

Inhibiting or Contributing? How Global Liberal Forces Impact Climate Change Skepticism

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ABSTRACT

Although climate change remains a top environmental threat, significant portions of the global population continue to exhibit climate change skepticism. Currently, an extensive literature identifies the micro-level determinants of climate skepticism, often manifesting as a form of populist “backlash” to the adverse effects of globalization. However, the potential of macro-level global cultural forces—particularly embeddedness in liberal world society—to counter such push-back is unclear. Using multilevel modeling to analyze International Social Survey Program data spanning 37 countries from 2000 to 2020, we find that in general, increased embeddedness is linked to reduced climate skepticism. However, when global liberal forces encounter anti-liberal undercurrents within nation-states, a situation we refer to as cultural dissonance, the impact of liberal world society on tempering skepticism varies. Embeddedness mitigates skepticism at the national level, particularly within authoritarian regimes, but not at the individual level, especially among right-wing individuals. Paradoxically, world society also heightens ideological polarization of individual worldviews on climate change. By illuminating the contradictory role of liberal world society, which simultaneously exacerbates and inhibits anti-liberal, populist attitudes about climate change, we advance existing work examining the post-liberal turn and holds promise for making sense of other issue domains where liberal perspectives are contested.

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Since the 1970s, a global environmental regime, legitimated by scientific theories and supported by international treaties and organizations, has emerged and rapidly expanded (Hironaka 2014). Today, nearly every nation-state possesses some form of domestic environmental framework and is party to multilateral environmental negotiations. For instance, the 2015 Paris Agreement, a legally binding international treaty on climate change, was almost universally adopted, with 195 signatories as of 2023.¹ Public and educational campaigns since the 1980s have additionally raised awareness and knowledge about environmental change and its harmful effects (Bromley, Meyer, and

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Ramirez 2011). Yet, despite longstanding pro-environmentalism in the liberal world order, by the late-2000s, climate change and environmental degradation became a battleground for local, national, and global forces as growing public doubt about environmental trends became apparent (Capstick et al. 2015). Today, sizeable proportions of citizens around the world exhibit skepticism toward scientific claims of climate change, a top environmental threat (Zhou 2015).

Environmental and climate skepticism forms part of a broader landscape of populist contestations of previously established global liberal norms and frameworks (Cole, Schofer, and Velasco 2023; Jepperson and Meyer 2021). Widely depicted as “globalization backlash,” these contestations have surged worldwide since the 2000s. Consequently, recent studies examine how economic instability and political cleavages triggered by globalization contribute to climate skepticism (Buzogány and Mohamad-Klotzbach 2021; Meyer 2022). While these scholars emphasize the global factors enabling climate skepticism, their potential to counteract such attitudes remains unexplored. World society research notably demonstrates that linkages with global cultural frameworks foster liberally grounded environmental values (Frank, Hironaka and Schofer 2000; Hironaka 2014). However, few, if any, investigate whether these linkages inhibit *anti*-liberal populist sentiments—of which climate skepticism is one manifestation. Indeed, climate skepticism is largely driven by distrust in global liberal institutions, elites, and scientists advancing the climate-change agenda (Huber, Greussing, and Eberl 2022). Still, we know very little about the extent to which liberal global forces mitigate climate skepticism, particularly amidst nascent illiberalism.

In line with the world society scholarship, we locate the global liberal forces in a range of institutional structures (e.g., international governmental and non-governmental organizations and treaties) that emerged in the post-1945 era. These institutional structures supported and spread cultural models of society organized around liberal values. While they are still in place, the liberal cultural frameworks they embody are increasingly challenged by flourishing autocratic regimes, social movements, and advocacy groups, which foster illiberal alternatives and organize nationally and globally (Cole, Schofer, and Meyer 2024; Lerch, Frank, and Schofer 2024; Velasco 2020). The mounting tension between liberal and anti-liberal forces constitutes the backdrop for our analysis of climate skepticism.

Using three waves of data on 37 countries from the International Social Survey Program (ISSP) conducted between 2000 and 2020, we employ multilevel modeling to evaluate the link between nations’ embeddedness within global liberal institutional frameworks and individual climate skepticism—both generally, and amid illiberal push-back. Controlling for various political, economic, and socio-demographic characteristics, we find that global liberal embeddedness is linked to reduced skepticism. Yet when liberal and anti-liberal forces interact, a situation we refer to as “cultural dissonance,” the ability of liberalism to counteract illiberalism varies by the level at which dissonance occurs. At the national level, in more authoritarian contexts, embeddedness is associated with lower individual skepticism. However, on an individual level, among right-wing respondents, individual skepticism persists regardless of embeddedness. Moreover, when dissonance is high, liberal influences further heighten polarization of individual

worldviews on climate change. Thus, although global liberal frameworks remain a stalwart against rising illiberalism, they are not impervious. In fact, liberal forces may paradoxically empower right-wing individuals to maintain their climate skeptic beliefs against a growing contingent of pro-climate liberals and moderates, further exacerbating ideological divisions. In developing cultural dissonance as an analytical angle, this paper pushes existing research forward by introducing a new framework to study individual contestations of liberal narratives not only in relation to the environment and climate change, but also the broader liberal agenda and its offshoots. Results provide insights about which factors aggravate or reduce the mounting tension between liberal and anti-liberal forces, and under which conditions, in turn shedding new light on how to best foster widespread support for pro-environment and climate change narratives.

Explaining climate skepticism

We understand climate skepticism as suspicion toward scientific claims that validate the authenticity, causation, and consequences of climate change as an environmental threat (see Capstick and Pidgeon (2014)). Although it has mostly leveled off since 2010 and in some places, slightly declined, climate skepticism remains a prominent global stance (Capstick et al. 2015). Extrapolating from ISSSP cross-national surveys, Figure 1 indicates that, on average, almost one third (30 percent) of respondents agree that “many claims about environmental threats are exaggerated,” with skepticism rising slightly between 2000 and 2010, then declining in 2020. Although national differences exist (Figure 2)—with the mean proportion of respondents expressing climate skepticism in 2020 ranging anywhere from 0.12 in Japan to over 0.53 in the Philippines—climate skepticism remains globally ubiquitous, appearing even within conventionally liberal Western nations such as the United States, Australia, and France at surprisingly high values (approximately 0.38).

What explains climate skepticism? Current literature identifies several micro-level factors, finding that older, male, less educated, and politically conservative individuals are more likely to question climate change (McCright and Dunlap 2011; Poortinga et al. 2019; Tranter and Booth 2015; Zhou 2015). Lower socioeconomic

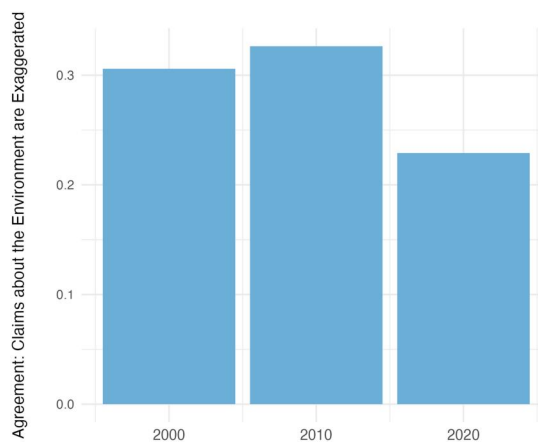


Figure 1. Average climate skepticism by year, ISSP.

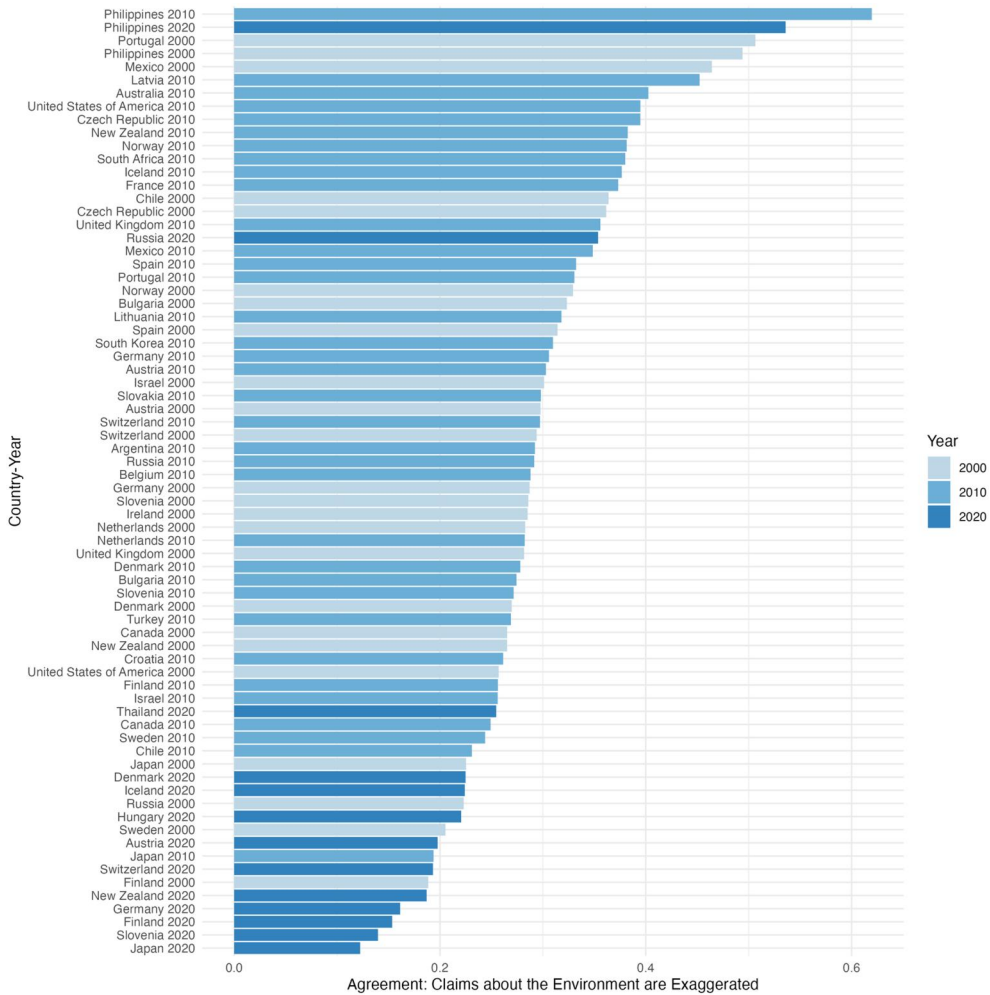


Figure 2. Climate skepticism by country-year.

status and rural residence (Lübke 2022; Poortinga et al. 2011), religious affiliation (Morrison, Duncan, and Parton 2015), and less consistently, religiosity (Haltinner and Sarathchandra 2022) are also linked to greater skepticism. In psychology, scholars attribute increased skepticism to individualistic traits (Kahan, Jenkins-Smith, and Braman 2011; Wang and Kim 2018), confirmation bias (Whitmarsh 2011), and having traditional as opposed to self-transcendent values (Poortinga et al. 2011). Together, these findings set the foundation for understanding the micro-level determinants of climate change attitudes.

However, as Figure 2 suggests, climate skepticism is a global phenomenon. Thus, we expect that broader contextual factors, global in scope, are also at play. Recent studies begin to acknowledge this by theorizing about climate skepticism in the context of global economic and political developments. They argue that climate skepticism is a symptom of a broader, macro-level backlash against economic (Rodrik 2011) and societal globalization (Gidron and Hall 2020; Norris and Inglehart 2019)

among those who have been “left behind” by these processes (Lockwood 2018). Encouraged and amplified by right-wing populist rhetoric, this, in turn, fosters hostility toward the mainstream “cosmopolitan elite agenda”—of which climate change mitigation is a key component (Buzogány and Mohamad-Klotzbach 2021; Forchtner 2019). This issue convergence between climate skepticism and broader illiberal populism may be driven in part by what social movements scholars refer to as frame transformation (Snow, Vliegenthart, and Ketelaars 2019). In this scenario, climate skepticism may emanate from the reframing and reversal of pro-climate narratives and related liberal perspectives in support of illiberal counternarratives. Under these circumstances, people who subscribe to these narratives become distrustful of climate science and policies while questioning their credibility, resulting in climate skepticism. Empirical evidence supports this explanation. For example, a survey of twenty European countries finds that individuals who feel insecure about their economic futures or live in an economically precarious region are more likely to deny climate change (Lübke 2022). In the US, both national (Meyer 2022) and local (Benegal 2018) unemployment is linked to reduced belief in climate change, particularly after global economic downturns or shocks (e.g., the Great Recession). Individuals endorsing right-wing populist ideologies (Kulin et al. 2021) and expressing low trust in the government and science (Tranter and Booth 2015; Zhou 2015) are also more likely to be climate skeptics.

Nevertheless, this exploration of how backlash against globalization contributes to anti-climate change stances offers only a partial snapshot. In addition to the effects of global *economic* forces, we suspect that global *cultural* forces also contribute to individual environmental and climate orientations. In fact, a long history of sociological scholarship—often referred to as world society theory—validates this premise.

World society, global liberal culture, and its effect on climate skepticism

Broadly speaking, world society scholarship theorizes and empirically documents how global culture spreads (Schofer et al. 2012). Over the last several decades, countless studies have demonstrated not only the existence of a liberal world culture since the end of WWII, but also its widespread diffusion. This process, world society scholars argue, is particularly likely among countries exhibiting high *embeddedness*, or linkages, to a broad contingent of global actors and institutions (e.g., INGOs, IGOs, and international treaties) which facilitate the flow of global culture to national contexts. Global embeddedness has been historically attributed to the integration of liberal norms into nations’ policies, practices, and opinions across numerous subject areas such as women’s rights, human rights, science, education, and environmentalism (Boyle, McMorris, and Gómez 2002; Drori et al. 2003; Hironaka 2014; Kim 2020b; Meyer, Ramirez, and Soysal 1992; Ramirez, Soysal, and Shanahan 1997; Schofer 2004).

Regarding the environment, integration into world society and the liberal cultural framework it supports is associated with more environmentally friendly policies (Longhofer et al. 2016) as well as the proliferation of national parks, environmental impact assessment laws, environmental ministries, and domestic environmental associations (Frank et al. 2000; Hironaka 2002; Longhofer and Schofer 2010). Similar effects

have been found in relation to practices. Whether measured as a reduction in carbon emissions, deforestation, or chemical fertilizer and pesticide use, studies repeatedly illustrate liberal world society's capacity for improving environmental outcomes (Jorgenson 2009; Longhofer and Jorgenson 2017; Schofer and Hironaka 2005; Shorette 2012). At the individual level, world society integration is also linked to increased environmental concern Givens and Jorgenson (2013) and action (e.g., recycling and protesting) (Hadler and Haller 2011; Hadler 2016).

Thus, considering world society's ability to diffuse liberal pro-environmental norms and attitudes, it is reasonable that world society integration would also make it more difficult for narratives opposing climate science and environmentalism to take root. We hypothesize that:

H1: People living in nations highly embedded within world society will exhibit lower climate skepticism.

However, world society and its culture are not inherently liberal. Whether by emergent anti-liberal international organizations and advocacy or increased funding restrictions on NGOs—the long-hypothesized carriers of liberal culture—the liberal model is being increasingly challenged (Bromley, Schofer, and Longhofer 2020; Cupać and Ebetürk 2022; Glasius, Schalk, and De Lange 2020). Attacks on higher education and science (Bromley et al. 2023; Schofer, Lerch, and Meyer 2022; Zapp 2022), reduced women's participation in public life (Lerch et al. 2021), LGBT+ repression (Hadler and Symons 2018; Velasco 2020), and the deterioration of democracy (Diamond 2015) further point to a declining liberal international order and rising global illiberalism (Ikenberry 2018). Defined by Laruelle (2022:304), this illiberalism is a new, doctrinally fluid and context-based, yet relatively coherent “ideological universe” representing “backlash against today's [international] liberalism in all its varied scripts.”² Indeed, just as global liberal forces historically contribute to the homogenization of policies, practices, attitudes, and behaviors across nations, so too do their illiberal counterparts. Only now, nations around the world are increasingly endorsing a package of distinctly anti-liberal values, with illiberal global forces being linked to increased vaccine hesitancy (Cole et al. 2023), greater disrespect for human rights (Cole et al. 2024), decreased women's legislative representation (Mejia 2024), and declining academic freedom (Lerch et al. 2024). Such a perspective also aligns with discussions in the social movements literature regarding a process known as frame articulation, whereby different cultural items—such as climate skepticism and anti-elite illiberalism—are meaningfully “spliced” together to create a new, coherent lens through which the social world can be (re)interpreted (Benford and Snow 2000; Walgrave and Manssens 2005). Once constructed, these new cultural frames can be used to transform and even directly contradict prevailing cultural notions (Snow et al. 2019). This process may be particularly acute amidst rising illiberal forces within world society (Cole et al. 2024; Mejia 2024).

Given these trends, although existing research shows how integration into the liberal world order expedites pro-environmentalism, its ability to hinder climate skepticism amidst anti-liberal pushback remains unclear. Does embeddedness within liberal world society insulate individuals against the rising tide of illiberalism? Or does anti-liberal backlash override its effects?

Cultural dissonance as pathways to climate skepticism

The waning dominance of the liberal order in the face of anti-liberal contestations is now widely acknowledged. However, the ways in which these concurrent yet conflicting cultural forces *clash* or *interact* with one another are underexplored. We expand upon existing research by focusing on the mounting tension between liberal and illiberal forces—a phenomenon we refer to as *cultural dissonance*—and the outcomes they produce. By examining the extent to which liberal global forces withstand illiberal ideologies and cultural orientations within nation-states, both at the country and individual levels, we shed new light on how and under what circumstances populist contestations (manifesting as climate skepticism) weaken.

Country: dissonance in more authoritarian regimes

One way cultural dissonance manifests is at the *country* level. Unlike democracy, which constitutes the core of the liberal international order and world society (Ikenberry 2018; Kim 2020a), authoritarianism directly contradicts liberal norms—prioritizing authority over freedom and individualism; status-quo and tradition over universalism and progress (Cooley 2015). Since the mid-2000s, authoritarianism and its related norms have gained traction and legitimacy (Diamond 2015), producing cultural tensions, or dissonance, between the liberal and illiberal models across several issue areas, including the environment and climate change. Whereas democracy³ is associated with greater environmentalism (Inglehart 1990; Marquart-Pyatt 2012), right-wing, authoritarian politics are linked to anti-environmentalism (Gemenis, Katsanidou, and Vasilopoulou 2012) and climate skepticism (Forchtner 2019). In addition to using climate change denial rhetoric—both as a political tool and an anti-liberal signaling device (Zehndorfer 2022)—authoritarian leaders are also more likely to demonize, delegitimize, or otherwise silence pro-climate change scientists and narratives that threaten their authority (Żuk and Szulecki 2020). For example, Tynkkynen and Tynkkynen (2018) show the link between the expansion of authoritarianism in Russia and its increased use of public climate denial discourse over the last decade as a means of upholding the status quo.

Given these trends, we suspect the link between liberal world society on climate skepticism depends on regime score. As liberal global linkages increase, so too do the pathways through which liberal narratives can flow. When this happens, cultural dissonance in more authoritarian settings will be relatively high; in more democratic settings, it will be relatively low. We believe this level of dissonance conditions the association between world society on individual attitudes. Specifically, we anticipate that liberal global forces more effectively reduce climate skepticism within more authoritarian contexts compared to relatively democratic contexts, resulting from greater cultural dissonance. Indeed, prior studies show that a nation's "ideological profile"—roughly designated as "Left" (more democratic) or "Right" (more authoritarian)—predicates citizens' openness to liberal narratives (Cole 2023; Kim and Fallon 2023). We suspect similar conditionality here.

On one hand, within more authoritarian contexts, increased connections to liberal world society should uniquely expose and acclimatize citizens to alternative and possibly

otherwise censored liberal perspectives concerning climate change. These connections should additionally offer the essential resources, information, and support that empower citizens to engage in critical dialogue about environmental concerns (Finnemore and Sikkink 1998; Keck and Sikkink 1999), reducing climate skepticism. On the other, because greater democracy is linked to higher endorsement of environmental norms and agreements (Neumayer 2002) and better supports open dialogue through which civil society organizations can increase public awareness about (and belief in) climate change (Povitkina 2018), individuals in more democratic spaces are already socialized to liberal narratives—often regardless of liberal world society. Consequently, additional world society linkages may do little to boost already abundant pro-climate change positions when cultural dissonance is low.

In sum: when dissonance is higher, the ability of liberal global forces to *counteract* national-level illiberal cultural forces and therefore *drown out* climate skeptic narratives will be greater. When dissonance is lower, liberal global pressures will make little difference because liberal cultural norms are already pervasive. We therefore hypothesize:

H2a: World society embeddedness is linked to lower climate skepticism within more authoritarian contexts.

H2b: World society embeddedness is not significantly linked to climate skepticism within more democratic contexts.

Individual: dissonance among right-wingers

We also expect that cultural dissonance at the *individual* level is linked to climate attitudes. Recent studies show how the expansion and intensification of liberal world society can empower local opposition, in turn, triggering polarization between liberal and anti-liberal world views on issues such as climate, vaccination, and science (Cole et al. 2023; Koopmans and Zürn 2019; Zapp 2022). According to world society scholarship, this polarization can be partially explained by the triumph of the “hyper-empowerment” of individuals through the neo-liberal transformations of global cultural frameworks and their diffusion (Cole et al. 2023; Lerch et al. 2017; Lerch, Bromley, and Meyer 2022). Manifesting within individuals who regard themselves as agentic, capable, self-assured, and overconfident of their own beliefs, this hyper-empowerment becomes “a disruptive force, even to the point of challenging the liberal order from within,” as it grounds mistrust and dismissal of expert and scientific knowledge and broadly liberal institutions (Cole et al. 2023:24).

Psychological studies of this phenomenon draw similar conclusions, finding that overconfident individuals who “overestimate their knowledge and ability” and are easily persuaded by unsubstantiated claims (e.g., climate change denial) are more likely to express populist sentiments, such as climate skepticism (Rico, Guinjoan, and Anduiza 2020:805, van Prooijen et al. 2022). This phenomenon may be particularly rife amidst a changing global order. As illiberal cultural models gain traction and spread, so too do their associated norms and narratives, leading to a global resurgence of the traditional values agenda (Cooley 2015) and illiberal, right-wing

political ideologies (Doval and Souroujon 2021; Laruelle 2022)—both of which should reinforce distrust in liberal actors and their scripts.

In such a context, we expect cultural dissonance at the individual level to sustain anti-climate-change positions. Specifically, we anticipate that individuals with anti-liberal leanings will “dig their heels in” when exposed to liberal world society frameworks. When inundated with pressures from what they perceive to be “the elite establishment,” these individuals will cling to preexisting beliefs, which reinforce and rationalize their perspective. This comports with existing studies, which find that individuals expressing right-wing populist ideologies (Kulin et al. 2021) and low trust in the government, society, and science (Tranter and Booth 2015; Zhou 2015) are also more likely to be climate skeptics. It also corresponds to work by social movements scholars, who find that when an issue’s framing (e.g., climate science as elite machinations) particularly resonates with a target group’s cultural and ideological narratives, the group is more likely to mobilize (e.g., strongly endorse anti-climate sentiments) (Benford and Snow 2000; Berbrier 1998). At the same time, because liberal world society fosters hyper-empowerment, these individuals may feel particularly justified in their anti-climate positions. On the other hand, we expect liberal and moderate individuals to be more amenable to global liberal frameworks. For liberals, liberal world society reinforces already existing beliefs about how things “ought” to be. For moderates, because they lack a compulsive anti-liberal bias, they are also less likely to feel threatened by rejections of climate skepticism, and, as research shows, are most receptive to adjusting their beliefs following a factual correction (Wood and Porter 2019). We therefore expect moderates, like liberals, to exhibit lower climate skepticism as liberal embeddedness increases.

Thus, we hypothesize that embeddedness reinforces and further polarizes preexisting worldviews split along ideological lines. Specifically, we anticipate:

H3a: World society embeddedness is not linked to climate skepticism among right-wing individuals.

H3b: Greater world society embeddedness is linked to lower climate skepticism among non-right-wing individuals (i.e., liberals and moderates).

H3c: As world society embeddedness increases, the average difference in climate skepticism between right- and non-right-wing individuals will increase.

Figure 3 depicts our hypothesized process of attitude formation.

Data and methods

To analyze our hypotheses, we draw upon the International Social Survey Program (ISSP) Environment survey module, which provide measures on individual environmental and climate skepticism across nations in 2000, 2010, and 2020 (ISSP 2003, 2019, 2022).⁴ We analyze 65,333 individuals from 37 countries and 67 country-years (see Appendix A). Unlike other international surveys measuring environmental beliefs, the ISSP specifically evaluates skepticism, not just pro-environmentalism. By using the ISSP, our study benefits from a larger and more diverse sample of nations

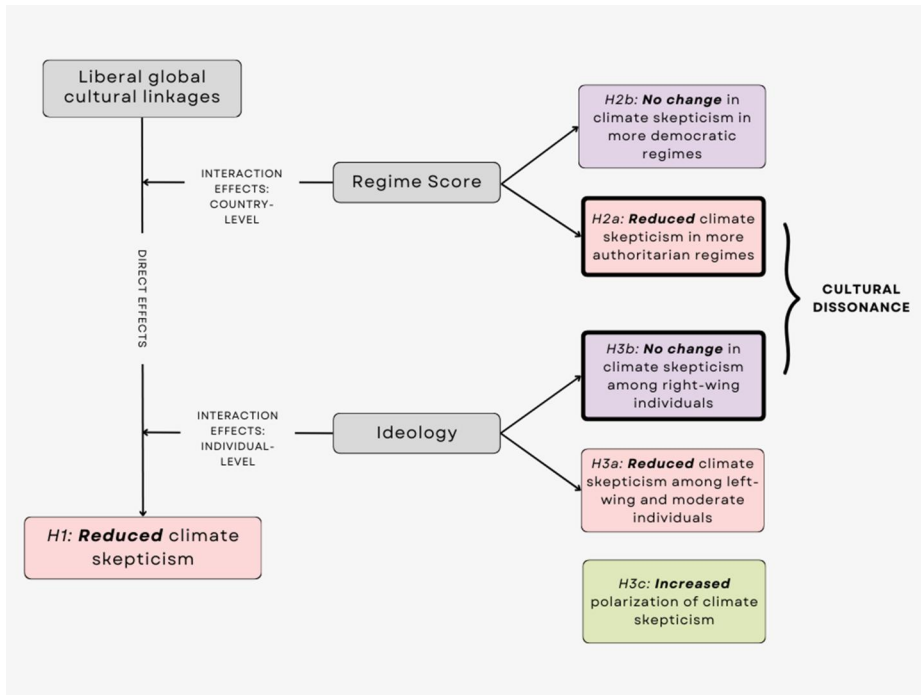


Figure 3. Proposed hypotheses.

and a longer time span than existing cross-national studies (Hadler 2016; Knight and Messer 2012; Lübke 2022; Zhou 2015). This extensive coverage aligns with the emergence of climate skepticism in both public and academic discussions (Gelbspan 1997; McCright and Dunlap 2000), thus making it ideal for our study.

Analytic approach

We use multilevel mixed-effects linear regression to analyze these data, enabling us to simultaneously evaluate national and individual-level predictors while accounting for clustering (non-independence) between observations (Snijders and Bosker 2012). Because clustering occurs across both nations and time, we estimate a three-level model whereby individuals (L1) are clustered within country-years (L2), clustered within nations (L3). Year dummies controlling for independent time effects and random intercepts at each level allow us to estimate the effects of liberal world society across time. Models with cross-level interactions include random slopes to account for cross-country differences (Heisig and Schaeffer 2019). Sampling weights account for selection probability and robust standard errors account for potential heteroskedasticity. Model VIFs indicate no problematic multicollinearity. Appendices C and D present the correlation matrix and descriptive statistics for all variables. All replication materials can be accessed at the following link: <https://osf.io/jakwq/>.

Dependent variable

To measure climate skepticism, we use one question from the ISSP asking respondents the extent to which they agree with the statement: “Many of the claims about environmental threats are exaggerated.” Responses range from 1 (strongly agree) to 5 (strongly disagree). For ease of interpretation and consistent with our theoretical motivations, original responses are reverse coded, with higher values of the dependent variable indicating greater skepticism. Although this measure is technically ordinal, we relax our assumption of equally spaced categories, given that regression results are highly insensitive to spacing issues (Pasta 2009).

This measure is ideal for several reasons. First, it provides unparalleled temporal and cross-national availability. No other question evaluating climate skepticism is asked repeatedly over time by the ISSP.⁵ Second, by emphasizing exaggeration, it uniquely captures a crucial component of climate skepticism: disbelief in purported scientific findings. Finally, it has strong conceptual validity. In addition to being used to operationalize climate skepticism in previous studies (de Graaf et al. 2023; Tranter and Booth 2015), this survey item has been empirically validated as a reliable measure of climate skepticism (de Graaf et al. 2023).⁶

Nevertheless, limitations remain. Despite the impressive breadth of the ISSP, the sample is Global North-centric and excludes several developing nations, particularly those in Africa. Our results are therefore not generalizable beyond the nations sampled and should not be used to make claims about climate skepticism in the world overall. Still, we provide here the most comprehensive assessment of cross-national climate skepticism currently possible with existing data, which should be interpreted with caution. Future studies can provide a more complete global picture by examining these processes specifically within Global South nations.

Independent variable

Our main variable of interest is embeddedness in global liberal culture, or liberal world society. In world society research, INGOs have long been regarded as the conventional carriers of the global liberal script. We argue that the singular focus on INGOs offers limited insight into the effects of global liberal culture on climate skepticism. Because liberal world culture acts as a multidimensional system of interlocking values and priorities, its dissemination cannot be boiled down to any single set of actors or institutions. Rather, liberal norms travel simultaneously across various societal axes and penetrate through different channels, such as universities, the exchange of students, global management standards, the media, and many other vectors (Schofer and Hironaka 2005). Thus, we suggest a more expanded understanding and operationalization of “embeddedness” than the current literature offers. When nations’ embeddedness in these institutions is high, citizens gain greater exposure and socialization to the liberal agenda and its various components, leading to its internalization.

We use a composite measure comprised of six indicators from a variety of sources, which together capture nations’ broader integration into liberal world society to construct our primary independent variable, **Global Liberal Embeddedness**. First, universities play a crucial role in shaping a liberal world society and cultivating its citizens—as

is evident in their teaching content, organization of knowledge, and broader functions (Frank and Meyer 2020). To capture the global liberal embeddedness of universities and thus, their contribution to the dissemination of global liberal templates such as pro-environmentalism, we utilize a university density indicator, calculated by dividing the sum of top universities recognized by QS World University Rankings in each country by its university-aged population. Second, because international organizations and treaty bodies provide the linkages through which liberal global norms diffuse (Boli and Thomas 1999), we include the following three indicators: the total number of INGO memberships, IGO memberships, and cumulative UN international human rights treaty⁷ ratifications. Additionally, as a supranational institution that monitors and enforces universal standards of professional behavior, the International Organization for Standardization (ISO) further establishes and disseminates liberal culture and its principles among individuals residing in participating nations (Peña 2011). We therefore include total yearly valid ISO-9001 certificates (quality management)⁸ as an indicator of state adherence to global standardization. Finally, because global intellectual and innovational engagement reflects two fundamental liberal cultural notions—an “individualistic view of creativity” and the prioritization of scientific advances—we include the number of international patents filed (Moschini 2004:474).

By combining these items into a single measure, we better capture the diffuse effects of world society—the effects of which is greater than the sum of its parts. We use factor analysis to construct this index for each year of observation. Our objective was to reduce the number of observed variables to a smaller set of unobserved factors that align with our theoretical framework. All variables positively contribute to the factor, and its corresponding Eigenvalue is above 1 for all years analyzed (2.23 for 2000; 2.17 for 2010; 2.44 for 2020). The factor loadings (see [Appendix E](#)) effectively distinguish this factor from other alternatives, and thus, no rotation was required. Based on these findings, we calculated three year-specific factors using maximum likelihood, which identifies the set of model parameters that maximize the probability of observing the data. This composite factor therefore provides a strong measure of global liberal embeddedness.

National-level controls

We include several country-level controls associated with climate skepticism. Following Givens and Jorgenson (2013), we use **Exports** of goods and services (percentage of GDP) to control for global economic integration. Considering the positive relationship between economic downturns and populist sentiments, including climate change denial (Lübke 2022), as well as the tendency for economic productivity to increase emissions and pollution (Jorgenson 2009), exports could increase or decrease climate skepticism. Next, like Zhou (2015), we use the Environmental Protection Index (EPI) from the Yale Center for Environmental Law and Policy to control for **Environmental Condition**. As a proxy for environmental risk, this measure accounts for the tendency for people in nations with greater environmental problems to exhibit higher environmental concern (Givens and Jorgenson 2011; McGranahan, Balk, and Anderson 2007).⁹ **GDP per capita** (logged for skewedness) additionally controls for

the tendency for people in wealthier, advanced industrialized nations to support post-materialist attitudes, such as environmental protection (Inglehart 1990; Mostafa 2013). Finally, we reverse-code Freedom House's **Regime Score** (ranging from 1 [full authoritarian] to 7 [full democracy]) (Coppedge et al. 2021) to assess the link between regime quality and climate skepticism.

Individual-level controls

Individually, we control for **Age** (in years), **Right-Wing** political affiliation (Right = 1, Else = 0), and **Religion** (None (ref) = 1, Catholic = 2, Jewish = 3, Muslim = 4, Protestant = 5, Buddhist = 6, Orthodox = 7, Other = 8) to account for climate skepticism among older, conservative, and religious—particularly Christian—populations. Although we considered religiosity, we decided against it because it reduces the sample size. Nevertheless, effects substantively hold. **Unemployed** (Unemployed = 1, Employed = 0) controls for climate skepticism among economically unstable individuals. **Education** and being **Female** (Male (ref) = 0, Female = 1) control for the tendency for men and less educated individuals to exhibit climate skepticism (Clements 2012). We considered including individual class (Xiao and Dunlap 2007), however this measure is only available in 2000 and is therefore excluded. We include **Age-Squared** for possible non-linearity.

Interactions

To account for cultural dissonance, we introduce two interaction terms, Global Liberal Embeddedness * Regime Score and Global Liberal Embeddedness * Right-Wing, which evaluate the effect of liberal world society across different ideological contexts at the country and individual levels, respectively. Together, these interactions test the capacity of liberal world society to withstand the contradictory effects of anti-liberal forces.

Results

Table 1 presents the additive (Model 1) and interaction (Models 2 and 3) effects of our main predictor and controls on beliefs. The first line represents the regression coefficient; the second, the standard error.

Main effects

In Model 1, we find a positive and significant effect ($p < .05$) of liberal world society. People in places that are highly embedded in global liberal culture are less likely to endorse climate skepticism, thus supporting H1. Owing to the abstract nature of the embeddedness factor, a numerical interpretation of the coefficient is not particularly insightful. We therefore graph the predicted margins for embeddedness in Figure 4 with all other variables held at their means to better contextualize these results. As depicted by the downward sloping line, as liberal embeddedness increases, individuals exhibit less skepticism (an average score of 2.87 out of 5 for people in the least embedded

Table 1. Longitudinal multilevel analysis of cross-national climate skepticism.

	Model 1	Model 2	Model 3
Global liberal embeddedness	−0.101* (0.045)	−0.371** (0.120)	−0.124** (0.044)
National-level controls			
Environmental condition	−0.003 (0.004)	−0.004 (0.004)	−0.003 (0.004)
Exports	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
GDP per capita (ln)	0.048 (0.090)	0.050 (0.087)	0.048 (0.089)
Regime score	−0.086*** (0.025)	−0.055 (0.033)	−0.082** (0.026)
Individual-level controls			
Right-wing	0.318*** (0.045)	0.318*** (0.045)	0.298*** (0.043)
Unemployed	0.020 (0.011)	0.020 (0.011)	0.019 (0.011)
Age	−0.005** (0.002)	−0.005** (0.002)	−0.005** (0.002)
Age-squared	0.001*** (0.001)	0.001*** (0.001)	0.001*** (0.001)
Female	−0.215*** (0.021)	−0.215*** (0.021)	−0.214*** (0.022)
Education	−0.176*** (0.020)	−0.176*** (0.020)	−0.176*** (0.020)
Religion (ref = none)			
Catholic	0.090** (0.031)	0.090** (0.031)	0.085** (0.031)
Jewish	−0.117 (0.126)	−0.117 (0.125)	−0.119 (0.123)
Muslim	0.132* (0.057)	0.132* (0.057)	0.138* (0.056)
Protestant	0.085* (0.033)	0.085* (0.033)	0.084* (0.033)
Buddhist	−0.079 (0.062)	−0.081 (0.062)	−0.075 (0.061)
Orthodox	0.061 (0.055)	0.062 (0.055)	0.062 (0.055)
Other	0.075 (0.040)	0.076 (0.040)	0.076 (0.040)
Interactions			
Global liberal embeddedness * regime score	−	0.043* (0.021)	−
Global liberal embeddedness * right-wing	−	−	0.089* (0.042)
Constant	3.305*** (0.811)	3.099*** (0.720)	3.278*** (0.792)
Year dummies	Yes	Yes	Yes
Observations	65,333	65,333	65,333
Countries	37	37	37
Country-years	67	67	67
Sd (country-year)	0.017	0.018	0.018
Sd (country)	0.033	0.029	0.032
Sd (residual)	1.198	1.198	1.190
Sd (right-wing)	−	−	0.041

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

nations vs. 2.54 for most embedded). A brief country-level comparison exemplifies these effects. In the Philippines—one of the least embedded nations in our sample—average climate skepticism is extremely high (exceeding 0.60 in 2010). Yet in the extremely embedded nation of Germany, average skepticism is rather low (less than 0.20 in 2020)

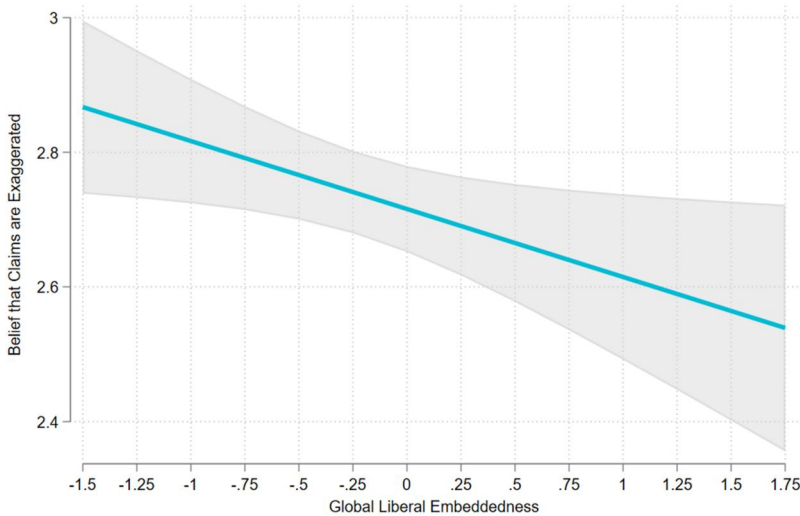


Figure 4. Predicted probabilities for global liberal embeddedness.

(see [Appendix F](#) for country-average scatterplot). Although this effect is relatively small, world society integration accounts for nearly 10 percent of within-country variation in the model (as seen from the reduction of country-year error terms).

Unsurprisingly, the coefficient for regime score yields similar positive results. Insignificant coefficients for environmental condition, exports, and GDP imply that when liberal cultural forces are accounted for, postmaterialist, global economic, and ecological risk arguments are insufficient for explaining climate skepticism. The insignificant effect of unemployment further supports this claim. Results for remaining demographics corroborate previous findings whereby people who are conservative, male, older, and Christian are more likely to be climate skeptics. Together, these results illustrate the capacity of world society to temper anti-liberal, populist climate skeptic positions.

Interaction effects

Building on Model 1, Models 2 and 3 explore the effects of cultural dissonance at the country (Model 2) and individual (Model 3) levels. Beginning with Model 2, the coefficient for Global Liberal Embeddedness * Regime Score is positive and significant, suggesting that the association between liberal world society and skepticism does vary by political context. [Figure 5](#) visualizes these results. Between the two thick lines representing the most extreme values [absolute authoritarianism (solid red) and full democracy (dashed blue)] lie a series of dotted lines representing intermediary regime scores.

As the graphic indicates, as regimes become less democratic, the negative slope of the line for predicted skepticism increasingly steepens. In other words, as regimes become *more* authoritarian and *less* democratic, the association between liberal global forces and reduced climate skepticism is enhanced. Thus, the link between liberal world society and skepticism *does depend* on regime score. More specifically, whereas the slopes of

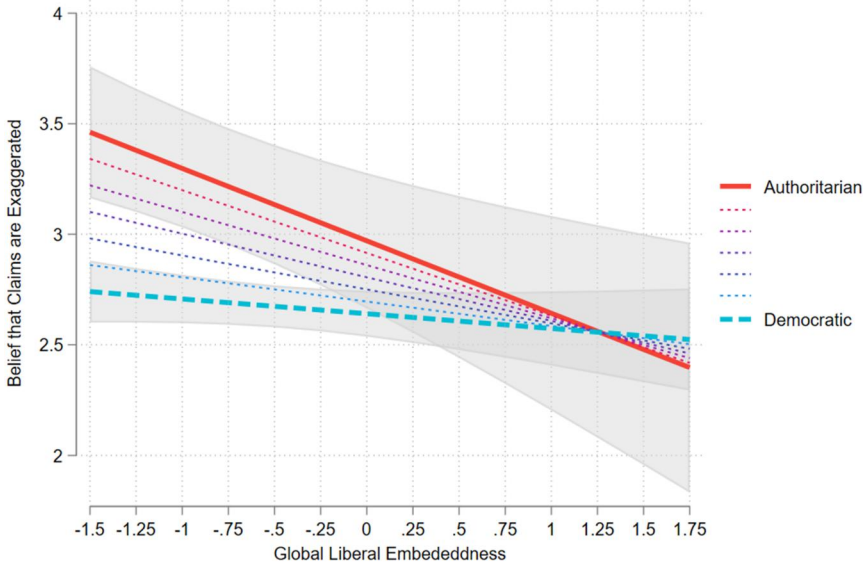


Figure 5. Predicted probabilities of climate skepticism by regime score.

Note: 95 percent confidence intervals plotted for fully authoritarian and democratic regimes.

the more authoritarian scores steeply decline, the slopes for more democratic scores are much more level, indicating support for both H2a and H2b.

For ease of comparison and interpretation, consider predicted skepticism at the extremes. In presenting these interpretations at the extremes, we aim to best illustrate the *full range* of cultural dissonance's possible effects. However, because actual regime scores are highly complex, multidimensional, and measured continuously, categorical interpretations only take us so far. Nevertheless, as the clear and significant steepening slopes indicate, increased world society linkages are associated with reduced climate skepticism amidst relatively high cultural dissonance at the national level, but are insignificant in places where liberal norms are already strongly institutionalized by national governments.

In fully authoritarian regimes, as embeddedness increases, average skepticism significantly decreases ($p < .05$) from 3.46 to 2.40 (a 1.06-unit change), thus supporting H2a. In contrast, in full democracies, skepticism only shrinks from 2.74 to 2.52 as embeddedness increases, a much smaller difference (.22 units), which fails to reach significance ($p < .05$), as indicated by the plotted confidence intervals and in support of H2b. These results also play out in our sample. Consider, for instance, two non-democracies plotted in [Appendix F](#) in 2010: Russia and the Philippines. Compared to Russia, which is much more liberally embedded (0.58 vs. -1.41), the Philippines exhibits much higher average skepticism (0.29 vs. 0.62). On the other hand, consider now Japan and Germany and 2020, which possess identical regime scores (6.5). Despite Germany being radically more embedded than Japan (1.77 vs. -0.74), average skepticism in these country-years is only marginally different (0.16 vs. 0.12). Together, these comparisons exemplify the liberalizing potential of world society within more authoritarian regimes, as well as its relatively negligible effect within already democratic settings.

It is also worth noting that differences between fully democratic and authoritarian regimes are insignificant where embeddedness is above the observed international average in our data (0 or more; $p < .05$), as the overlapping confidence intervals indicate. When global liberal forces are sufficiently strong, regime score matters rather little. However, when global liberal influences are absent, greater democracy becomes crucial for buffering skepticism. For instance, when embeddedness is lowest, the predicted level of skepticism in authoritarian regimes is 3.46 compared to 2.74 in democracies—a .72-unit difference. When embeddedness is highest, this difference becomes negligible, with an average skepticism of 2.40 in authoritarian regimes vs. 2.52 in full democracies (a .12-unit difference). Thus, when liberal world society linkages are pervasive, national-level cultural forces—whether liberal or illiberal—are irrelevant; the power of liberal global culture prevails even *regardless* of cultural dissonance. Yet without world society's overarching liberal context, political context is paramount.

Model 3 tests the interplay between Global Liberal Embeddedness and individual political leaning. The positive and significant ($p < .05$) interaction between Right-wing ideology and Global Liberal Embeddedness indicates that living in more liberally embedded countries renders individual ideology more consequential for climate skepticism, thus supporting H3a.

However, predicted effects suggest this relationship plays out differently than for regime score. Figure 6 visualizes these effects, plotting the association between embeddedness and skepticism among right-wing (solid line) vs. left-wing and moderate¹⁰ (dashed line) respondents. Compared to the slope of the solid line, which is relatively flat, the slope of the dashed line is steeper and negative. Consider the solid line for right-wing individuals, which inclines from 2.86 to 2.89 across the range of values for embeddedness—a paltry and statistically insignificant change ($p < .05$). Thus, world society is not associated with skepticism among right-wing individuals, lending support for

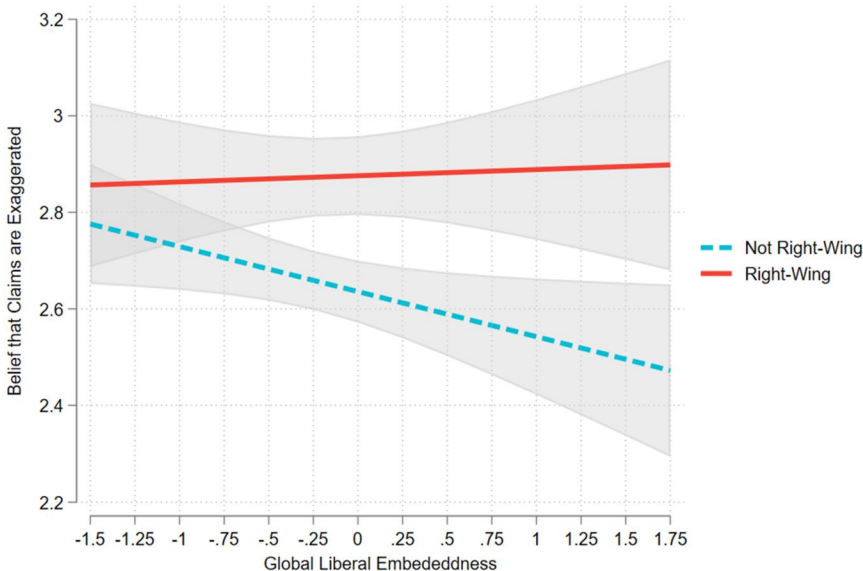


Figure 6. Predicted probabilities of climate skepticism by ideology.
 Note: 95 percent confidence intervals plotted

H3a. On the other hand, the trend for the dashed line for non-right-wing individuals significantly decreases ($p < .05$) from 2.78 to 2.47; greater embeddedness is associated with decreased skepticism among non-right-wing respondents, in support of H3b.

These claims are further reinforced by differences *between* right-wing and non-right-wing respondents, which become significant once embeddedness exceeds -1 . Although on average, right-wing respondents are more likely to be skeptical than non-right-wing respondents, when liberal world society is relatively absent, differences by political affiliation are insignificant. Yet as embeddedness increases, consensus disappears as beliefs polarize. For instance, when embeddedness equals -1.5 , the difference between right-wing and non-right-wing respondents' average climate skepticism is 0.081. Yet when embeddedness is highest, the magnitude of this difference nearly triples to 0.426. Tests of second difference confirm that this increased polarization (a net increase of 0.345) is significant ($p < .001$), in line with H3c.

In sum, when the liberal pressures of world society become tangible enough to generate cultural dissonance, polarization occurs, and differences emerge. Unlike non-right-wing respondents who are more amenable to global liberal narratives, individuals who firmly identify with right-wing ideologies are impenetrable to their pressure.

Robustness checks

We perform a series of robustness checks to ensure the validity of our findings. First, although we exploit most available ISSP data, missingness on ideology (i.e., right-wing)¹¹ and employment status¹² may bias our findings. However, coefficients for our main predictors generated using multiple imputation on these missing values, allowing us to use the full sample (38 countries; 72 country-years; 96,480 individuals), are consistent with the main models, suggesting no systematic bias (see [Appendix G](#)). Unemployment does become positive and significant at $p < .05$ in imputed models, supporting the notion that global economic downturns, manifesting through individual unemployment outcomes, may be relevant for understanding the rise of populist attitudes. We also substitute V-Dem's polyarchy for freedom house in all models. Results remain consistent with Table 1, indicating robustness to regime data (see [Appendix H](#)).¹³

Next, we test several additional predictors to ensure proper model specification and verify that our findings are not driven by omitted variable bias.¹⁴ At the country level, neither foreign direct investment (FDI) nor trade as a percent of GDP (Prakash and Hart 2000) reach significance when substituted for exports, indicating robustness to different indicators of global economic integration. Analyses including additional predictors of climate skepticism, including national unemployment (Lübke 2022), political polarization (Dunlap, McCright, and Yarosh 2016; Smith and Mayer 2019), and right-wing heads of state (Lockwood 2018) also substantively hold, and none of these predictors reach significance.

Individually, we consider trust in government and others, which are unfortunately only available for a reduced sample (in 2010 and 2020, for 36 countries and 46 country-years). Results substantively hold for all models, and corroborate existing work

identifying trust as a key component of populist attitudes, including climate skepticism (Zhou 2015). A control for environmentalism additionally ensures that the link between world society and reduced climate skepticism is not explained away by pro-environmental attitudes. Despite being positive and significant, this measure has no substantive impact on results, suggesting no issues of endogeneity. Finally, models substituting all country-level predictors with two-year lags substantively hold with all major predictors maintaining significance at $p < .05$, except one (Embeddedness * Regime Score, significant at $p < .109$), suggesting proper time-ordering.¹⁵

Discussion

Like many other topics, the environment and climate change have become an ideological battleground of global proportions. The sway of the liberal global order, though still influential, has begun to wane as illiberal populist alternatives gain traction. Using data from 65,333 individuals across 37 countries and 67 country-years between 2000 and 2020, we find that although liberal forces, global in scope, remain crucial for attenuating climate skepticism, they are not impervious to countervailing anti-liberal forces. In general, as embeddedness within liberal world society increases, climate skepticism decreases. When cultural dissonance between liberal and anti-liberal forces occurs, however, world society tempers climate skepticism at the *national* level (i.e., within more authoritarian contexts), but not at the *individual* level (i.e., among right-wing respondents). The implications of these findings are several.

Liberal world society as a buffer against illiberalism

First, exposure to liberal cultural norms and those who promote them not only facilitate the spread of pro-environmentalist attitudes as previous research suggests; they also *attenuate* anti-environmental attitudes such as climate skepticism, even during a post-liberal turn. These findings provide important implications for world society theory, which has thus far focused on individuals' internalization of liberal norms (Kim 2020b; Pierotti 2013; Zhou 2013) rather than their resistance to illiberal alternatives. We initiate this conversation, beginning with climate skepticism.

Although climate skepticism can, in many ways, be seen as a rejection of broader environmental norms, it is not simply the inverse of environmentalism (Tranter and Booth 2015). Indeed, not all who lack strong concern for the environment fundamentally reject the veracity of climate change or the scientific findings upon which such claims rest. The ISSP data support this assertion: pro-environmentalism and climate skepticism are only weakly correlated ($r = -0.119$), though, this correlation is growing over time ($r = -0.083$ in 2000 vs. $r = 0.189$ in 2020). World society scholars must therefore continue to evaluate and theorize about the impact of liberal world society on support for illiberal norms as a distinct phenomenon.

Future research may wish, for instance, to further disentangle the mechanisms through which liberal world society shields individuals from subscribing to anti-liberal narratives, such as climate skepticism. How are norm entrepreneurs reframing conventional environmental and climate narratives to counteract new illiberal challenges?

INGOs operating in these spaces often rely on their own expertise and information dissemination to problematize and publicize norms (Keck and Sikkink 1999). Is this still the case in a “post-truth” era (Vernon 2017) where science, facts, and information no longer reign supreme? What strategies do INGOs and other liberal actors use to discredit or create resilience against misinformation?

Scholars interested in answering these questions may wish to build on our work by exploring *how* the world environmental regime and its numerous components (e.g., environmental INGOs, IGOs, environmental ministries, treaty bodies) combat climate skepticism while identifying which strategies are more (or less) successful. Although not possible in the current study due to the lack of membership in nascent illiberal organizations among ISSP sampled countries (Bromley et al. 2020),¹⁶ it would also be fruitful to compare the efficacy of liberal vs. illiberal global cultural forces on climate skepticism. This line of inquiry can also be easily extended to a variety of illiberal norms against which liberal actors stand.

Cultural dissonance: when liberal and illiberal forces clash

The second major implication of this study is the insight it sheds upon how and why liberal forces (fail to) prevail when placed under duress. Recent scholarship recognizes the mounting tensions between liberal and illiberal forces (Glasius et al. 2020; Schofer et al. 2022). We advance this important line of work by exploring the outcome of such tensions specifically where liberal world society is most contested and thus, most vulnerable. In doing so, we expand existing knowledge about the conditions under which liberal norms are more or less resilient. Although world society can overcome cultural dissonance at the national level, it is less capable of doing so individually. In addition to confirming the increased salience of illiberal forces, these findings provide novel and important insights about the strengths and limitations of liberal world society: they suggest that world society is better at counteracting macro- as opposed to micro-level illiberal currents. Although we cannot be certain why this is the case, we can begin to speculate.

At the national level, the cultural dissonance fostered by world society challenges the fundamental principles upon which predominantly authoritarian societies operate. When such values are brought into question by strong liberal influences, the illiberal foundation upon which climate skepticism relies begins to crumble, undermining the legitimacy of such narratives altogether. It seems, therefore, that when cultural dissonance constrains the menu of legitimate positions individuals can adopt without attracting scorn, climate skepticism becomes a less appealing and subsequently, less commonplace choice. Thus, liberal world society may be most effective at undermining illiberal currents when it focuses on transforming collective social norms, which, as Durkheim tells us, are highly coercive of the individual. It is so effective, in fact, that when liberal embeddedness is sufficiently high, predicted differences in attitudes by regime score disappear. This corroborates foundational findings within world society research documenting the capacity for global liberal pressures to prevail over domestic attributes (Frank et al. 2000; Ramirez et al. 1997). Practically speaking, those working to correct false narratives about climate change may therefore wish to focus their efforts within more authoritarian contexts, where returns are likely to be high.

At the individual level, however, the tensions emanating from cultural dissonance are *cognitive*, rather than *collective*. It is perhaps precisely this lack of overarching social pressure that enables climate skepticism to remain intact. As prior research shows, individuals are not easily persuaded away from their preexisting worldviews (Nyhan and Reifler 2010; Taber and Lodge 2006). Thus, when world society challenges deeply engrained *personal* beliefs about themselves and their identity in relation to how the world operates, rather than breaking down *collective* barriers, it is less likely to yield success. Consistent with our findings, existing studies suggest that individuals see their political identity as an intrinsic part of who they are (rather than simply what they think), with such identities exhibiting remarkable stability (Sears and Funk 1999), and in some cases, overriding in salience several immutable, seemingly more fundamental identifiers, including race, gender, and religious affiliation (Westwood et al. 2018). Psychological studies additionally find that individuals exhibit greater hostility toward new information when it undercuts their worldview (Nyhan and Reifler 2010; Taber and Lodge 2006). It is perhaps these deeply engrained narratives about the self and society which make right-wing respondents so impervious to liberal pressures.

Ironically, world society also appears to be less successful at the individual level precisely *because* of its success in promoting other liberal norms—namely, individualism. Consistent with other studies of illiberal backlash (Cole 2023, Cole et al. 2023; Lerch et al. 2017; Lerch et al. 2022), it appears that the diffusion of individual hyper-empowerment through liberal world society can unintentionally backfire, fostering individual mistrust toward the very liberal order which empowered them. This leads to a polarization of beliefs. When liberal embeddedness is highest, so too is polarization; ideological distinctions become more pronounced where empowerment and individualization are prioritized. Our findings support this notion and add to existing literature documenting rising polarization within world society (Hadler and Symons 2018; Velasco 2020). They additionally uncover the underlying tensions rife within the broader liberal script (Börzel and Zürn 2020) and suggest, like prior norm diffusion research (Acharya 2004), that individuals take no issue in “cherry-picking” which norms they like and disregarding the rest. Thus, perhaps in some ways, liberal world society sows the seeds of its own destruction.

Concluding remarks

This study shows how embeddedness in liberal world society can play *both* an “inhibiting” and “contributing” role in shaping individual climate skepticism. When liberal and illiberal forces clash, the level of cultural dissonance is linked to the direction of world society’s effects.

Still, despite its contributions, limitations remain. First, our study adopts an unsophisticated treatment of ideology. Like Cole (2023), we acknowledge how (uncaptured) ideological variation across nations (i.e., someone considered “leftist” in one nation may be seen as “moderate” in another) may oversimplify our claims. Thus, although our study begins this conversation, a more nuanced investigation into how different political parties and actors within different national settings engage with liberal and illiberal climate change narratives is warranted.

Along a similar vein, though illiberal, greater authoritarianism does not automatically indicate greater anti-environmentalism. Indeed, many see “authoritarian environmentalism” as a swifter, more desirable approach to combatting environmental issues and climate change than those used in democracies because it places power in the hands of a few elites who can make decisive (and possibly unpopular) choices with ease (Eaton and Kostka 2014). However, authoritarian environmentalism does not necessarily yield better climate outcomes or greater climate awareness (Eaton and Kostka 2014; Gilley 2012). Although authoritarianism may be linked to lower climate skepticism in some cases, authoritarian regimes also uphold the illiberal institutions and cultural frameworks that perpetuate anti-liberal narratives, including climate skepticism. For instance, illiberal nations are more likely to restrict funding to NGOs—the primary carriers of liberal values such as environmental and climate norms (Bromley et al. 2020). Preserving world society linkages such as these when they are under threat will therefore be crucial in the continued fight against climate skepticism and misinformation within illiberal spaces. We encourage others to explore climate skepticism within more authoritarian spaces in greater depth, as some scholars have begun to do (Sonnenfeld and Taylor (2018).

Finally, we recognize the limitations of examining only one survey item to evaluate climate skepticism, given the highly multidimensional and complex nature of climate skepticism. However, no comprehensive set of questions exploring climate skepticism and its many dimensions, internationally fielded, yet exist. Future studies can expand on our findings by analyzing new survey items as they become available, and by exploring the extent to which environmental and climate skepticism converge, among whom, and under what conditions.

In sum, this study illustrates the complex and sometimes contradictory role liberal world society plays in preventing climate change skepticism. As cultural dissonance becomes more common—as it is likely to do if the current uptick in illiberalism continues—scholars must continue to explore how cultural tensions between liberal and illiberal forces shape the diffusion of, and resistance to, anti-liberal norms across different issue areas, within other spaces, and at varying levels of analysis.

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Data availability statement

The data underlying this article are available in The Open Science Framework (OSF) and can be accessed at <https://osf.io/jakwq/>

Notes

1. The United States, under Donald Trump, withdrew from the agreement in 2020 but rejoined in 2021.
2. Illiberalism therefore interacts and overlaps with similar concepts (e.g., conservatism, populism, the far-right), but remains distinct.
3. Although different conceptualizations and typologies of democracy exist (e.g., electoral, liberal, participatory), this issue is beyond the scope of our paper. Thus, we focus here on *overall* democracy.
4. The survey's first iteration (1993) does not have this measure.
5. For instance, although one question measures respondents' perceived origins of climate change (not happening, due to natural processes, or due to human activity), it is only

available in 2020 and for a limited number of countries (13), making its inclusion in longitudinal, cross-national analysis impossible. Still, strong bivariate associations between this measure and our dependent variable reinforce our chosen item's validity as a proxy for climate skepticism; in 2020, respondents who agree that claims about the environment are exaggerated are also most likely to agree that the climate has "not been changing" or has "been changing mostly due to natural processes" (see [Appendix B](#) for full bivariate associations).

6. Thus, using the word "environment" rather than "climate change" does not compromise the measure's validity (de Graaf et al. 2023).
7. Of those 18 identified by the UN High Commissioner. Sample minimum and maximum on this variable is 3 and 16, respectively. See <https://indicators.ohchr.org>.
8. ISO-9001 delineates the requirements necessary to reach ISO standards and is one of the most widely used management tools today. Although we considered other standards, only ISO-9001 has sufficient data.
9. Although the World Risk Index offers a more direct measure of *climate-specific* risk, data are unavailable for 2000.
10. Combined for final presentation for ease of interpretation. Results are consistent whether left and moderates are pooled or not.
11. Missing for: Canada 2000, Chile 2000, Israel 2000, Israel 2010, Japan 2010.
12. Missing for: Japan 2010.
13. Formal hypotheses hold; however, differences between regimes is marginal.
14. Results available upon request.
15. Results available upon request.
16. Including: the Shanghai Cooperation Organization (SCO), the Commonwealth of Independent States (CIS), the Organization of Islamic Cooperation (OIC), and the Alianza Bolivariana para los Pueblos de Nuestra América (ALBA). Because only Russia and Turkey in our sample are members, incorporating such a measure is impossible.

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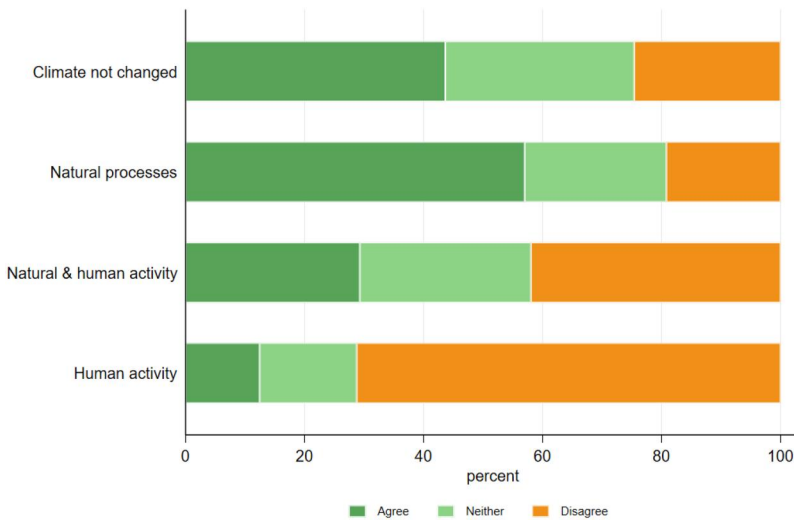
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Appendix A. Analyzed country-years

Argentina2010, Australia2010, Austria2000, Austria2010, Austria2020, Belgium2010, Bulgaria2000, Bulgaria2010, Canada2010, Chile2010, Croatia2010, Czech Republic2000, Czech Republic2010, Denmark2000, Denmark2010, Denmark2020, Finland2000, Finland2010, Finland2020, France2010, Germany2000, Germany2010, Germany2020, Hungary2020, Iceland2010, Iceland2020, Ireland2000, Japan2000, Japan2020, Latvia2010, Lithuania2010, Mexico2000, Mexico2010, Netherlands2000, Netherlands2010, New Zealand2000, New Zealand2010, New Zealand2020, Norway2000, Norway2010, Philippines2000, Philippines2010, Philippines2020, Portugal2000, Portugal2010, Russia2000, Russia2010, Russia2020, Slovakia2010, Slovenia2000, Slovenia2010, Slovenia2020, South Africa2010, South Korea2010, Spain2000, Spain2010, Sweden2000, Sweden2010, Switzerland2000, Switzerland2010, Switzerland2020, Thailand2020, Turkey2010, United Kingdom2000, United Kingdom2010, United States2000, United States2010

Appendix B. Bivariate correlations between dependent variable and alternate survey item, 2020 module



Appendix C. Correlation matrix, all independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	1																			
2	0.432	1																		
3	0.030	0.390	1																	
4	0.619	0.695	0.151	1																
5	0.365	0.580	0.200	0.663	1															
6	0.095	0.178	0.075	0.188	0.112	1														
7	-0.027	-0.079	-0.037	-0.074	-0.039	-0.032	1													
8	0.103	0.170	0.021	0.155	0.089	0.087	0.323	1												
9	0.099	0.164	0.018	0.149	0.086	0.086	0.388	0.984	1											
10	-0.03	-0.040	-0.011	-0.025	-0.029	-0.07	0.124	-0.007	-0.007	1										
11	0.044	0.162	0.071	0.157	0.038	0.056	-0.244	-0.166	-0.183	-0.028	1									
12	0.098	0.157	0.025	0.153	0.125	-0.025	-0.088	-0.08	-0.081	-0.076	0.110	1								
13	-0.09	-0.022	0.102	-0.157	0.07	-0.021	0.053	0.041	0.042	0.022	-0.139	-0.403	1							
14	0.019	-0.006	-0.016	0.014	0.008	0.002	-0.004	0.006	0.007	0.001	0.021	-0.023	-0.030	1						
15	-0.096	-0.221	-0.131	-0.134	-0.208	0.019	0.057	-0.089	-0.085	-0.004	-0.097	-0.103	-0.134	-0.008	1					
16	0.187	0.178	0.078	0.281	0.206	0.059	-0.019	0.040	0.037	0.015	0.070	-0.293	-0.381	-0.022	-0.097	1				
17	-0.117	-0.032	-0.082	0.01	-0.085	0.029	-0.009	0.038	0.037	0.010	-0.006	-0.085	-0.111	-0.006	-0.028	-0.081	1			
18	-0.17	-0.278	-0.06	-0.353	-0.545	-0.064	0.028	-0.003	-0.002	0.046	0.045	-0.143	-0.187	-0.011	-0.048	-0.136	-0.040	1		
19	-0.005	-0.065	-0.146	0.003	0.037	0.015	0.017	0.031	0.033	0.014	-0.011	-0.167	-0.218	-0.013	-0.056	-0.158	-0.046	-0.077	1	

Notes: Variables: (1) Global liberal embeddedness, (2) Environmental condition, (3) Exports (millions of current USD), (4) GDP per capita (logged), (5) Regime score, (6) Right-Wing, (7) Unemployed, (8) Age, (9) Age-squared, (10) Female, (11) Education (12) No Religion, (13) Catholic, (14) Jewish, (15) Muslim, (16) Protestant (17) Buddhist, (18) Orthodox, (19) Other religion.

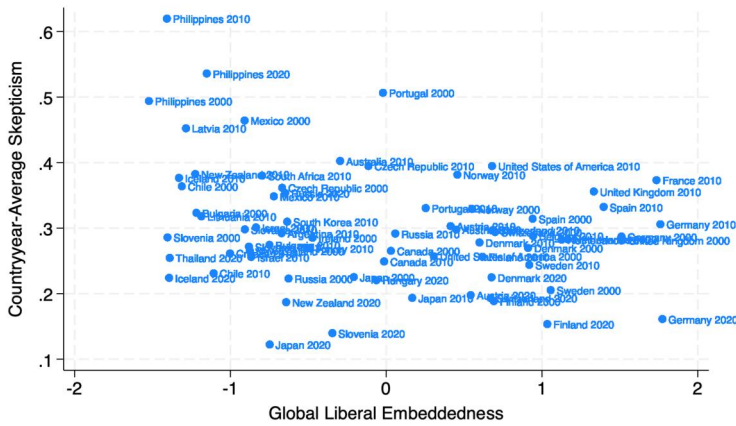
Appendix D. Descriptive statistics

Variable	Mean	Std. Dev.	Min.	Max.
<i>Country-level (N = 37)</i>				
Global liberal embeddedness	0.082	0.970	-1.523	1.773
Environmental condition	61.613	10.722	34.548	82.5
Exports (millions of current USD)	40.884	17.60	10.463	94.389
GDP per capita (logged)	10.002	0.972	6.978	11.382
Regime score	5.928	1.119	1	6.5
<i>Individual-level (N = 65,333)</i>				
Climate skepticism	2.728	1.153	1	5
Age	47.933	17.105	15	99
Age-squared	2590.178	1706.601	225	9801
Female	0.527	0.499	0	1
Education	2.153	0.707	1	3
Unemployed	0.434	0.496	0	1
Right-wing	0.257	0.437	0	1
<i>Religion</i>				
Catholic	0.344	0.475	0	1
Jewish	0.002	0.042	0	1
Muslim	0.033	0.179	0	1
Protestant	0.217	0.412	0	1
Buddhist	0.023	0.15	0	1
Orthodox	0.062	0.242	0	1
Other	0.083	0.276	0	1
<i>Interactions</i>				
Cultural embeddedness * Regime score	0.881	5.874	-9.061	11.526
Cultural embeddedness * Right-wing	0.061	0.470	-1.523	1.773

Appendix E. Factor loadings

	2020	2010	2000
Total # of top universities in the country divided by university age population	0.5619	0.4329	0.5933
Total # of IGOs to which country belongs	0.8222	0.8739	0.8279
Total # of NGO to which country belongs	0.9437	0.9541	0.9446
Total # of Human Rights treaties country signed	0.5281	0.1745	0.1519
Total # of certificates of ISO quality management standards	0.4242	0.5066	0.5183
Total # of international patents	0.0440	0.1040	-0.1177

Appendix F. Scatterplot of Country-year-Average skepticism and global liberal embeddedness



Appendix G. Analysis using multiple imputation

	Model 1	Model 2	Model 3
Global liberal embeddedness	-0.095* (0.037)	-0.463** (0.156)	-0.094* (0.037)
National-level controls			
Environmental condition	-0.002* (0.003)	-0.003 (0.004)	-0.006 (0.004)
Exports	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
GDP per capita (ln)	0.033 (0.079)	0.038 (0.074)	-0.005 (0.078)
Regime score	-0.003 (0.021)	-0.033 (0.031)	-0.061*** (0.018)
Individual-level controls			
Right-wing	0.306*** (0.033)	0.310*** (0.034)	0.263*** (0.025)
Unemployed	0.051** (0.012)	0.033** (0.011)	0.033** (0.011)
Age	-0.003*** (0.001)	-0.003* (0.002)	-0.003* (0.002)
Age-squared	0.001*** (0.001)	0.001*** (0.001)	0.001*** (0.001)
Female	-0.194*** (0.020)	-0.191*** (0.020)	-0.189*** (0.019)
Education	-0.180*** (0.020)	-0.178*** (0.020)	-0.180*** (0.019)

(continued)

Continued.

	Model 1	Model 2	Model 3
Religion (ref = none)			
Catholic	0.085*** (0.028)	0.086** (0.028)	0.082** (0.003)
Jewish	-0.138 (0.074)	-0.141* (0.073)	-0.144* (0.042)
Muslim	-0.129*** (0.041)	0.130*** (0.040)	0.135*** (0.002)
Protestant	0.068* (0.028)	0.067* (0.029)	0.058* (0.034)
Buddhist	-0.063 (0.037)	-0.067 (0.038)	-0.057 (0.113)
Orthodox	0.046 (0.048)	0.047 (0.048)	0.045 (0.338)
Other	0.083** (0.032)	0.084** (0.032)	0.078* (0.013)
Interactions			
Global liberal embeddedness * regime score	-	0.059* (0.027)	-
Global liberal embeddedness * right-wing	-	-	0.067** (0.027)
Constant	3.310*** (0.749)	3.149*** (0.625)	3.703 (0.001)
Year dummies	Yes	Yes	Yes
Observations	96,480	96,480	96,480
Countries	38	38	38
Country-years	72	72	72
Sd (country-year)	0.149	0.136	0.129
Sd (country)	0.131	0.134	0.148
Sd (residual)	1.093	1.092	1.090
Sd (right-wing)	-	-	0.147

Notes: The first number represents the regression coefficient; the second is the standard error.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Appendix H. Alternate regime score measure, polyarchy (V-DEM)

	Model 1	Model 2
Global liberal embeddedness	-0.096* (0.042)	-0.547** (0.202)
Regime score	-0.526** (0.190)	-0.165 (0.278)
Global liberal embeddedness * regime score	-	0.530* (0.246)
Observations	65,333	65,333
Countries	37	37
Country-years	67	67

Note: The first number represents the regression coefficient; the second is the standard error. Results represent fully specified models. Tables reduced for simplicity. Results for unrepresented. Models and covariates substantively hold.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.