fail to act pro-environmentally, both in the private and public spheres. While the strength of the concern–behavior relationship varies considerably across countries, existing research has yet to provide a complete account of these cross-national differences. In this study, we add to previous cross-national research on the concern–behavior relationship by focusing on the quality of government. Using multilevel analysis and data from the *International Social Survey Programme* (ISSP), we demonstrate that people who are environmentally concerned are more likely to act pro-environmentally (in the public sphere), in countries where government institutions are fair, effective and impartial. We also find that people are generally more likely to engage in pro-environmental behavior in both the private and public sphere in countries where the quality of government is high.

KEYWORDS Pro-environmental behavior; environmental concern; quality of government (QoG); ISSP

Introduction

While climate change and global warming constitute existential threats to human societies, greenhouse gas emissions continue to increase, suggesting that the environmental efforts of societies are currently insufficient to reverse the trend of climate change and global warming (Norgaard 2011, Giddens 2015). In particular, the behaviors of ordinary citizens have important implications for societies overall climate change mitigation efforts. First, the everyday behaviors of citizens are either directly or indirectly responsible for a substantial proportion of greenhouse gas emissions (Vandenbergh and Steinemann 2007). Second, and perhaps more important, citizens' civic involvement and active participation in the democratic process constitute a crucial input into vital policymaking with regard to the environment and the climate (Hackmann *et al.* 2014). Yet, while the majority of citizens in most countries express concern about the

CONTACT Joakim Kulin  joakim.kulin@umu.se

environment and climate change (Kvaløy *et al.* 2012, Franzen and Vogl 2013a), the levels of pro-environmental behavior among ordinary citizens, particularly in the public sphere, are surprisingly low in most countries (Hadler and Haller 2011, Johansson Sevä and Kulin 2018).

Several scholars have characterized environmental problems in terms of a collective action dilemma (Lubell 2002, Sønderskov 2008), where individuals fail to cooperate even though it is in everyone's best interest to do so. In environmental collective action dilemmas, therefore, people will very likely fail to act pro-environmentally despite being environmentally concerned. Previous research provides support for this notion, showing that environmental concern far from always translate into pro-environmental behavior (e.g., Kollmuss and Agyeman 2002). However, cross-national research has demonstrated that the strength of the relationship between environmental concern and pro-environmental behavior differ considerably across countries and have attempted to explain these differences by focusing on contextual factors such as economic prosperity, individualism, post-materialism, or national trusts levels (Sønderskov 2008, Eom *et al.* 2016, Pisano and Lubell, 2017, Tam and Chan 2018).

In this study, we add to previous research on cross-national differences in the concern–behavior relationship by investigating the *quality of government* (QoG) as a contextual moderating factor. While some previous studies have shown that people's environmental beliefs, concerns and normative views more likely translate into support for environmental policies in countries with high-quality government institutions (Davidovic *et al.* 2020, Kulin and Johansson Sevä, 2019), few studies have attempted to link government quality specifically to the relationship between environmental concern and pro-environmental behavior in the private and public spheres. We argue that QoG, i.e., the effectiveness and impartiality of the government apparatus as a whole (see, e.g., Rothstein and Teorell 2008, Rothstein 2011) have crucial implications for the extent to which environmentally concerned individuals act on their concerns.

In this study, we argue that effective and responsive government institutions promote pro-environmental behavior in several ways. First, through their enforcement mechanisms and penalties for defection, institutions provide incentive structures and norms about proper conduct that guide behavior (cf. Hall and Rosemary 1996). In this sense, government institutions are vital to the management of a public good such as the environment, especially 'when people's behaviors fail to deliver the public good' (Kinzig *et al.* 2013, p. 164). Yet, the extent to which government institutions are effective in managing public goods should ultimately depend on whether these institutions are fair, effective and impartial (Rothstein 2013).

Second, government institutions not only promote environmental collective action through directly encouraging individuals' environmentally friendly behavior in the private sphere. Perhaps more relevant for the

concern–behavior relationship, the functioning of government institutions also shapes people’s expectations about the responsiveness and efficaciousness of government (Rothstein 2011). If people believe that government institutions are generally responsive, effective and uncorrupt, they should be more likely to engage in collective action in the public sphere, i.e., make efforts to influence politicians and policymakers in a pro-environmental direction (cf. Dalton *et al.* 2010).

Using multilevel analysis and survey data from the International Social Survey Programme (ISSP), we analyze the strength of the relationship between environmental concern and pro-environmental behaviors in the private and public sphere across 32 societies from different parts of the world. We also use macro-level data on the quality of institutions from the QoG database, which focus on the strength and impartiality of the legal system, corruption, and bureaucracy quality. In the following section, we review the literature on pro-environmental behavior and the relationship between environmental concern and these behaviors. We also review the literature on quality of government (QoG) and the relevant studies in the environmental literature focusing on QoG. We then present our hypotheses, data, and methods, followed by our results. Finally, we discuss our findings in relation to previous research and provide our main conclusions.

Theoretical framework and previous research

Pro-environmental behavior

The literature on pro-environmental behavior distinguishes between *private* and *public* sphere behaviors (Stern 2000). Whereas private sphere behaviors such as renewable energy use and sustainable consumption can have a direct and considerable impact when a majority of people simultaneously engages in them, public sphere behaviors such as protesting, petitioning or supporting environmental organizations have an indirect yet potentially substantial impact on a large number of people even if only a minority take part (Stern 2000, p. 409).

While international surveys show that environmental concern has dramatically increased across the globe during the last half of the 20th century (Dunlap *et al.* 1993, Dunlap and Mertig 1997) and that the majority of the population in many countries today are environmentally concerned (Franzen and Vogl 2013a), the share of the population that display high levels of commitment to actively protect the environment is substantially smaller. For instance, in a cross-national study using data from the International Social Survey Programme (ISSP) including over 30 countries, Hadler and Haller (2011, 2013) find that while there are considerable differences in behavior across countries, the levels of pro-environmental behavior in many countries are surprisingly low, especially with regard to public-

sphere behaviors. Similarly, Dalton (2005) finds that environmental group membership rates are generally low in most countries, with an average of about 5%, suggesting that citizens' overall environmental civic engagement (i.e., public sphere behavior) is quite modest in most parts of the world.

According to sociological and political science theory, civil society is often considered to be the primary source of large-scale social and political change (Sztompka 1993, Cohen and Arato 1994, Habermas 1996, Putnam 2000, Skocpol 2013). The central role ascribed to civil society is often based on the notion that it challenges existing worldviews and expands the range of available ideas and solutions to societal problems, thereby transforming existing social and political institutions (see also, Calhoun 1993, Tarrow and Tollefson 1994, Habermas 1996). As many scientists now agree that large-scale societal transformations are required in order to reverse the trend of climate change and global warming (IPCC 2018), providing better informed explanations about (the lack of) pro-environmental behavior in the public sphere is a crucial task for social scientists.

As the environment is a common good, rational individuals have incentives to defect from cooperation (Olson 1965, Hardin 1971, 1982, Ostrom 1998). As the cost of contributing to a common good such as the environment is often greater than the benefits, rational individuals are tempted to focus on their short-term self-interest and free ride on the environmental efforts of others (Lubell 2002; see also, Sønderskov 2008). In line with the logic of the well-known example of 'the prisoners dilemma' in game theory, the result is that everybody becomes worse off despite acting in their perceived self-interest. Furthermore, the fear that others will free ride very likely reinforces the tendency to defect from cooperation, since one's own contribution could be squandered if others defect in high numbers (Tam and Chan 2018). Hence, in the absence of information and cues suggesting that other people will cooperate, individuals are even more likely to defect from contributing to a common good, such as the environment.

This is in line with previous research showing that 'people will cooperate once they realize the importance of cooperation and are assured of other members' cooperation' (Yamagishi 1986: 115; see also, Fischbacher *et al.* 2001). Since collective action often involves cooperation among large number of strangers, individuals have to trust that others whom they do not know will also cooperate (Ostrom 1998, Rothstein 2005). Accordingly, several studies emphasize the importance of generalized trust (trust in strangers) in alleviating collective action problems and free riding in relation to the environment (Sønderskov 2008, 2011, Franzen and Vogl 2013b). For instance, Sønderskov (2011) shows that membership in environmental organizations is more common among individuals with higher levels of generalized trust. Since information about the behavior of other people appears essential for individuals' own environmental efforts, people not only have to be environmentally concerned

to engage in pro-environmental behavior; they also have to believe (i.e., trust) that others will cooperate.

The gap between environmental concern and pro-environmental behavior

Indeed, previous research identifies a conspicuous gap between environmental concern and pro-environmental behavior, showing that the concern–behavior relationship is often surprisingly weak (Scott and Willits 1994, Olli *et al.* 2001, Kollmuss and Agyeman 2002, Bamberg 2003, Kennedy *et al.* 2009). While several explanations have been proposed to account for the concern–behavior relationship, previous research puts a particular emphasis on the role of trust. The argument is that environmentally concerned citizens should be more likely to act on their concerns if they trust that others will also act pro-environmentally (cf. Franzen and Vogl 2013b). Previous research indeed shows that the relationship between environmental concern and pro-environmental behavior is stronger among individuals with higher levels of generalized trust (Sønderskov 2011, Tam and Chan 2018).

Comparative studies show that there are considerable cross-national differences in the strength of the relationship between environmental concern (as well as other environmental attitudes) and pro-environmental behavior (see, e.g., Aoyagi-Usui *et al.* 2003, Eom *et al.* 2016, Pisano and Lubell 2017, Tam and Chan 2017, Wright and Kljøn 1998). The cross-national variability in the strength of the concern–behavior relationship suggests that environmental collective action problems are more accentuated in certain countries, leading several scholars to explore the role of contextual factors tied to the national context. For instance, previous studies have linked the concern–behavior gap across countries to contextual factors such as the level of economic development (Pisano and Lubell 2017) and the degree of individualism (Eom *et al.* 2016).

More importantly here, a few studies focus on the role of trust at the country level. Whereas substantial differences in generalized trust exist between individuals within countries (see, e.g., Delhey and Newton 2005), the average levels of trust also vary substantially across countries (Bjørnskov 2007, Nannestad 2008). This has led scholars to focus on the influence of trust at the country level, extending beyond the trust of individuals, on the concern–behavior relationship. In fact, previous research shows that environmentally concerned individuals are less likely to engage in pro-environmental behavior in countries where the levels of generalized trust are low (Tam and Chan 2018, Johansson Sevä and Kulin 2018), thus supporting the notion that environmental collective action problems are more likely to emerge in low-trust settings. Some studies, however, find less clear

evidence regarding the influence of trust on the concern–behavior relationship (Smith and Mayer 2018). Nevertheless, these studies do not consider the broader institutional context, in terms of the functioning of government, and its consequences for pro-environmental behavior. Given that political institutions are often characterized as having crucial consequences for both human behavior (e.g., Hall and Rosemary 1996) and generalized trust (e.g., Rothstein and Stolle 2008), research on the link between environmental concern and pro-environmental behavior should pay increasing attention to the functioning of government.

The quality of government

A persistent idea in democratic theory and theories about social movements is that a strong civil society requires a strong and responsive state (see, e.g., Walzer 1991, Tarrow 1996). According to Foley and Edwards (1996, p. 48), social movements in civil society ‘build trust and habits of cooperation and civic action among their members. Where the political system is even minimally responsive, they can boost the vitality of civil and political society by mobilizing people and stimulating debate.’ The responsiveness of government and the political system thus seems to constitute a crucial prerequisite for civic action and cooperation. As a result, pro-environmental behavior, particularly in the public sphere, should depend on the accountability and responsiveness of government more generally.

An increasingly prominent perspective in the literature on good governance suggests that government accountability and responsiveness highly depend on the quality of government (QoG) and its institutions. In the QoG literature, high-quality government is characterized fair, effective and impartial (uncorrupt) political institutions (Rothstein and Teorell 2008, Holmberg *et al.* 2009, Rothstein 2011). While citizens expect political parties and representative institutions to be partisan and thus partial, they expect institutions that provide services and uphold the rules and laws to fairly, efficiently, and impartially implement democratically enacted policies (Rothstein 2009). The legal system, the police, and street-level bureaucrats, all maintain social order by sanctioning people who are untrustworthy and who break the rules. In this sense, public officials not only constitute representatives of the government in terms of upholding law and order; they also embody and convey institutionalized norms crucial to the moral fabric of society (Delhey and Newton 2005, Rothstein and Stolle 2008).

Based on the literature, a key outcome of high quality of government institutions is that they generate and maintain high levels of social capital and trust (Rothstein and Stolle 2008, Charron and Rothstein 2018; see also, Delhey and Newton 2005). For a long time, the social capital literature viewed social cohesion and trust as products of the civic culture, largely the

result of citizens' active engagement and participation in voluntary organizations (Putnam 2000, Fukuyama 2001). However, the results from empirical studies based on individual-level data contest this assumption, suggesting that the causality is reversed, as more trusting citizens tend to self-select into participation in voluntary associations (Stolle 1998, 2001, Brehm and Rahn 1997; see also, Rothstein 2011, Rothstein and Stolle 2008).

Previous studies have linked social capital variables such as generalized trust to pro-environmental behavior (e.g., Sønderskov 2008), and in particular the relationship between environmental concern and pro-environmental behavior (e.g., Tam and Chan 2018, Johansson Sevä and Kulin 2018). To account for cross-national differences in the concern-behavior relationship, these studies have primarily focused on generalized trust at the country level. However, according to the QoG literature, the mediating effects of generalized trust mainly operate at the individual level, as QoG is assumed to influence the trust of individuals and thereby how individual citizens perceive other citizens and their government (Rothstein and Stolle 2008). In a high QoG setting, where courts, the police and public officials all implement laws in a fair, efficient and uncorrupt manner, it becomes rational for individuals to trust not only that government will act efficaciously but also that other fellow citizens will abide by the laws and thereby generally be trustworthy (see also, Rothstein 2011). This means that while trusting individuals should be more likely to engage in collective action, for instance by engaging in pro-environmental behavior in the public sphere, it is unclear whether trust at the contextual level (i.e., country averages) have a unique impact over and beyond this individual-level effect.

At the country level, previous research suggests that high-quality government institutions have wider implications for collective action, especially for pro-environmental behavior in the public sphere, beyond increasing social trust. According to Knack (2002), high-quality government and a widespread sense of civic responsibility tend to go hand in hand, presumably because high-quality government institutions not only generate the trust necessary for citizens to cooperate but also because they generate and maintain norms about civic engagement and cooperation as essentially good. Furthermore, Levi (1991) argues that citizens will more likely look beyond their short-term self-interest and contribute to a public good if political institutions can be trusted to deliver what they are supposed to do. Citizens' attempts to affect policymaking should make particularly little sense if government institutions are inefficient, partial and corrupt. As a result, high-quality government institutions, in terms of fair, effective and impartial institutions, not only generate trust but also promote *norms* and *incentives* for cooperation, thus enabling citizens to more easily overcome social dilemmas (see also, Brehm and Rahn 1997, Levi 1998, Newton 2001, Rothstein 2003, Letki 2006).

Only a few studies on environmental attitudes and behavior focus on the role of QoG. One group of studies focusing on various environmental policy attitudes consistently finds positive effects of QoG on support for environmental policy. For instance, high-quality government, in terms of a lack of corruption, has been associated with more positive public perceptions about the effectiveness of environmental policy instruments (Harring 2014; see also, 2016). In another study, Kulin and Johansson Sevä (2019) find that people's normative views about government's responsibility for environmental protection are more likely to translate into support for government spending on the environment in high-QoG countries. In a study focusing specifically on the relationship between environmental concern and support for environmental taxes, Davidovic *et al.* (2020) find that people who are environmentally concerned are more willing to pay higher environmental taxes in high-QoG countries.

Meanwhile, few studies directly investigate the relationship between QoG and the pro-environmental behavior of ordinary citizens, and those that exist provide mixed findings. For instance, Harring *et al.* (2019) find consistent effects of government quality on self-reported recycling behavior, as people are more likely to report recycling in countries where government quality is high. In another study focusing on membership in environmental organizations, Torgler and García-Valiñas (2011) find that people are more likely to engage in environmental organizations if they perceive that government corruption is high. The authors explain these results by arguing that people are more likely to become engaged when government is perceived as weak and dysfunctional. While these results suggest that QoG can have very different consequences for specific pro-environmental behaviors, they cannot speak to the influences of QoG on pro-environmental behaviors in the public and private sphere more generally.

Hypotheses

The quality of government institutions should have important consequences for the extent to which citizens overcome environmental collective action problems and engage in pro-environmental behavior. However, due to the potential of high-quality government to alleviate collective action problems mainly in the public arena, the effect of QoG should be particularly salient with regard to public sphere behaviors and among citizens that are environmentally concerned in the first place.

H1 (direct effect): Individuals are more likely to engage in pro-environmental behavior in countries with high-quality government institutions.

H2 (moderating effect): The relationship between environmental concern and pro-environmental behavior should be stronger in high-QoG countries.

Data & method

In order to study citizens' pro-environmental behavior cross-nationally, we used individual-level data from International Social Survey Programme (ISSP). The samples are nationally representative for the adult population of 32 countries from all around the world, and from the year 2010. The countries included are (abbreviation in parenthesis): Argentina (AR), Austria (AT), Belgium (BE), Bulgaria (BG), Canada (CA), Chile (CL), Croatia (HR), Czech Republic (CZ), Denmark (DK), Finland (FI), France (FR), Germany (DE), Great Britain (GB), Israel (IL), Japan (JP), Korea (KR), Latvia (LV), Lithuania (LT), Mexico (MX), New Zealand (NZ), Norway (NO), Philippines (PH), Russia (RU), Slovakia (SK), Slovenia (SI), South Africa (ZA), Spain (ES), Sweden (SE), Switzerland (CH), Taiwan (TW), Turkey (TR), and the United States (US).

To measure pro-environmental behavior, we used a wide range of indicators tapping respondents' self-reported pro-environmental behaviors in both the private and public sphere. As measures of private sphere behaviors, we used the following five items: (I) 'How often do you' (I) 'sort glass, tins, plastic, or newspapers, and so on, for recycling'; (II) 'buy fruits and vegetables grown without pesticides or chemicals'; (III) 'reduce the energy or fuel you use at home for environmental reasons'; (IV) 'choose to save or re-use water for environmental reasons'; (V) 'avoid buying certain products for environmental reasons'. The item response alternatives are 'always' (1); 'often' (2); 'sometimes' (3); 'never' (4). We then recoded the variables so that higher values reflect a higher propensity to engage in each respective behavior.

As measures of public sphere behaviors, we used four indicators: whether the respondent (I) is a member of an environmental organization or group; and whether the respondent within the last five years has (II) signed a petition about an environmental issue; (III) given money to an environmental group; or (IV) taken part in a protest or demonstration about an environmental issue. Item response alternatives consist of 'yes' (1) and 'no' (2). In order to ensure that higher values reflect a higher propensity to engage in each respective behavior, we coded the variables so that 'yes' = 1 and 'no' = 0.

For the analyses, we used an additive index-approach (cf. Tam and Chan 2018). This strategy is supported by previous studies that have tested the reliability of these measures (e.g., Pisano and Lubell 2017, Tam and Chan 2018). With regard to private sphere behavior, we added the frequencies of each individual behavior so that the index reflects the cumulative engagement in these behaviors. With regard to public sphere behavior, we added the responses on each of the indicators (yes/no) so that the index reflects the number of behaviors that respondents engage in.

In order to study the individual-level relationship between environmental concern and pro-environmental behavior across national contexts, we used a measure of environmental concern based on an item asking respondents:

‘Generally speaking, how concerned are you about environmental issues?’ Item responses range from ‘not at all concerned’ (1), to ‘very concerned’ (5).

To measure the quality of government (QoG), we used an index from the International Country Risk Guide (ICRG), based on three components: corruption, law and order, and bureaucracy quality. With regard to corruption, the measure focuses on how corruption in the political system creates instability and undercuts the efficiency of government. With regard to law and order, the measure is based on the robustness and impartiality of the legal system as well as the implementation and enforcement of laws. The third component, bureaucracy quality, concerns the strength and autonomy of the administrative system providing public services. The QoG index ranges between 0 and 1, where scores close to 1 indicate higher government quality.

As previous research has linked environmental collective action problems to generalized trust (Johansson Sevä and Kulin 2018, Tam and Chan 2018), we also included two measures of trust in our analyses. To measure generalized trust, both at the individual and country level, we used a survey item asking respondents: ‘Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?’ Response alternatives range from 1 = ‘You can’t be too careful’ to 5 = ‘Most people can be trusted’. To measure generalized trust at the country-level, we calculated country averages based on individuals’ responses on this survey item.

Previous studies have also tied the concern–behavior relationship to economic prosperity (Pisano and Lubell 2017) and the degree of individualism (Eom *et al.* 2016), which suggests that these contextual factors also have to be taken into account. To measure economic prosperity, we used GDP data for the year 2010, retrieved from the World Bank (<https://data.worldbank.org>). To ensure cross-national comparability, we selected GDP per capita adjusted for purchasing power parities (PPP). In the analysis, GDP is reported in thousand US dollars. To measure Individualism, we used scores retrieved from Hofstede’s database on cultural dimensions (<https://geerthofstede.com/research-and-vsm/dimension-data-matrix>). Higher values on the Individualism index indicate a higher degree of individualism. To analyze the relationships between country-level determinants (QoG and other country-level controls) and individual-level variables (pro-environmental behavior and environmental concern), we use scatterplots and multilevel regression analysis (see, e.g., Hox *et al.* 2010).

Results

Before investigating the relationship between environmental concern and pro-environmental behavior, and its relation to QoG across countries, we examine the direct relationship between the QoG and pro-environmental behavior in the private and public sphere. To illustrate this relationship in

individual countries, we first use scatterplots. In [Figure 1](#), the QoG index (x-axis) is plotted against aggregate national levels of pro-environmental behaviors in the private sphere (y-axis). While the results suggest that private-sphere behaviors are generally more widespread in countries where QoG is comparably high, this relationship is relatively weak ($R^2 = .31$). In contrast, [Figure 2](#) shows that the relationship between QoG and pro-environmental behaviors in the public sphere is substantially stronger ($R^2 = .59$). The results in the plot show that public-sphere behaviors are considerably more common in high QoG countries such as Switzerland, New Zealand, Canada, Austria and the Nordic countries. These results are in line with hypothesis H1 as well as our tentative expectation that QoG will have comparably more important consequences for public-sphere behavior.

Turning to the moderating influence of QoG on the relationship between environmental concern and pro-environmental behavior, we present scatter plots where the QoG index is plotted against the country-specific correlation (Pearson's r) between environmental concern and pro-environmental behavior in the private ([Figure 3](#)) and public ([Figure 4](#)) sphere, respectively. The results demonstrate that while the relationship between QoG and the country-specific concern-behavior link with regard to private sphere behaviors is relatively weak ($R^2 = .31$), the strength of the concern-behavior link with regard to public sphere behaviors is in comparison more strongly related to QoG ($R^2 = .47$). The results show that the concern-behavior relationship

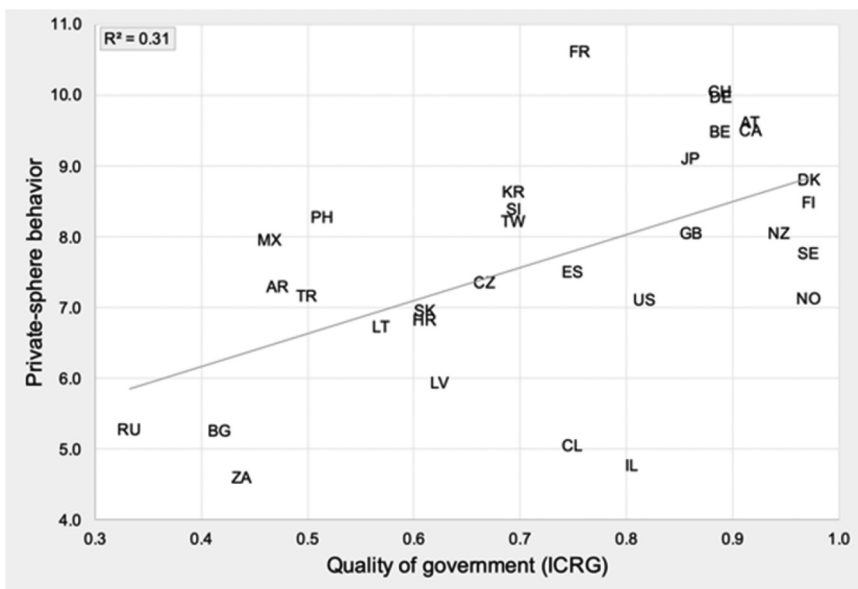


Figure 1. Quality of government (ICRG) and pro-environmental behavior in the private sphere.

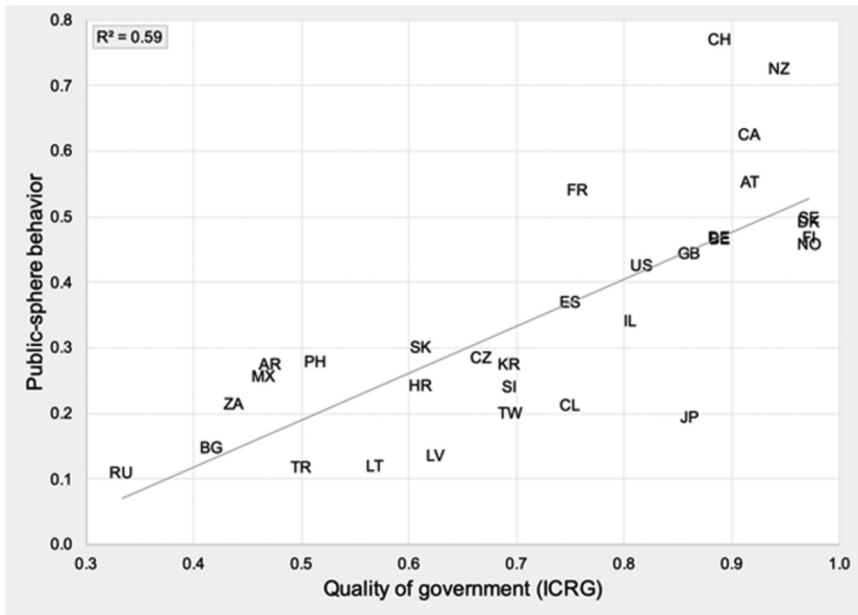


Figure 2. Quality of government (ICRG) and pro-environmental behavior in the public sphere.

involving public-sphere behavior is generally stronger in high-QoG countries such as New Zealand, Canada, and the Nordic countries. Hence, hypothesis H2 receives support for the concern–behavior relationship with regard to public sphere behavior but only weak support with regard to private sphere behavior.

We now proceed to our multilevel analysis with regard to the direct influence of QoG on pro-environmental behavior, as well as the moderating influence of QoG on the concern–behavior relationship. In a series of multilevel models (Model 1–Model 9) for each of the dependent variables for private-sphere behavior (Table 1) and public-sphere behavior (Table 2), we analyze these relationships using control variables at both the individual and country level.

Focusing on private-sphere behavior (Table 1), the results show that QoG has a statistically significant and positive effect ($b = 3.49$; $p < 0.001$) on these behaviors (M2). In line with our descriptive analysis, these results suggest that individuals in high QoG countries are more likely to engage in pro-environmental behavior in the private sphere. The results also show that this significant and positive effect persists under control for generalized trust levels (M3) and the degree of individualism (M5). Meanwhile, the QoG effect is not statistically significant when controlling for GDP (M4).

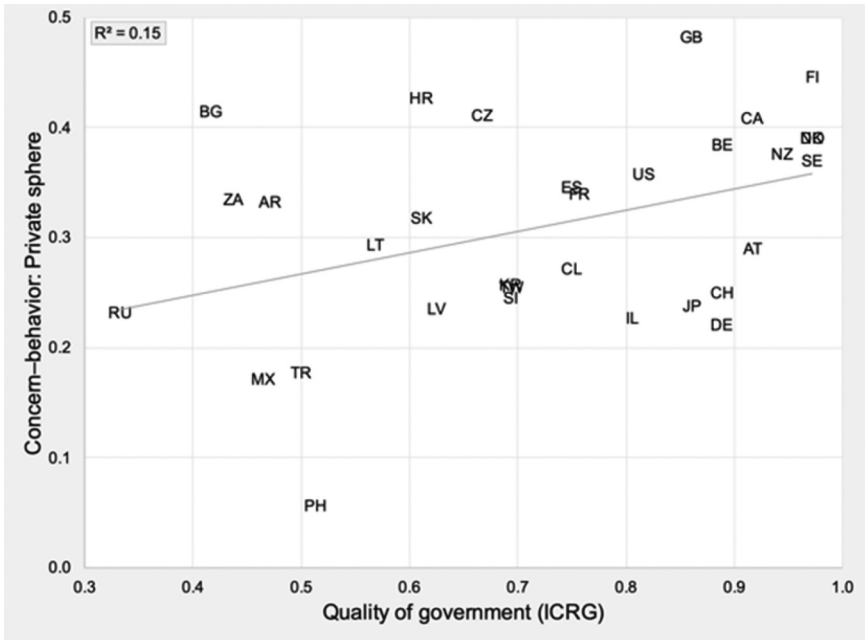


Figure 3. Quality of government (ICRG) and the concern-behavior relationship (private sphere).

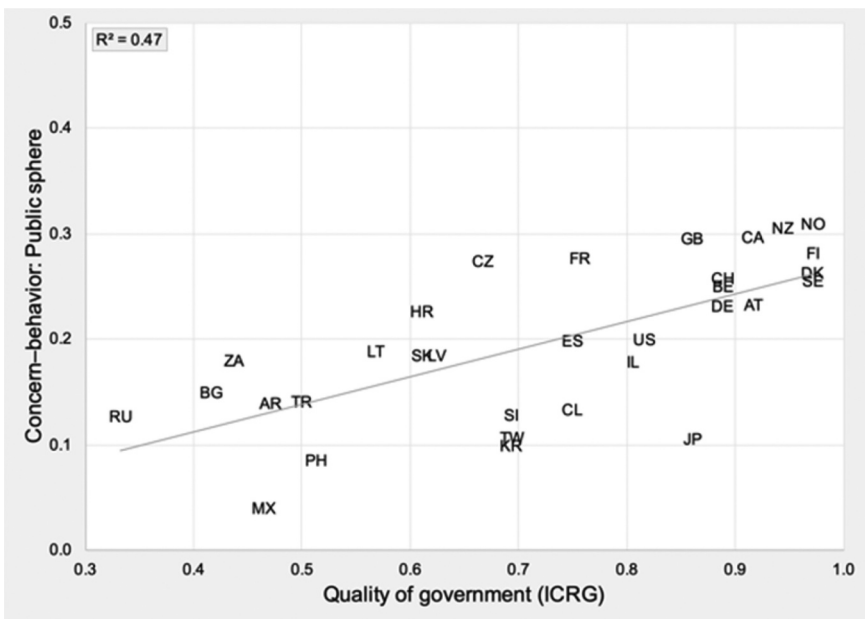


Figure 4. Quality of government (ICRG) and the concern-behavior relationship (public sphere).



Table 1. Multilevel analysis: Pro-environmental behavior in the private sphere.

	M1	M2	M3	M4	M5	M6	M7	M8	M9
	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)
<i>Individual-level variables</i>									
Sex (1 = woman)	0.597*** (0.032)	0.597*** (0.032)	0.597*** (0.032)	0.597*** (0.032)	0.597*** (0.032)	0.473*** (0.031)	0.481*** (0.031)	0.473*** (0.031)	0.473*** (0.031)
Age (years)	0.028*** (0.001)	0.028*** (0.001)	0.028*** (0.001)	0.028*** (0.001)	0.028*** (0.001)	0.025*** (0.001)	0.025*** (0.001)	0.025*** (0.001)	0.025*** (0.001)
Education (0–5)	0.275*** (0.012)	0.275*** (0.012)	0.275*** (0.012)	0.275*** (0.012)	0.275*** (0.012)	0.192*** (0.012)	0.185*** (0.012)	0.192*** (0.012)	0.192*** (0.012)
Environmental concern						0.603** (0.178)	0.446 (0.247)	0.631** (0.188)	0.560** (0.171)
Generalized trust			0.095*** (0.014)				–0.179*** (0.044)		
EC*Generalized trust							0.064*** (0.011)		
<i>Country-level variables</i>									
QoG		3.493** (1.101)	5.043** (1.715)	2.597 (1.952)	4.029*** (1.328)	1.967 (1.475)	4.077 (2.282)	1.659 (2.628)	3.392 (1.735)
Generalized trust			–0.873 (0.670)				–0.848 (0.892)		
GDP per capita				0.016 (0.029)				0.006 (0.039)	
Individualism					–0.008 (0.012)				–0.023 (0.016)
<i>Cross-level interactions</i>									
EC*QoG						0.356 (0.237)	0.046 (0.365)	0.197 (0.421)	0.083 (0.274)
EC*Generalized trust							0.082 (0.143)		
EC*GDP per capita								0.003 (0.006)	0.004 (0.002)
EC*Individualism									0.663 (1.083)
Intercept	4.573*** (0.246)	2.039* (0.828)	3.039** (1.156)	2.197* (0.872)	2.117* (0.828)	0.442 (1.107)	1.654 (1.542)	0.495 (1.172)	
<i>Random effects</i>									

(Continued)

Table 1. (Continued).

	M1	M2	M3	M4	M5	M6	M7	M8	M9
	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)
sd Env. concern									
sd residual	3.117*** (0.011)	3.117*** (0.011)	3.113*** (0.011)	3.117*** (0.011)	3.117*** (0.011)	0.236*** (0.033)	0.228*** (0.032)	0.235*** (0.033)	0.224*** (0.032)
sd intercept	1.334*** (0.168)	1.163*** (0.146)	1.135*** (0.143)	1.157*** (0.146)	1.154*** (0.145)	2.966*** (0.199)	2.963*** (0.194)	2.966*** (0.199)	2.966*** (0.193)
ICC	0.155*** (0.033)	0.122*** (0.027)	0.117*** (0.026)	0.121*** (0.027)	0.120*** (0.027)	0.210*** (0.043)	0.201*** (0.042)	0.210*** (0.043)	0.199*** (0.042)
Log likelihood	-97,444.2	-97,439.8	-96,307.0	-97,439.7	-97,439.6	-94,329.7	-93,460.0	-94,329.6	-94,327.3
<i>n</i>	38,095	38,095	37,667	38,095	38,095	37,588	37,259	37,588	37,588

Notes: M1 ... M9 = Model 1 ... Model 9; Dependent variable: Private sphere behavior index (0–15); ***p < 0.001; **p < 0.01; *p < 0.05; For all models, a total number of 32 countries were analyzed; EC = Environmental concern; In Model 1 (M1), we only include individual-level background variables sex, age and education. This model functions as a baseline model, providing information about cross-national variation in the dependent variable when no country-level variables are included; QoG (ICRG) scores ranges from 0–1, where values closer to 1 is indicative of high-quality government; Generalized trust was based on an item ranging from 1–5. Country-level trust was measured by aggregating individual-level trust into country averages; GDP per capita is adjusted for purchasing power parities (PPP), in thousand US dollars; Individualism scores are based on Hofstede's individualism/collectivism index, with values ranging between 0–100;

Table 2. Multilevel analysis: Pro-environmental behavior in the public sphere.

	M1	M2	M3	M4	M5	M6	M7	M8	M9
	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)
<i>Individual-level variables</i>									
Sex (1 = woman)	0.000 (0.007)	0.000 (0.007)	0.004 (0.007)	0.000 (0.007)	0.000 (0.007)	-0.018** (0.007)	-0.015* (0.007)	-0.018** (0.007)	-0.018** (0.007)
Age (years)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001** (0.000)	-0.001** (0.000)	-0.001** (0.000)	-0.001** (0.000)
Education (0-5)	0.091*** (0.002)	0.091*** (0.002)	0.084*** (0.002)	0.091*** (0.002)	0.091*** (0.002)	0.079*** (0.002)	0.073*** (0.002)	0.079*** (0.002)	0.079*** (0.002)
Environmental concern						-0.127*** (0.028)	-0.198*** (0.037)	-0.105*** (0.028)	-0.147*** (0.024)
Generalized trust			0.050*** (0.003)				-0.059*** (0.009)		
EC*Generalized trust							0.028*** (0.002)		
<i>Country-level variables</i>									
QoG		0.648*** (0.119)	0.562** (0.186)	0.558** (0.211)	0.497*** (0.136)	-0.663*** (0.091)	-0.374** (0.121)	-0.324* (0.146)	-0.459*** (0.094)
Generalized trust			0.004 (0.072)						
GDP per capita				0.002 (0.003)				-0.006** (0.002)	
Individualism					0.002 (0.001)				-0.004*** (0.001)
<i>Cross-level interactions</i>									
EC*QoG						0.356*** (0.038)	0.232*** (0.053)	0.236*** (0.064)	0.256*** (0.038)
EC*Generalized trust							0.033 (0.021)		
EC*GDP per capita								0.002* (0.001)	
EC*individualism									0.002*** (0.000)
Intercept	0.107*** (0.036)	-0.362*** (0.119)	-0.408** (0.126)	-0.346*** (0.003)	-0.384*** (0.086)	0.169* (0.067)	0.337*** (0.090)	0.105 (0.064)	0.224*** (0.062)
<i>Random effects</i>									

(Continued)

Table 2. (Continued).

	M1	M2	M3	M4	M5	M6	M7	M8	M9
	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)	(std e)
sd Env. concern									
sd residual	0.708*** (0.002)	0.708*** (0.002)	0.704*** (0.002)	0.708*** (0.002)	0.708*** (0.002)	0.693*** (0.002)	0.689*** (0.002)	0.693*** (0.002)	0.693*** (0.002)
sd intercept	0.174*** (0.022)	0.124*** (0.016)	0.122*** (0.016)	0.124*** (0.016)	0.117*** (0.015)	0.068*** (0.017)	0.055*** (0.015)	0.053*** (0.017)	0.054*** (0.014)
ICC	0.057 (0.014)	0.030 (0.007)	0.029 (0.002)	0.030 (0.007)	0.027 (0.007)	0.010 (0.005)	0.006 (0.003)	0.006 (0.004)	0.006 (0.003)
Log likelihood	-46,461.7	-46,451.2	-45,695.0	-46,451.0	-46,449.4	-44,917.2	-44,244.8	-44,913.1	-44,903.5
<i>n</i>	43,238	43,238	42,734	43,238	43,238	42,596	42,218	42,596	42,596

Notes: M1 ... M9 = Model 1 ... Model 9; Dependent variable: Public sphere behavior index (0–4); ***p < 0.001; **p < 0.01; *p < 0.05; For all models, a total number of 32 countries were analyzed; EC = Environmental concern; In Model 1 (M1), we only include individual-level background variables sex, age and education. This model functions as a baseline model, providing information about cross-national variation in the dependent variable when no country-level variables are included; QoG (ICRG) scores ranges from 0–1, where values closer to 1 is indicative of high-quality government; Generalized trust was based on an item ranging from 1–5. Country-level trust was measured by aggregating individual-level trust into country averages; GDP per capita is adjusted for purchasing power parities (PPP), in thousand US dollars; Individualism scores are based on Hofstede’s individualism/collectivism index, with values ranging between 0–100;

However, none of the country-level controls have statistically significant effects on private-sphere behavior with QoG in the same model. Given these results, we refrain from concluding that hypothesis H1 receives full support.

With regard to the moderating influence of QoG on the individual-level relationship between environmental concern and private-sphere behavior, we find no statistically significant cross-level interaction effect. In fact, none of the country-level variables appear to moderate the concern–behavior relationship with regard to private-sphere behavior. The only statistically significant moderating effect is the individual-level interaction between generalized trust and environmental concern ($b = 0.064$; $p < 0.001$). Hence, environmentally concerned individuals who are more trusting are also more likely to engage in private-sphere behaviors, such as environmentally friendly consumption and energy/water conservation. As a result, hypothesis H2 receives no support with regard to the relationship between environmental concern and private-sphere behavior.

Turning to public-sphere behavior (Table 2), the results show that QoG has a statistically significant and positive effect ($b = 0.648$; $p < 0.001$) on these behaviors (M2). These results suggest that individuals in high-QoG countries are generally more likely to engage in pro-environmental behavior in the

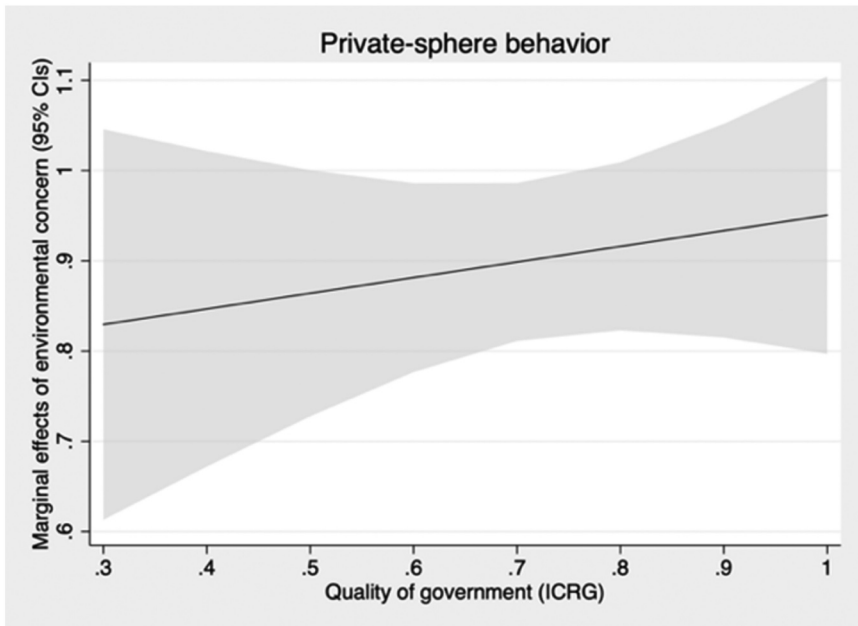


Figure 5. Marginal effects of environmental concern on private-sphere behavior at different levels of quality of government (ICRG).

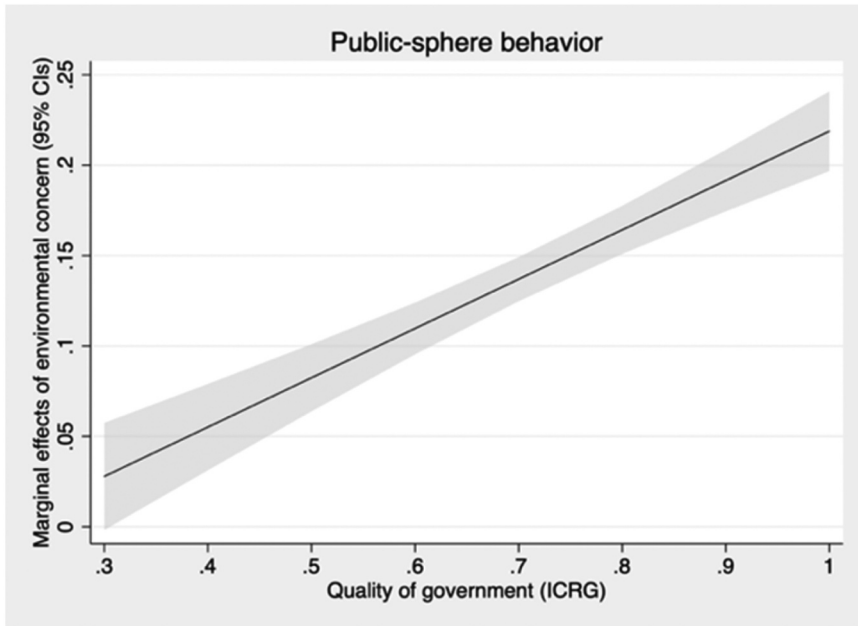


Figure 6. Marginal effects of environmental concern on public-sphere behavior at different levels of quality of government (ICRG).

public sphere. The results also show that this significant and positive effect persists under control for all country-level controls (M3–M5), suggesting that hypothesis H1 receives full support with regard to public sphere behavior. Moreover, none of the direct effects of the country-level control variables were statistically significant when included simultaneously with QoG.

With regard to the moderating influence of QoG on the individual-level relationship between environmental concern and public-sphere behavior, we consistently find a positive and statistically significant cross-level interaction effect in Model 6 with only QoG ($b = 0.356$; $p < 0.001$) as well as all models with country-level controls (M7–M9). Based on the reduction in the ICC, Model 6 explains a considerably larger share of the cross-national variation in public sphere behavior compared to the models without cross-level interaction effects. With regard to the relationship between environmental concern and public-sphere behavior, hypothesis H2 receives full support.

It should be noted that both GDP and Individualism have positive and statistically significant moderating effects. We did not, however, find any evidence of a moderating effect of generalized trust at the country level. Yet, the individual-level interaction between environmental concern and generalized trust is positive and statistically significant ($b = 0.028$; $p < 0.001$). Finally, based on the effect sizes and the explained country-level variance (ICC), QoG

appears to be the most influential factor in explaining both cross-national differences in public-sphere behavior as well as the concern-behavior link with regard to public sphere behavior.

To graphically illustrate the main results from [Tables 1](#) and [2](#) (Model 6), we present the marginal effects of environmental concern at different levels of QoG, in [Figure 5](#) and [Figure 6](#). The figures clearly visualize our main findings that while the effects of environmental concern on private sphere behavior do not appear to differ significantly at various levels of QoG, the conditional effect of environmental concern on pro-environmental behavior in the public sphere appears to be closely related to QoG levels

Discussion

In this study, we focused on the quality of government as an important contextual factor influencing pro-environmental behavior and the concern-behavior relationship cross-nationally. With regard to the first hypothesis about direct effects of QoG (H1), our results showed that pro-environmental behavior in both the private and public sphere appear more widespread in high-QoG countries, although the results were less robust for private sphere behavior. We found a clear relationship between QoG and the concern-behavior link with regard to public sphere behavior. However, we did not find evidence of a moderating influence of QoG with regard to private sphere behavior. While these results provided mixed support for our second hypothesis regarding the moderating influence of QoG (H2), they were in line with our theoretical argument that environmental collective action problems are more likely to emerge in relation to public-sphere behaviors, which to a greater extent than private sphere behavior involve cooperation among citizens.

In contrast to previous studies that has tied generalized trust at the country level to the strength of the concern-behavior relationship cross-nationally (e.g., [Tam and Chan 2018](#), [Johansson Sevä and Kulin 2018](#)), we found no evidence of such an interaction effect. Our results therefore challenge the notion that cross-national differences in generalized trust explain the concern-behavior gap across countries.

Instead, our results suggest that while generalized trust is a key outcome of high-quality government institutions ([Rothstein and Stolle 2008](#), [Rothstein 2011](#), [Charron and Rothstein 2018](#)), it operates mainly at the individual level. Indeed, our results demonstrate that generalized trust at the individual level moderates the concern-behavior relationship. However, this individual-level moderation does not explain the relatively large cross-national differences in the concern-behavior relationship with regard to public sphere behavior. However, given the relationship between QoG and trust, and that previous studies have not incorporated QoG in their analyses ([Tam and Chan 2018](#),

Johansson Sevä and Kulin 2018), it is not surprising that trust levels have been tied to the strength of the concern–behavior relationship across countries.

The precise mechanisms tying QoG to pro-environmental behavior and the concern–behavior relationship remain somewhat elusive. However, based on our results, high-quality government institutions appear to have wider implications for environmental collective action beyond increasing the social trust among individuals. For instance, QoG very likely promote cooperation through the strengthening of social cohesion and social capital more broadly, as well as facilitating civic norms about collective action in response to common challenges such as environmental problems. In particular, the responsiveness of high-quality government very likely constitutes a decisive determining factor in citizens' choices of whether or not to engage in pro-environmental behavior in the public sphere.

Based on our inconclusive results regarding private sphere behavior, future studies should devote increasing attention to cross-national differences in the concern-behavior link with regard to these behaviors. If none of the contextual factors studied here can explain cross-national differences in the extent to which environmental concern is translated into private-sphere behaviors, then what does? Recent research suggests that opportunity and incentive structures might fare better in explaining the concern-behavior link with regard to private-sphere behaviors (Pisano and Lubell, 2017), yet further studies are needed in order to account for cross-national differences in this regard.

The fact that we did not find a relationship between any of the contextual factors and the concern-behavior link with regard to private sphere-behaviors could also be due to limitations with regard to our data. For instance, while most behaviors included in the ISSP have a considerable environmental impact, several critical behaviors are not included, such as air travel and meat consumption. Future studies should therefore aim to study these relationships by including a more comprehensive set of private-sphere behaviors.

It should also be noted that we use self-reported behaviors as measures of actual behaviors, which can sometimes introduce bias due to rationalizing and over-reporting. However, meta-analyses have shown that self-reported pro-environmental behaviors generally do not suffer from these limitations as they are highly correlated with actual behaviors (Kormos and Gifford 2014). Furthermore, since our focus is on covariance between explanatory factors and pro-environmental behavior rather than on absolute levels of behavior, such limitations (to the extent that they exist) should have relatively minimal implications for our results.

Finally, we believe that this study constitutes a crucial contribution to the literature on pro-environmental behavior, as it demonstrates that the quality of government institutions plays a crucial role in promoting pro-environmental behavior and overcoming environmental collective action dilemmas. Above all,

our findings suggest that improving the quality of government institutions can foster a more civically engaged citizenry, which in turn can push societies to step up their environmental and climate efforts. However, abolishing corruption and inefficiency in government hardly constitute a small and easy task. Our results therefore suggest that environmentally concerned people, which constitute a majority in most countries, will still not substantially increase their pro-environmental efforts if the quality of their government's institutions is low.

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ORCID

Joakim Kulin  <http://orcid.org/0000-0002-7610-9104>

Ingemar Johansson Sevä  <http://orcid.org/0000-0003-3349-5778>

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