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Border Orientation in a Globalizing World

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Abstract: *Border politics are a salient component of high international politics. States are increasingly building infrastructure to "secure" their borders. We introduce the concept of border orientation to describe the extent to which the state is committed to the spatial display of capacities to control the terms of penetration of its national borders. Border orientation provides a lens through which to analyze resistance to globalization, growing populism, and the consequences of intensified border politics. We measure border orientation using novel, geospatial data on the built environment along the world's borders and theorize that real and perceived pressures of globalization have resulted in more controlling forms of border governance. Empirical evidence supports this claim: States build more along their borders when faced with economic, cultural, and security-based anxieties. Border orientation enhances the study of border politics, complementing the politics of territorial division with a richer politics of liminal securitization and its consequences.*

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Borders are an increasingly salient component of national and international politics. States have historically fought bloody battles to establish their authority over space; for this reason, territorial conflicts are commonly cited as one of the most important causes of war (Senese and Vasquez 2008). Recently, however, states' authoritative peacetime border displays have become increasingly controversial. Globalization of markets and intensified human mobility increasingly challenge political authority and raise questions of cultural identity. Possibly in response to intensifying global pressures, some states employ highly visible strategies of territorial legitimation (Brown 2010) by asserting their control over physical space. In some cases, border control has become a central policy lever in response to a range of perceived external state and nonstate threats.

Scholars have few organizing conceptual frameworks to systematize the study of territorial authority in the modern era. The most advanced research program centers on *territorial claims*, where states compete over border location (Allee and Huth 2006; Schultz 2015). The continued pursuit of this research agenda is vital to our understanding of territorial politics but leaves aside many salient issues that persist even when a border is settled. We propose a paradigm-shifting focus to the question of *governance* along international borders (Longo 2017b; Simmons 2019). Making this shift requires an organizing conceptual framework for ascribing meaning to expressions of state authority at the border. We therefore introduce a new concept we label *border orientation*, which taps the state's commitment to the public, authoritative, and spatial display of its capacities to control the terms of penetration of its national borders, often in response to

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perceived vulnerabilities to external "threats" from state and non-state forces.

Though a state's border orientation cannot be observed directly, it can be approximately inferred by major physical investments at the border. These investments reflect how states attempt to filter and project their authority along the edges of their sovereign territorial jurisdictions, signaling their commitment to rule spatially.[1] The built environment represents a concrete effort—functional and symbolic—to control the terms of entry into, and potentially exit from, a national jurisdiction. These features constitute perimeter and access systems that can be analyzed as expressions of state authority. International borders, like other political spaces, are governed using infrastructure, which routinizes how information and commands are transmitted by the state. The built environment is therefore an especially important cue for understanding a state's border orientation.

Border orientation is important to the study of politics because borders are fundamental institutions of governance. Indeed, borders are "meta-rules," in the sense that they define the space over which other rules and policies apply. Internationally, they constitute the units of the state system. Domestically, a state's border presence attempts to assure citizens of the state's ability to supply security, to make and enforce rules, and to deliver or deny services. These aspects of spatial governance speak to the very legitimacy of the territorial state itself.

Border orientation can be documented empirically on a global scale. Using new data on border crossings, border barriers, and border-zone law enforcement stations, we construct and validate a hierarchical latent variable model that generates estimates of border orientation along a unidimensional scale corresponding to *permissive* border orientations, where little infrastructure is built, to *controlling* orientations where the presence of filtering infrastructure is intense. Using this concept of border orientation, scholars of comparative and international politics will be able to assess an important spatial aspect of governance.

Our empirical analyses confirm conventional wisdom and suggest new insights. Recent decades have witnessed heightened commitments to border security. Most intriguingly, our findings suggest cultural, economic, and security fears are robustly associated with more controlling orientations. We also find strong links between controlling orientations and the recent surge in populism experienced by many countries. Border orientation is a useful lens through which to explore a range of national anxieties, aspirations, and capacities and to interrogate spatialized governance in the context of globalization.

International Borders and State Authority

Borders and Legitimate Governance

The establishment of international borders has always been a foundational aspect of modern state legitimacy (Herz 1957). It is difficult to conceive of the territorial state without theorizing its borders as technologies to help legitimate its right to govern space. Territorial delineation, nation-statehood, and the formation of the modern state system were largely co-constitutive processes (Atzili and Kadercan 2017; Sahlins 1989). Indeed, territorial boundedness has become part of the definition of what it means to be a nation-state. Territorial integrity now constitutes a core norm of international relations (Zacher 2001).

For modern states, the international border is the ultimate symbol of sovereignty (Baud and Van Schendel 1997, 226). It defines the space over which states claim the monopoly of the legitimate use of physical force (Weber 1919) and in which they legitimately make, administer, and execute law (Baudet 2012, 32). Moral claims to territory, at least in liberal theory, rest on the legitimate right to govern (Buchanan and Moore 2003, 6). In his sweeping historical account of borders, Maier (2016, 78) writes that "sovereignty, ownership, and morality came with the territory literally and figuratively."

Unsurprisingly, then, threats to border control are understood by some state officials and domestic groups as threats to the state itself. Similarly, national borders are likely to be viewed by dominant but vulnerable domestic groups as a way to secure their local culture and protect a cherished way of life. A "borderless world" (Ohmae 1990) worries nationalists of many stripes. Economic integration and technological innovation have contributed to the sense that state boundaries are of vanishing relevance. Transnational threats—from insurgencies to terrorism to cyber threats—are said to have "de-bordered" national security in new ways (Goodman and Portnoy 2009). National security threat assessments in the 1990s for the first time began to place transnational organized crime near the top of the list.[2] The metaphor of a

[1]Here, we are concerned with conceptually defining and measuring border orientation; we leave to future research the question of whether these spatial investments are effective or efficient (Allen, Dobbin, and Morten 2018).

[2]In 1995, Presidential Decision Directive-42 (PDD-42), created by President Bill Clinton, recognized global organized crime as a threat to national security. Available at https://fas.org/irp/offdocs/pdd/pdd-42.pdf.

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networked world displaced that of a territorialized and politically bordered one (Castells 2000)—a shift that has not universally been experienced as positive. Indeed, in some countries these developments are viewed as a conspiracy of elites corruptly dodging investments at home.

Human mobility in particular is increasingly interpreted as a source of threat to ontological security, or a stable sense of national, group, or individual identity (Mitzen 2006). People living in countries other than that of their birth constitute between 3% and 3.25% of the world's population.[3] About 25.4 million people were forced to flee their countries and live abroad as refugees in 2017; another 3.1 million presented themselves at foreign borders as official asylum seekers.[4] Borderlands have (re)emerged as the epicenter of national identity politics (Wilson and Donnan 1998).

We do not contend that these trends "cause" human insecurity. We make the lesser assumption that they are plausibly experienced as such by *some* groups in *some* states.[5] Moreover, threats blur and merge, such that it is unproductive to distinguish traditional issue categories: In the popular imagination, terrorism merges with migration, security with deindustrializing trade competition, and rebel threats with foreign interventions. Since states' legitimacy is based on their territorial claim to rule, they have good reasons to meet a wide range of external governance challenges with *visible* border policies. This is understandable since international borders are among the most globally recognized and revered institutions of any in human social relations (Diener 2012). There is no clearer response to the global governance challenges to the modern nation-state than to invest in visible symbols, structures, and practices that signal state control at the border. Such investments are deeply bound up with the project of legitimating the state itself, even in parts of the world where effective control is illusive (Chalfin 2010). One implication of this theory of the territorial state is that symbolic as well as functional strategies will increase alongside processes of globalization (Brown 2010; Rudolph 2005). Yet, political science lacks a conceptual and analytic framework for understanding, let alone measuring, these challenges to territorial governance.

[3]United Nations (UN), http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf.

[4]United Nations High Commissioner for Refugees (UNHCR), http://www.unhcr.org/en-us/statistics/unhcrstats/5b27be547/unhcr-global-trends-2017.html.

[5]A rich literature has developed over the past two decades exploring how territorial states battle transnational forces they cannot easily control. That literature describes new forms of bordering (Sassen 2008), "invisible" borders (Goff 2000), "exported" borders, and "rebordering" (Andreas and Biersteker 2014; Herzog 2014; Rumford 2006).

The Concept of Border Orientation

Our purpose is to introduce such a framework and to demonstrate that it can be meaningfully conceptualized and measured. We suggest the notion of *border orientation*, defined as the extent to which the state is committed to the public, authoritative, and spatial display of control over territorial entry and exit at its national borders. A state's border orientation can range from relatively permissive to controlling. Permissiveness is characterized by a willingness to allow the movement of goods and people to proceed across borders unchecked. Controlling orientations, by contrast, seek to project filtering capacity, even while simultaneously facilitating desired transnational trade or human movement. Such a state will want to publicly and visibly display its ability to permit entry of goods and people on its own terms.

Border orientation encodes the methods, practices, and styles of establishing state authority in territorial space. Our use of the word *orientation* is analogous to a firm's unobservable *entrepreneurial orientation* which comprises such observable indicators as its research and development expenditures, debt, and competitive aggressiveness (Lumpkin and Dess 1996). *Goal orientation* is used in personality and achievement studies, where it is understood as a "disposition toward developing or validating one's ability in achievement settings" (VandeWalle 1997, 995) as gleaned from subjects' responses to validated personality instruments. An even closer analogy from political science is Caughey and Warshaw's (2016) "overall orientation of state policy," which makes use of 43 indicators of "policy liberalism" to characterize the *ideological orientation* of the 50 United States. The concept of orientation is used in many contexts to denote the positioning of someone or something in relationship to their surroundings, and it may encapsulate essential features of both individuals (Fromm 2013) and organizations (Hurley and Hult 1998).

Organizational orientations raise the issue of where these underlying characteristics come from and at what level of analysis they are generated. Just as the literature on entrepreneurial orientation does not attribute it to the individual CEO (Lumpkin and Dess 1996), border orientation typically is not the product of a single leader. It arises from the interplay of societal preferences and domestic institutions that aggregate and propagate actionable values more generally. In liberal polities, border orientation is the product of civil society preferences

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as refracted through representative institutions. In autocratic states, border orientation can emerge from the preferences of a smaller ruling elite and can actively repress civil society, as the Berlin Wall exemplified. We refer to a state's border orientation as shorthand for the result of this state-society interplay in the context of specific domestic decision-making institutions.

Border orientation is a compound concept that combines the intensity of authoritative display and the location where it is exercised. Theories of spatial governance emphasize the location of infrastructure as a strategic choice, with consequences for internal consolidation and development (Boone 2003; Steinberg 2017). Border governance requires a similar treatment in the face of external pressures from globalization. Infrastructures of border control may be justified as protection from unwanted foreign influence, culture, ideologies, violence, disease, or other "dangers." State control may also be positively justified as essential to public goods provision, from the rule of law to comprehensive public welfare. Importantly, "controlling" orientations typically do not seek to block all cross-border flows. Rather, they signal an anxious domestic audience as well as an audacious international one that the state will determine who and what enters, and on what terms—in other words, the authority to *filter*.

The *spatial* character of this authority is central to our concept. We are interested in describing a phenomenon that potentially reinforces, and possibly even reifies, the political boundary of the state. The international border is arguably one of the most legitimate locations for such display. Filtering unwanted foreign goods and people can certainly be exercised internally, but it is often criticized as an encroachment on civil liberties. It can also take place extraterritorially—in foreign airports, at sea, or even on the sovereign territory of other states—but at the cost of accusations of imperialism and coercion (Longo 2017a). International law and norms support the common conception that every state has the right to "defend its borders" *at* the border. To do so is nearly synonymous with making existential legitimacy claims.

The concept of border orientation also includes an aspect of "logistical power"—a form of power that derives from shaping and controlling the physical world (Mukerji 2010). The ability to filter the mobility of people and goods "is premised on infrastructural strength that operates through increasingly territorializing means" (Martin 2012, 355). We conceptualize physical border structures as a means to display and exercise political authority.

We define border orientation along a single dimension based on filtering of entry into and exit from the national territory, whether aimed at the entry of armies, products, migrants, or violence. Moreover, border orientation is typically sticky over time. Whereas political rhetoric or policy fluctuations may change in response to emergencies or sudden shifts in political pressure, a commitment to state presence at the border often requires the development, deployment, and maintenance of significant resources and is typically observed over years, rather than days. Investments often accumulate with time, but they also deteriorate and are sometimes purposefully dismantled, as were many of the border controls in what is now the Schengen Area.

Border orientation can be conceptualized at multiple levels, the highest of which reflects a state's national orientation toward its set of neighbors. Some states seek to project more control over borders with particular neighbors. For example, the United States arguably goes to greater lengths to display control along its southern border than it does in the north. In coordination with other Schengen countries, Poland displays much more state authority along its eastern border with Belarus and Ukraine than the border with Germany to the west. Border orientation may also vary locally along a single border. Some states that are highly committed to projecting border authority generally may have exceptional crossings where state presence is low (e.g., Big Bend National Park where Texas borders Mexico).[6] Some borders, such as northern Chile and southern Peru, have well-appointed border crossings (e.g., that at Tacna and Arica) but no off-road fencing at all, rendering ambulatory evasion simple.[7] The higher a state's overall orientation, however, the rarer such variance will be. Just as the ideology of a political official can be thought of as the proportion of "left" or "right" votes they cast—that is, a congressional DW-NOMINATE score (Poole and Rosenthal 2000)—border orientation can be thought of as the proportion of a state's border or borders where it seeks to project its presence. In short, while border orientation can be conceptualized as a general characteristic of a state, it also has a dyadic, even local component.

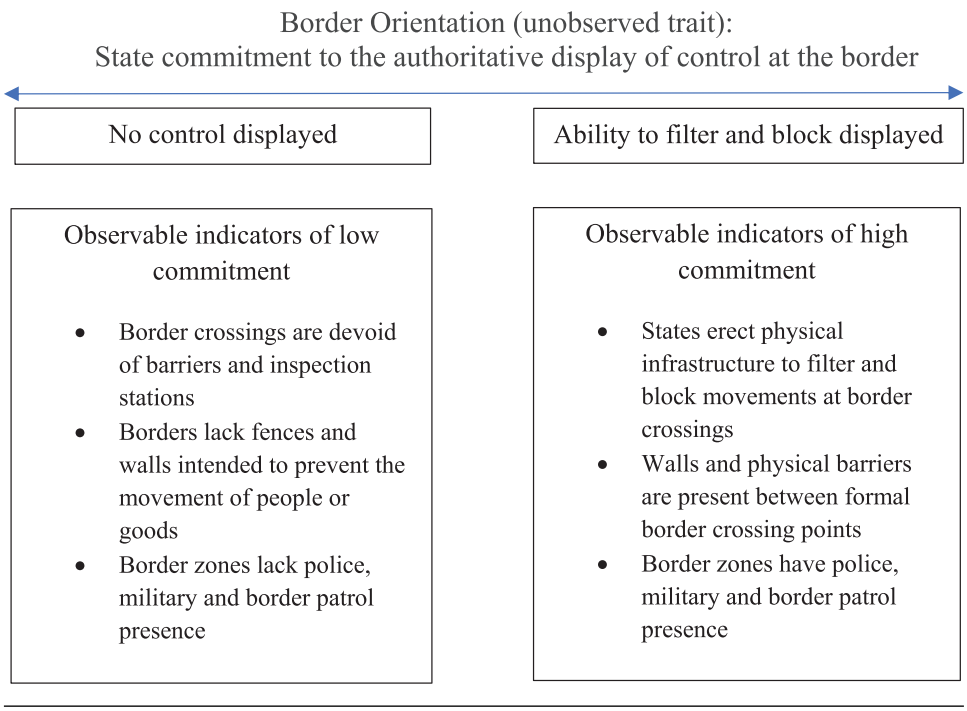
Authoritative display is not inherently utilitarian. It often has a symbolic element. Flying a national flag over a port of entry is an obvious example. Border walls and fences too are often symbolic rather than strictly functional (Brown 2010). For whom is the display intended? It may be directed primarily to foreign audiences, signaling welcome, efficiency, or a determination to deter. Or the display may primarily be intended to signal protection or competence to a domestic audience. Such displays often have a Janus-faced quality, communicating to

[6] Site visit, June 2017.

[7] Site visit, July 2019.

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FIGURE 1 Border Orientation and its Manifestations



internal and external audiences simultaneously. Importantly, we focus on displays but are agnostic about their effectiveness.

Strictly speaking, border orientation is not a measure of whether a border is open or closed to transnational traffic. A controlling border orientation is fully consistent with a liberal trade regime for licit goods (e.g., NAFTA liberalizes trade while the United States tightly controls its southern border.) Nor do we consider covert filtering technologies such as invisible sensors or landmines to constitute public display. States sometimes outsource border management to nonstate actors, from private security firms to the volunteer sector to international organizations, but here our focus is on *public* bordering expressions by the state's central government and/or its official agents.

A state's border orientation is latent—it cannot be observed directly. The best proxies are fundamental authoritative investments at and near the border, which are crucial visual indicators of a state's commitment to border control. We recognize the built environment is not a perfect indication of orientation. Resource constraints may lead to underestimation since it is possible states might invest more to assert their authority on their borders if they could afford it. Similarly, there may be less need to display authority on mountainous borders that few will observe or attempt to penetrate. Nonetheless, fundamental authoritative investments are a useful indicator of a state's orientation toward controlling territorial entry and possibly exit.

Figure 1 presents border orientation along a unidimensional spectrum. At one end, states demonstrate little control over their borders—perhaps only delimiting and demarcating them. In the extreme, it is hard to determine the existence of an international border on the ground at all. We describe this orientation as "permissive" in the sense that few attempts are made to visibly display control or filter movement at the border. The opposite is true at the other extreme, where orientation is highly controlling. These states make great investments to demonstrate control over their borders, which are often marked with walls, fences, and other physical structures. The claim is not that such efforts represent a closed border or exist to stifle movement; rather, this end of the spectrum displays the authority to enforce border filtering.

Data: Collecting Information on the Built Environment at the Borders

To explore border orientation, we have created an innovative data set of observable physical investments at the border. These are of three kinds: architecture at each land port of entry; infrastructure built along each side of a territorial land border, including every wall or substantial

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TABLE 1 Features of the Built Environment

Border Crossing Features	Description
(1) Official building(s)	Codes whether and how many buildings are near the border that appear to be "official," meaning a state-controlled border security facility
(2) Gate or barricade	Gates, barriers, or structures that straddle the main road that itself crosses the international border. Includes partial structures that appear designed to slow, divert, inspect, identify, or stop traffic
(3) Split lanes	Identifies any change in the roadway to accommodate search, interdiction, inspection, or pullover areas
Border Zone Features	**Description**
(1) Border wall/fence	Man-made structures erected across interstate borders with the intention of denying entry of unwanted materials or personnel, recorded at the directed interstate dyad level (Carter and Post 2017)
(2) Relative police station density	Location of police stations were obtained from OpenStreetMap. Police density is calculated as the proportion of police stations in the region around land borders relative to the interior, both weighted by population

Note: Detailed information on coding procedures is available in SI Appendix D (pp. 12–15).

fence built parallel and proximate to the border; and the relative density of police stations in the land border zone (Table 1).

Access Points: Border Crossings

Border crossings are the spaces where states may implement a mix of policies, structures, and symbols that connect and separate, facilitating exit and entry *selectively*. To identify border crossings, we used American Geosciences Institute data to identify major highways connecting pairs of contiguous countries.[8] We overlaid this highway database on a political map of the world to isolate intersections (border crossings) before validating them visually.[9] These crossings generally reflect places where motorized vehicles can cross the border, usually with at least one paved lane each way. If a road approaches but does not cross the border, it is deleted as a false positive. For each border crossing, visual inspections using both high altitude and street view images were made to characterize the built environment on each side per Table 1, distinguishing State A and State B.

While Appendix D in the supporting information (SI; pp. 12–15) gives the criteria in detail, Figure 2 depicts two extreme examples. The United States has invested tremendously in symbols and capacity to filter activities at many of its border crossings with Mexico. Inspection stations, barriers, and buildings are all arrayed to improve the chances of filtering in this space. Parts of Africa provide a stark contrast, as shown by a remote border crossing between Burkina Faso and Togo. Importantly, we do not assert that we can tell exactly the nature of the threat states intend to disrupt through these efforts. However, we do infer an intent to signal the authority and capacity to control a border configured as shown in Figure 2a.

Based on these criteria, we produced a data set of 828 total border crossings with 20 yearly observations. The visual corpus from which Figure 2 is drawn is massive but limited in important ways. High altitude images are generated in response to demand, so some parts of the world have clearer and more numerous images than others. Existence of a crossing requires that a highway be included in the underlying roads data set, which is primarily based on roads as of 1997.[10] Images of the built

[8]United States National Imagery and Mapping Agency. Documentation and definitions are available at http://www.agiweb.org/pubs/globalgis/metadata_qr/roads_qk_ref.html.

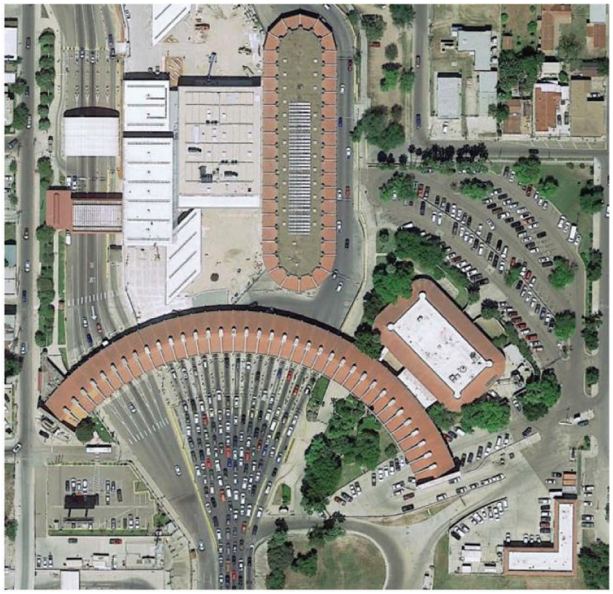
[9]Using latitude/longitude coordinates generated by the overlay exercise, human coders used Google Maps, Bing, and Yandex to locate and code each crossing. We eliminated instances where all assigned coders failed to confirm a crossing.

[10]These are an adequate sample since we are not primarily interested in the building of roads, but rather the authoritative filtering structures on those roads.

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FIGURE 2 Examples of Controlling and Permissive Border Crossing Structures

a United States and Mexico



b Burkina Faso and Togo



Note: Each panel is an example of imagery used to code border crossing structures. The geographic coordinates are 27.502377, –99.502641 for image a and 10.977377, 0.511543 for image b.
Source: Google Earth

environment were coded from 2000 to 2019, with image quality and coverage improving over time. Because of uneven coverage of imagery data (observations are available irregularly, and typically not yearly), we forward- and backward-interpolate the data, assuming that border crossing structures present in the first observed year existed prior to that date and continued to exist until subsequent observation periods.

Perimeters: Walls and Fences

States have recently started to erect walls at an accelerated rate (Carter and Poast 2017; Hassner and Wittenberg 2015; Vallet 2016). The stated justification for building walls is varied, but it often reflects a desire to directly block unwanted movement across a significant portion of the border region, be it the movement of armed forces, migrants, criminal organization, or illicit materials. The presence of walls is typically justified as an attempt to deny illicit forms of entry or exit in the border region, instead funneling movement toward legal ports of entry where active filtering can take place.

We use Carter and Poast's (2017, 248–50) data to identify continuous border structures intended to "prevent entrance by any unwanted entities" (248). Like the original authors, we refer to all structures in this data set as "walls," though it also records structures that are better defined as fences and defense lines. In 2014, the most recent year for which these data are available, there were 45 recorded walls, but recent research suggests this number has increased since then. Given right-censoring, we assume any walls present at that time continue to exist.

Border Zones: Police Stations

Finally, we consider the possibility that police have a role in displays of border control. Although they are structured differently across countries—some are centrally controlled at the state level while others are localized; some are civil while others are closely connected to the national military—policing institutions are a "special source of the state's monopolization of legitimate force on its territory" (Reiner 2010, 6). Andreas (2003) has argued persuasively that border security more than ever resembles policing. As such, the location of policing investments is highly relevant to border displays.

Border areas have long been associated with smuggling, trafficking, and contraband of unwanted goods and people (Dube, Dube, and Garcia-Ponce 2013; Munro 2012). Especially since 9/11, ordinary police have become increasingly involved with the enforcement of state immigration laws, even in states where such responsibilities have traditionally been outside of their job description (Wishnie 2004). Police have become central to the institutionalization of cooperative "integrative border management" practiced in Europe and elsewhere (Bigo 2014). To the extent that the border is viewed as a place where authoritative social control is necessary, police presence at and near the border becomes a priority.

In contrast to border walls and border crossings, investments in policing are made throughout national ter-

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ritory, with population centers a likely priority. We therefore measure police presence in the border region relative to the interior of a state, weighted by population in each area, using geocoded data on police stations worldwide derived from OpenStreetMap (OSM), gathered in July 2020.[11]

These data result from voluntary crowdsourcing, but they nevertheless give a general indication of where police are located. Importantly, these police data are time invariant, and we are therefore unable to determine when each police station was built. These data are useful in unpacking cross-sectional variance in police presence, but they do not contribute to temporal variation in the measurement model introduced below.

To generate a measure of relative police presence, we begin by drawing a 30 km buffer zone on each side of all international land borders and record the number of police stations per 100,000 population within this area. We then compare the density of police stations per population within the interior of a country, excluding coastal zones. Relative police presence is calculated as

$$\textit{Relative Police Presence} = \frac{\textit{border police stations}}{\textit{border population}} \Big/ \frac{\textit{interior police stations}}{\textit{interior population}}$$

where higher values correspond to disproportionate police presence in border zones relative to the interior of a country, controlling for population. In the following section, this measure is divided into a five-category index to adjust for its highly skewed distribution.

Measurement and Validation of Border Orientation

Latent Model of Border Orientation

Border crossing infrastructure, border walls, and borderland police presence are all manifestations of a state's underlying border orientation. Latent variable models provide a principled means for generating estimates of an unobservable concept based on its observable manifestations (Fariss, Kenwick, and Reuning 2020). We construct a Bayesian latent variable model to estimate border orientation at particular border crossings, as well as for contiguous directed dyads (i.e., each side of an international border) based on these features. The model assigns higher values to border dyads and crossings that contain more infrastructure, according to the indicators outlined above, and lower values when little infrastructure is present.

Because the indicators are measured across differing levels of analysis, we use a hierarchical modeling structure. In the equations below, we index each border crossing $i = i \ldots, N$ and each directed dyad $d = d \ldots, D$.[12] The manifest variables, or "items" outlined in Table 1, are indexed $j = j \ldots, J$ and are observed for either a border crossing i or directed dyad d such that y_{idj} is the observed value of indicator j at border crossing i along a directed border dyad, d.[13] Finally, the specific integer values an indicator can take on are denoted $k = 1 \ldots, K$, such that $K = 2$ for dichotomous indicators and $K > 2$ for indicators with more than two categories.

Our model generates two estimates of border orientation (the latent trait). The first, θ_{id}, is an estimate of border orientation at a particular border crossing i along directed dyad d, and the second, ξ_d, is a state's overall dyadic orientation toward a particular neighbor. Each of the manifest variables is linked to the latent trait through two conditioning parameters: a "discrimination" parameter β_j and a "difficulty" parameter α_j. These are analogous to a slope and intercept or cut point parameters in a conventional regression setting.

The manifest indicators and latent trait are linked through an item response theory modeling structure, which is composed of a series of ordered logistic regression functions. These reduce to the two probability equations below, where $\alpha_{j0} = -\infty$ and $\alpha_{jK} = \infty$ and $F()$ is the cumulative logistic function. Equations (1) and (2) pertain to the probability equations for crossing-level and directed dyad–level indicators, respectively, as reflected in the absence of the i subscript in the latter.

$$P\left[y_{idj} = k\right] = F\left(\alpha_{jk} - \beta_j\theta_{id}\right) - F\left(\alpha_{jk-1} - \beta_j\theta_{id}\right) \quad (1)$$

$$P\left[\, y_{dj} = \, k\right] = F\left(\alpha_{jk} - \beta_j\xi_d\right) - \, F\left(\alpha_{jk-1} - \beta_j\xi_d\right) \quad (2)$$

The likelihood function for our model can be expressed as

$$\mathcal{L} = \prod_{i=1}^{N}\prod_{d=1}^{D}\prod_{j=1}^{J}\left[F\left(\alpha_{jy_{[idj]}} - \beta_j\theta_{id}\right) - F\left(\alpha_{jy_{[idj]}-1} - \beta_j\theta_{id}\right)\right]^{v_j} * \left[F\left(\alpha_{jy_{[dj]}} - \beta_j\xi_d\right) - F\left(\alpha_{jy_{[dj]}-1} - \beta_j\xi_d\right)\right]^{(v_j-1)} \quad (3)$$

where v_j is a dichotomous indicator that is equal to 1 if indicator j is observed at the border crossing level and 0

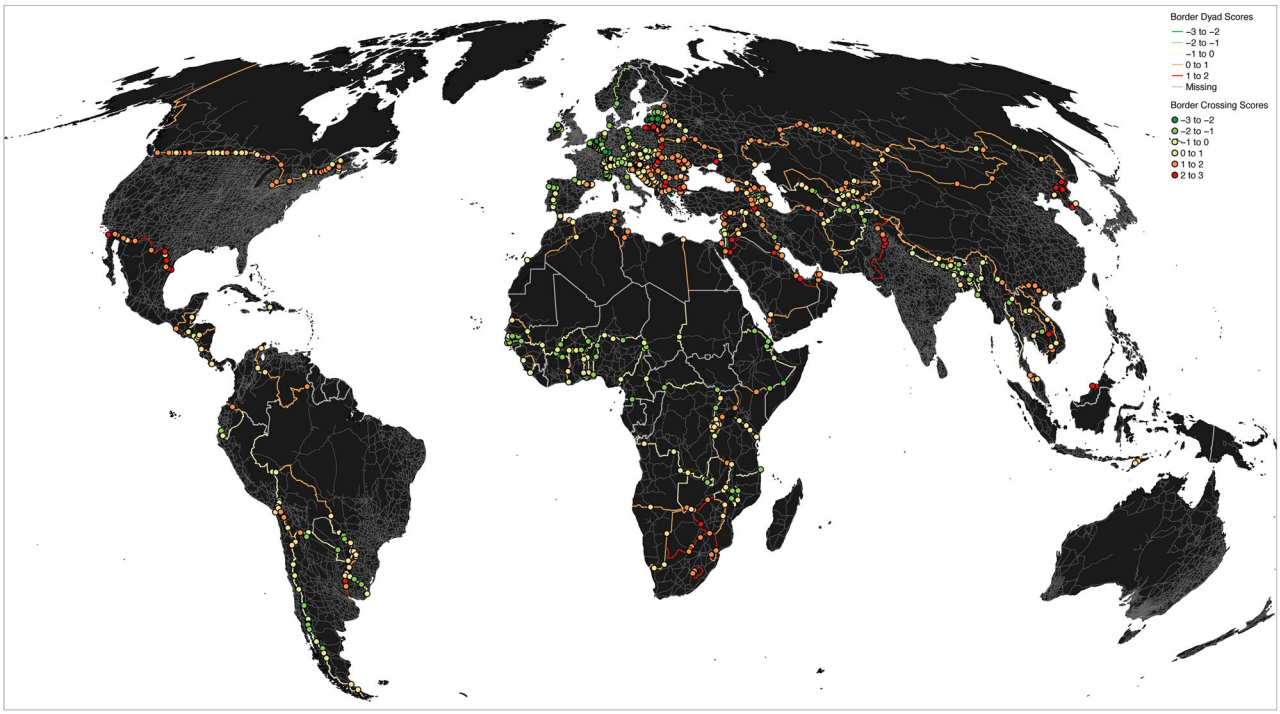
[11] See https://wiki.openstreetmap.org/wiki/Map_Features#Amenity.

[12] Dyads with no border crossings are omitted from our data.

[13] With the exception of the police data, which are time invariant, all of our indicators are observed annually, $t = t \ldots, T$, though we omit this indexing.

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FIGURE 3 Border Orientation at the Level of the Border Crossing and Border Pair



Note: Border crossings are displayed as points and border dyads are displayed as lines, scored after being residualized on a regression of GDP per capita and average elevation. Results are averaged across each side of the border. Green corresponds to permissive orientations and red to controlling orientations. Borders without major road crossings are displayed in white and not assigned an orientation score

if it is recorded at the directed dyad level, as is the case for the border wall and police data.

All latent variable models must impose constraints to resolve problems of location, scale, and rotational invariance. The latent trait itself has no natural scale, and multiple sets of parameter values could fit the observed data equally well. We follow common convention in assigning Bayesian priors to provide the model with sufficient identifying information about the distribution of the latent trait.[14] We begin by assigning the following hierarchical prior distributions to the latent trait:

$$\theta_{id} \sim Normal\,(\xi_d,\ \sigma)$$
$$\xi_d \sim Normal\,(0,\ 1)$$
$$\sigma \sim Half\,Cauchy\,(0,\ 2.5)$$

The standard normal prior on ξ_d imposes the assumption that the latent trait is approximately normally distributed, with a mean intentionally centered at zero. This resolves the problem of location and scale invariance by indicating an arbitrary point at which the latent trait will be centered, as well as the overall scale of the distribution. The prior assignments for the item-specific parameters are as follows:

$$\alpha_j \sim Normal\,(0,\ 10)$$
$$\beta_j \sim Half\,Normal\,(0,\ 3)$$

The assignment of a strictly positive distribution to the discrimination parameters, β, resolves rotational invariance and reflects the assumption that the presence of physical infrastructure (as proxied through our variables) corresponds to higher (rather than lower) values of the latent trait.[15] We estimate the models using RStan, a Bayesian modeling program.[16] Sufficient samples were obtained after running five parallel chains for 3,000, with the first 1,500 from each discarded as warm-up. Trace plots and $\hat{R}$ statistics were consistent with convergence.

Mapping Border Orientation Globally

Figure 3 displays a global map of the 2018 border orientation estimates, netting out two potential confounders:

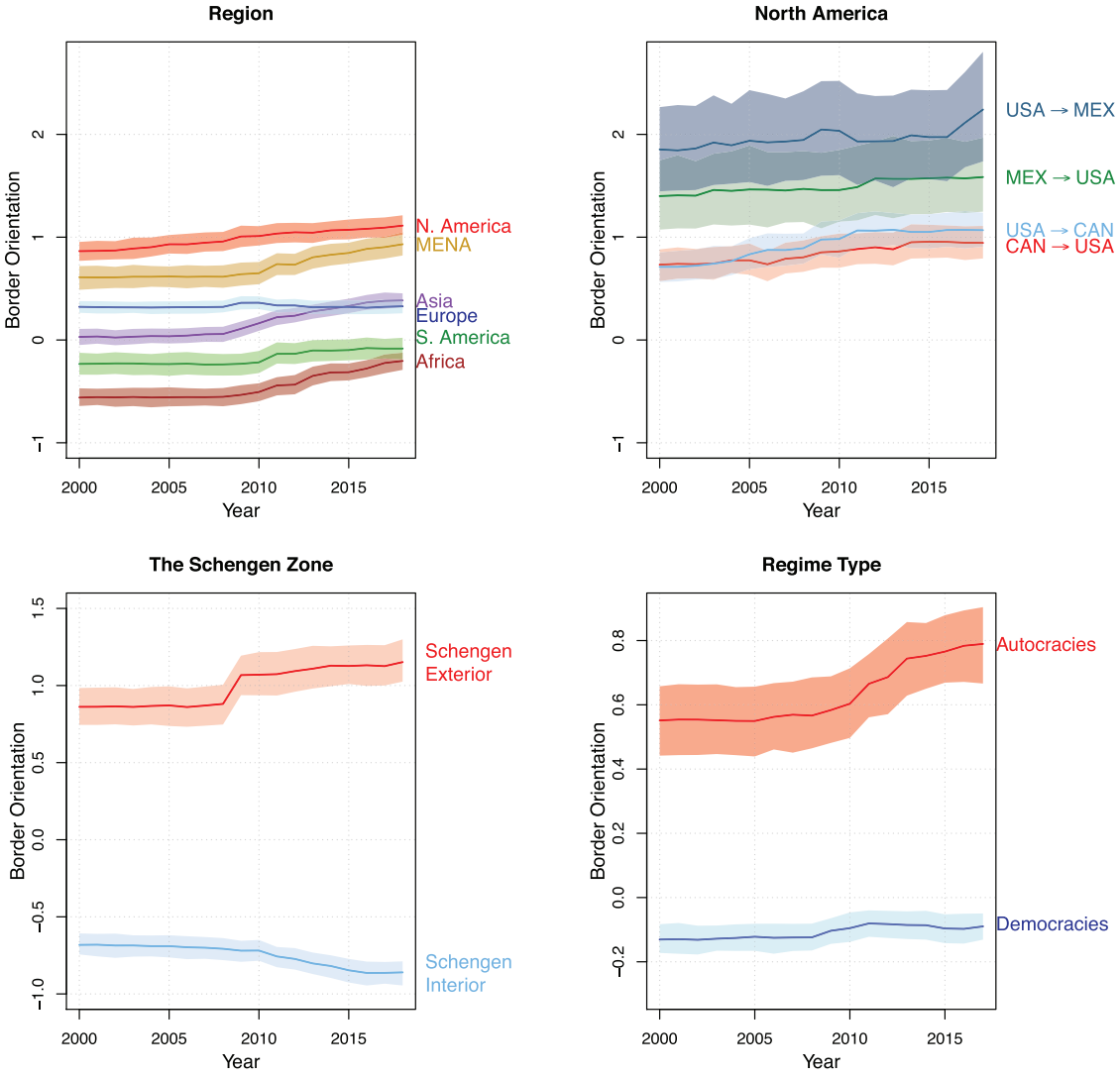
[14]See Fariss, Kenwick, and Reuning (2020, 359–61) for a more complete discussion of identification.

[15]All pairwise correlations among the manifest indicators are positive, suggesting that this assumption is not restrictive.

[16]Stan Development Team (2018).

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FIGURE 4 Border Orientation across Time



Note: Mean border orientation score by regime type, region, Schengen Area status, and North American borders. Shaded regions denote 95% credible intervals

wealth, which affects the capacity for displays of control, and geography, which affects the need for displays of control. To do this, we simply regress our border orientation scores on logged GDP per capita and average elevation at border crossings and display the resulting residuals.[17] Figure 3 therefore displays border orientation after adjusting for the influence of geography and capacity. Border crossings are displayed as dots and color-coded according to the latent trait estimates (θ) averaged across both sides of the border. Average scores of the border dyad latent trait (ξ) are displayed as lines. Permissive (low) border orientation scores are displayed in green and controlling (high) scores are displayed in red.

The map confirms many intuitions. Within the Schengen area, green borders and crossings signal states' commitments to free internal movement. Evidence of filtering mounts on Schengen's eastern edge. Border crossings in sub-Saharan Africa are permissive, which cannot be attributed to a lack of resources alone since the residuals have already stripped wealth from the estimates in this map. South Africa, however, is notably more controlling. Authoritative display wanes along borders that are remote, such as those along the Andes, even after adjusting for altitude.

Figure 4 displays border orientation over time. Borders in most regions of the world have experienced sig-

[17]These factors explain only about 1% of the variation at the crossing level and 4% at the dyadic level, such that our original and residualized estimates correlate above .95 (see SI Appendix B, pp. 5–6).

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nificant increases in official state presence, confirming that globalization coexists with hardening borders. The rate of increase has accelerated in recent years, especially in Africa, Asia, and the Middle East. In North America, elaborate filtering infrastructure already existed at the outset of our temporal domain, though the imagery does reveal intensification between 2000 and 2018. After splitting our sample among autocracies and democracies in 2000, we find that autocracies are increasingly more controlling than democracies. The Schengen Area demonstrates that infrastructural cumulation is not inevitable: Infrastructure can be ripped away with a major commitment to doing so.

Validation

Several steps were taken to validate the measurement model.[18] First, we analyzed model fit through posterior predictive checks by comparing observed data with the parameter estimates generated by the model. In every case, the predicted and observed distributions closely accorded with one another, providing evidence of strong fit.[19]

Second, we assessed our measure's ability to distinguish from adjacent but distinct concepts (Adcock and Collier 2001).[20] One possibility is that border orientation is the same concept as international trade control/facilitation. To evaluate whether this is the case, we calculate each country's mean border orientation score and compare this to the World Bank's Trade Across Borders Index, which is a composite of the time and cost for documentary and border compliance to export and import goods.[21] These two indicators are only weakly related ($\rho = 0.158$), suggesting that control and efficient handling of trade are neither incompatible nor the same concept.

Is our model of border orientation simply capturing development? Logged GDP per capita is only modestly correlated ($\rho = 0.192$), as is national material capability ($\rho = 0.171$). Clearly, our measure captures something apart from these concepts. Moreover, there is not a convincing overlap between border orientation and actual immigration policies. Border orientation is only slightly stronger in states with few visa waivers[22] but does not vary much across dyads with visa waivers and those without. Certainly, border orientation is conceptually and operationally distinct from existing concepts and policies.

What Explains States' Border Orientation?

Border orientation is a paradigm-shifting concept that facilitates systematic investigation of a broad range of border anxieties in domestic and international politics. Territorial claims and conflicts are not the only source of border insecurity; indeed, this source of insecurity may in fact be on the decline as norms about territorial integrity have strengthened. To state the obvious, the southern U.S. border is among the most controlled in the world, but this can hardly be understood by territorial disputes or claims with Mexico. Border insecurities are often unrelated to traditional interstate territorial disputes. We hypothesize that border orientation is driven at least in part by perceived external threats to the social and economic life of "the nation." What is at stake may not be traditional territorial integrity (Zacher 2001), but rather economic and even ontological security: domestic groups' identity as productive, successful members of their cultural and national community.

In this section, we do not aspire to test a fully elaborated causal theory of border orientation, but we do illustrate its potential for understanding contemporary politics with a disciplined investigation of three overlapping threat vectors: *cultural* threats, *economic* threats, and traditional *security* threats. Table 2 presents an analysis of how each relates to border orientation, measured at the directed dyad-year.[23] To account for temporal nonindependence, we report results of Prais-Winsten regression models, which assume a first-order autoregressive pattern in errors. Models 4 and 5 are run on limited samples due to the inclusion of covariates with sparse coverage.

Border insecurities appear to go well beyond those investigated in existing international relations research. Cultural identities exert strong boundary-reinforcing

[18]This section reports results using our raw, unresidualized version of our measure to allow for closer comparisons to wealth and development indicators.

[19]Investigation of item-specific parameters also suggests the border crossing indicators are weighted most heavily in determining overall orientation scores.

[20]SI Appendix A (p. 3) contains bivariate correlation plots pertaining to each discriminant validity check in this section.

[21]See World Bank, "Doing Business: Trade Across Borders," available at http://www.doingbusiness.org/data/exploretopics/trading-across-borders.

[22]Data are from Mau et al. (2015).

[23]Additional regression analyses are reported in SI Appendix C (pp. 7–11).

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TABLE 2 Correlates of Border Orientation, Recorded at the Directed Dyad Year

	(1)	(2)	(3)	(4)	(5)
Cultural anxieties:					
Cultural homogeneity[a]	0.163*	0.168*	0.166*	0.209*	0.009
	(0.028)	(0.028)	(0.029)	(0.039)	(0.067)
Percent foreign-born population	0.002	0.002	0.002	0.003	−0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Change in percent foreign-born population	−0.001	−0.001	−0.001	−0.035*	0.000
	(0.001)	(0.001)	(0.001)	(0.016)	(0.004)
Same primary religion type, different secondary religion	0.025*	0.027*	0.027*	0.259*	0.024
	(0.012)	(0.012)	(0.012)	(0.051)	(0.017)
Different primary and secondary religion type	0.008	0.003	0.006	0.105*	0.075
	(0.026)	(0.026)	(0.027)	(0.051)	(0.052)
Economic anxieties:					
Five-year change in globalization		−0.001*	−0.001*	0.000	−0.001
		(0.000)	(0.000)	(0.001)	(0.001)
Difference in logged GDP per capita with neighbor		0.036*	0.040*	0.060*	0.156*
		(0.012)	(0.013)	(0.018)	(0.024)
Security anxieties:					
Count of MIDs with neighbor, 1980–99[a]			0.028*	0.009	0.004
			(0.007)	(0.009)	(0.011)
Count of civil conflicts in neighbor, 1980–99[a]			−0.003*	−0.003*	−0.004
			(0.001)	(0.002)	(0.003)
Logged number of terrorist events (10-year moving average)			0.000*	0.000	0.000*
			(0.000)	(0.000)	(0.000)
Territorial issue				−0.003	
				(0.013)	
Populism:					
Average populist rhetoric score[a]					0.383*
					(0.091)
Control variables:					
Logged GDP per capita	0.049*	0.035*	0.035*	0.011	−0.030
	(0.011)	(0.012)	(0.013)	(0.019)	(0.025)
Democracy (Polity2)	0.000	0.000	0.000	−0.002	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Average elevation[a]	−0.022	−0.021	−0.013	−0.012	−0.126*
	(0.021)	(0.021)	(0.021)	(0.026)	(0.028)
Schengen Area member	−0.052*	−0.052*	−0.056*	−0.025	−0.035*
	(0.013)	(0.013)	(0.014)	(0.022)	(0.016)
Neighbor's border orientation	0.265*	0.282*	0.293*	0.539*	0.364*
	(0.011)	(0.011)	(0.011)	(0.022)	(0.018)
Constant	−0.677*	−0.569*	−0.591*	−0.555*	0.286
	(0.084)	(0.089)	(0.093)	(0.136)	(0.245)
AR (1) coefficient	0.968	0.966	0.964	0.995	0.961
Durbin-Watson statistic (original)	0.063	0.067	0.071	0.007	0.080
Durbin-Watson statistic (transformed)	1.808	1.808	1.805	0.9421	1.954
Observations	7,596	7,458	6,997	818	2,576

Note: [a]Time-invariant indicator. The unit of analysis is the directed dyad year and estimates of border orientation are the dependent variables in all regressions. *$p < .05$.

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influences in almost all model specifications. Culturally homogeneous countries—those with fewer religious, language, and ethnic divisions (Alesina et al. 2003)—typically establish a more controlling orientation than those with more heterogeneous populations. This points to the possibility that cultural similarity is prized, signaling that cultural others may be filtered at the border. The models also track the proportion of a country's population that is foreign born,[24] and whether this proportion is increasing, although these factors are not statistically significant. However, in SI Appendix C (pp. 7–11), we show that increases in foreign-born populations exert an increasingly strong, positive association in more recent years.

Culturally influenced bordering is evidenced by neighbors' religious differentiation as well, although bordering is more intense within, rather than between, major religions. Two religious (dis)similarity measures are included using the Correlates of War religion data (Maoz and Henderson 2013). Both are related to the largest religious group on each side of a border. "Primary" religious affiliations include Christianity, Judaism, Islam, Buddhism, Hinduism, syncretic beliefs, and animism. The "secondary" level further subdivides Christianity (i.e., Protestant, Catholic, Orthodox, Anglican), Judaism (i.e., Orthodox, Conservative, Reform), and Islam (i.e., Shia, Sunni). Intriguingly, the secondary level matters most: Countries that share the same primary religion (e.g., Christianity) but have a different secondary religion (e.g., Catholicism vs. Protestantism) tend to erect more at their borders, whereas dyads with differences at both levels are no more or less likely to hold controlling orientations than religiously similar dyads.[25] In other words, it is not always "clashes" among the world's primary religions (Huntington 2000) that drive border orientation, but narrower differences within the major religions. Iran's borders provide a good example. Border violence including 8 years of war with its Sunni neighbor, Iraq, has led to strong fortification along these countries' shared frontier. By comparison, Iran's border with Eastern Orthodox Christian Armenia suggests little intent to filter. The border between Catholic Republic of Ireland and Protestant Northern Ireland (UK) is an open exception and is maintained as such with conscious effort.

[24]Data from the United Nations (2017) are recorded every 5 years, 1990–2015 and for 2017. We interpolate data between observation periods and calculate change accordingly.

[25]The reference category for all regressions includes countries whose largest religious group is the same at both the primary and secondary level, as well as a small number of observations (0.70%) where countries have the same secondary religion but a different primary religion.

Economic disparities likely also generate border anxieties. Wealth differentials consistently matter; the larger the wealth gap between a state and its neighbor, the higher our measure of border orientation. The mechanism could involve concerns about inflows of low-wage workers and low-cost goods from a neighboring state stoking domestic political pressures for border control. General statewide measures of economic, political, or social globalization[26] also exert a negative influence on border orientation. This link between globalization and opened borders may be precisely what has led to some notable instances of backlash, with nationalists in otherwise globalized states attempting to reassert sovereignty in the border region.

To be sure, border orientation has some traditional security explanations as well. First, border displays are indeed heavier along the borders of states that historically have had militarized conflicts, as measured by the number of militarized interstate disputes between neighboring states from 1946 to 1999 (Maoz et al. 2018; Palmer et al. 2015). The military ceremonies held by India and Pakistan at the Wagah-Attari crossing is emblematic of this interplay between interstate rivalry and border politics. Western Europe's experience demonstrates that the consequences of past conflict are neither inevitable nor irreversible. Second, terrorist attacks, defined as instances where nonstate actors threaten or use violence against civilians to intimidate or coerce for political, religious, or economic ends,[27] are correlated with more controlling border orientations.[28] By contrast, we found a negative relationship between past civil conflict in a neighboring state[29] and controlling border orientations. We suspect that this result is driven by capacity, as less developed states are likely to share borders with conflict-

[26]These are de facto measures based on economic, political, cultural, and interpersonal sub-indicators. For details, see Gygli et al. (2019). The economic indicator weights trade and financial integration most heavily. Data are available at https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html.

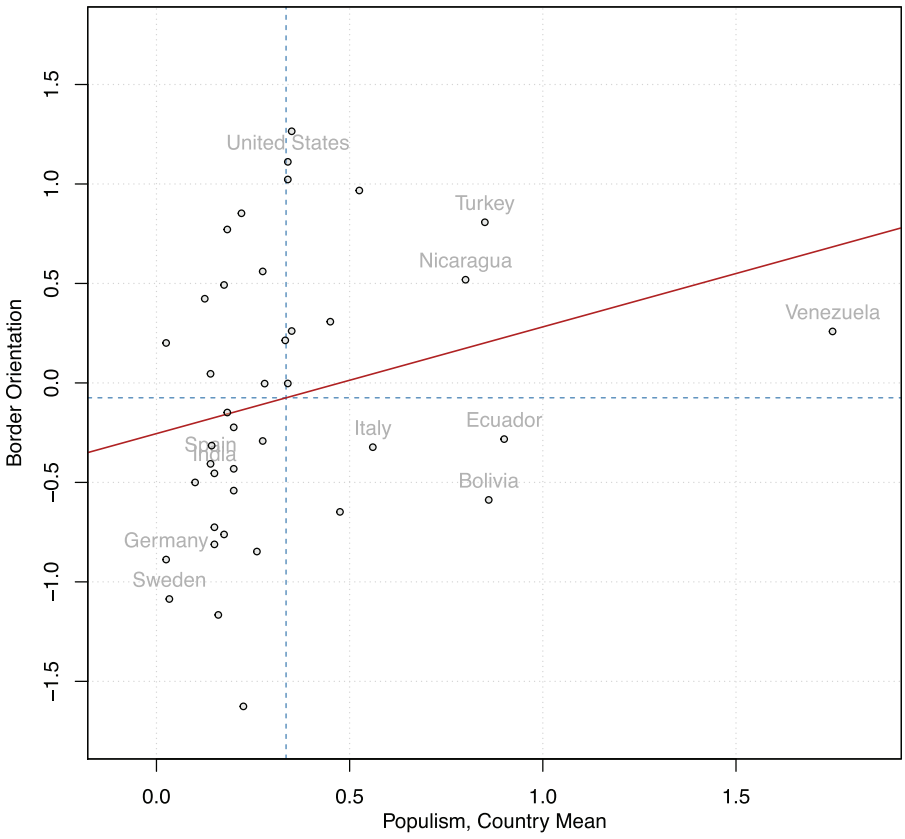
[27]This is measured as a count of terrorist attacks within a state's territory within the past 5 years (National Consortium for the Study of Terrorism and Responses to Terrorism [START] 2018, Global Terrorism Database [data file], https://www.start.umd.edu/gtd).

[28]Previous studies have found a similar, positive link between terrorism and the construction of border walls and fences (Avdan 2018). Once built, border walls may reduce the occurrence of terrorism (Avdan and Gelpi 2016). Since in many cases terrorists enter a country at official crossings rather than overland, our more granular measure may provide a more precise test of this link in future research.

[29]This is a dichotomous variable for whether the neighboring state is experiencing a civil conflict resulting in at least 25 fatalities in the preceding two decades (Allansson, Melander, and Themnér 2017).

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FIGURE 5 Populism and Border Orientation



Note: Note the bivariate regression line is in red. Border orientation is countrywide mean score for the period 2000–2018

prone neighbors yet lack the capacity to project their presence.

One important finding is a null result: There is little evidence that the traditional conception of borders as territorial divisions explains modern border orientation. There is no direct evidence that the presence of an unsettled or conflicting territorial claim between neighbors significantly impacts border orientation.[30] These data are limited to 3 years' worth of observations, which is why we include the variable only in Model 4, but the null finding suggests that the usual way of thinking about borders—as territorial divisions that are inherently disputatious and potentially threaten state security—is not in fact the central condition associated with investments in the symbols and structures of modern border security.

If modern border orientation cannot be fully explained by traditional state security concerns or staking out claims to territory under interstate dispute, we need an innovative explanation for the trends described with these new data. The cultural and economic findings above suggest broad political movements and ideologies of "othering" contribute to domestic demands for border control. As an additional plausibility probe, we explore the relationship between border orientation and one measure of populism. Although populism has many contextualized meanings, we test for a conception of populism that represents a "thin" ideology and that distinguishes two homogeneous and antagonistic groups: a "corrupt elite" and a "pure people" (Mudde 2017). It "presupposes that the elite comes from the same group as the people, but have willingly chosen to betray them, by putting the special interests and inauthentic morals of the elite over those of the people" (Mudde 2017, 30). "Pure people" is a term that is often racially and nationally exclusive. Rodrik (2018) relates the rise of populism to specific global economic shocks: Populists from the left are often concerned with combatting threats from trade and investment, whereas those on the right are often concerned with immigration and refugees. Human

[30]Data were obtained from Frederick, Hensel, and Macaulay (2017). Given the short temporal domain and high degree of autocorrelation, we also supplemented this model with cross-sectional variants, finding no substantive changes in the territorial issue indicator.

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mobility, cultural difference, and economic integration have arguably sharpened cleavages that make populist ideas increasingly salient. We hypothesize that both functional and symbolic border displays are increasingly attractive under these circumstances.

Model 5 includes the average level of populist rhetoric employed in speeches by presidents and prime ministers using the text-based measure computed by Hawkins et al. (2019). These data are currently available for only 40 countries, including most of the larger countries of Europe, some of the Americas, India, and Turkey. Border orientation is not a characteristic of a single political leader, but since the sample for which data are available is fairly democratic, this measure likely reflects broad political currents that have at least some appeal nationally. We take the average score across the entire observation period of 1998–2019 to gain a holistic picture of a given state. The populist rhetoric of leaders is indeed correlated with a state's border orientation in the expected direction. Figure 5 demonstrates a robust bivariate correlation between populism and border orientation, consistent with our conjecture that physical displays at the border reflect anxieties about globalization and cultural Others, at least for a subset of states for which data are available.

Control variables in Table 2 behave as we would expect. As discussed above, GDP per capita explains a relatively small proportion of the variation in border orientation but nevertheless remains positive and significant across all specifications.[31] In addition, every model shows that states *within* the Schengen Area have relatively low scores, suggesting that border commitments are reversible through institutional arrangements. Though democracies may tend to have more permissive border orientations, this coefficient is neither negative nor significant in most specifications.[32] A country's border orientation is strongly correlated with that of its neighbor, though several mechanisms could produce this result—competition, emulation, or simply geographic clustering of omitted variables. The average elevation at a country's border crossings has a negative, albeit insignificant coefficient, probably explained by a lower demand for movement and higher costs of infrastructural development.

[31] See World Bank (2015).

[32] Measured using the 21-point Polity2 Index (Marshall, Gurr, and Jaggers 2017). In cross-sectional regressions, this variable is negative and sometimes marginally significant (SI Appendix C, pp. 7–11).

Conclusion

Borders are crucial institutions in international and domestic politics. They are important sites of governance and have come to define what it means to be a modern state. International borders have at least as much salience domestically as they do internationally. They delineate the space over which states have jurisdiction; they also delineate the people for whom national public goods—from security to social services to stable political institutions—are to be provided (Goemans 2006). They may even shape the fundamental identity of a people by distinguishing the national from the transnational and the foreign.

All of these possibilities require a much richer understanding of the functions and meaning of international borders than has been typical in political science. Surprisingly little systematic investigation has been made into governments' fundamental orientation toward displays of border control. We suggest that the spatial orientation of governance—how starkly a polity signals control over filtering "us" from "them"—is as important as many of its other governing qualities, such as bureaucratic/administrative competence, civil–military relations, and state–society relations. While interstate territorial conflicts are among the most intractable a state may face, our findings suggest that modern border politics has less to do with traditional territorial integrity (Zacher 2001) and more to do with perceptions of nonstate threats to national sovereignty.

How might the concept of border orientation inform future research? One research agenda should focus on elaborating explanations for border orientation itself. We have focused here on land borders, and controlled for mountains, but further investigation may reveal distinctive geographical features, such as long coastlines, rivers, or expansive deserts, that might influence border orientation. Additionally, historical context should be more fully explored (Abramson and Carter 2016; Gavrilis 2008; Maier 2016). Historical rivalries, trade routes, imperial and national strategies of expansion and development, and long-established patterns of human settlement likely influence state displays at the border. Much more should be done to understand modern trends as well. If border orientation really is connected in some way to perceived threats of globalization, research should explore the mechanisms through which integrative pressures are translated into preferences and ultimately policy regarding the spatial orientation of state displays of authority.

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It may be that border orientation is less about economics and more about various threats to individual or group identity. The two may, of course, be related since one important source of identity is employment and occupational status (Carper 2017). Cultural identity, cultural threats, and "us" versus "them" ideologies such as populism should be explored in greater depth and with multiple methods. The association between surges in foreign-born residents and border thickening should be further tested and probed for the direction of causation, if any.[33] We suspect cultural explanations would be enriched by theories of distributive politics, with dominant groups who are gradually losing economic and cultural privileges making the loudest demands for displays of border control.

The richest payoff to studying border orientation will be to understand its consequences. Note that border orientation is a commitment to display authority; effectiveness (which would need to be carefully defined and measured) is not assumed. For policy relevance, it will be important to know whether attention to border control pays dividends—that is, whether it achieves some (un)articulated goal. Does a commitment to filter at the border reduce crime, illicit trafficking, and terrorism (Avdan and Gelpi 2016)? Affect trade (Carter and Poast 2020)? Reduce unauthorized inward migration (Allen, Dobbin, and Morten 2018)? Does a stringent border orientation have unintended consequences: Send hostile signals to neighbors? Stoke nationalism? Divert rather than reduce transnational crime (Getmanski, Grossman, and Wright 2019)? Encourage delay of costly internal measures in the face of transnational pandemics (Kenwick and Simmons 2020)? Or is it the case that the impact of these investments is largely in the eyes of the beholder, enhancing a sense of psychological rather than material security? By developing the concept of border orientation at the level of the nation-state, border dyads, and even border crossings and segments, there is now a way to investigate variance on authoritative state displays at the border to shed light on these issues.

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[33] Cultural identities have both shaped and been shaped by national political borders (Pelkmans 2006).

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix A: Validation and Posterior Predictive Checks
Appendix B: Residualization
Appendix C: Auxiliary Regression Results
Appendix D: Border Crossings Codebook
Appendix E: Border Police Data Visualization

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