Prestige, Proximity, and Prejudice: How Google Search Terms Diffuse across the World[1]

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A large literature examines the global diffusion of institutions and policies, yet there is much less systematic research on how cultural tastes, consumption preferences, and other individual interests spread across the globe. With a data set that tracks the most popular Google search terms in 199 countries between 2004 and 2014, and drawing on Gabriel de Tarde, this article introduces a theoretical framework to examine how country-level differences shape global imitation of cultural interests and consumer tastes. Contrary to popular accounts, this study finds that cross-national diffusion is surprisingly rare—and seldom U.S. led—but occurs through a multichannel network with many different centers. Negative binomial regression models applied to cases of diffusion in 346,620 country-year dyads reveal that global imitation flows are likely patterned by the power and prestige of countries, their proximities to each other, and the cultural boundaries between them. Accounting for factors such as the influence of large organizations does not disrupt these findings.

In recent decades, a large literature has begun to examine global diffusion processes across the social sciences. Most scholars study the cross-national spread

of political institutions and policies such as central bank independence (Polillo and Guillén 2005), market reforms (Henisz, Zelner, and Guillén 2005), or human rights legislation (Meyer et al. 1997; Lee and Strang 2006). Yet little is known about the global diffusion of less institutionalized phenomena such as cultural tastes, preferences for consumer products, or individual-level interests in sports, political events, news stories, and so forth. While much has been written on the globalization of cultural forms in broad theoretical terms (e.g., Ritzer 1993; Appadurai 1996; Tomlinson 1999)—or through case studies of how global cultural forms are locally adopted and transformed (e.g., Barber 1986; Hannerz 1989)—social scientists have not yet produced a systematic empirical analysis of the dissemination of cultural tastes, consumption preferences, and individual interests on a global scale.

This is no doubt because studying the global diffusion of these phenomena presents numerous empirical obstacles. Mapping global diffusion demands data that describe the prevalence of different interests and tastes not only across the globe but also across time. In order to avoid selection on the dependent variable, a careful study of these processes requires a comprehensive inventory of tastes, preferences, and interests that fail to diffuse across the globe. Even the most comprehensive cross-national data sets produced in recent decades (e.g., Ferreira and Waldfogel 2013) lack such scope and depth.

The rise of the Internet, however, has produced digital traces of human interests that provide an opportunity to advance the study of global diffusion in general (Lazer et al. 2009; Golder and Macy 2014; Evans and Aceves 2016) and of culture in particular (Bail 2014). In this article, we analyze the global spread of search terms on Google, the world's most popular website, across 199 countries from 2004 to 2014. Notwithstanding limitations that we note below, these data enable analysis of the spread of cultural tastes, consumer preferences, and individual interests across every country in the world.

To predict when and where diffusion will occur, we draw on a theoretical framework pioneered by Gabriel de Tarde, Durkheim's nemesis in 19th-century French sociology. According to Tarde, differences in power and prestige lead to a process of top-down cultural diffusion: actors who are situated at lower levels in these hierarchies imitate the cultural and behavioral styles of the more prestigious and powerful actors out of admiration or envy. Such "social imitation" is more likely when prestige hierarchies are steep and when actors are in close proximity to each other but less likely when they are separated by cultural boundaries (or "prejudice" in the words of Tarde). Although

1497

Tarde's work has been rediscovered in recent years (e.g., Latour 1988; Katz 2006), his theory of imitation has not yet been systematically applied to the study of diffusion.[2] We look to Tarde's work for inspiration, not to resuscitate a long forgotten pioneer of sociology but because Tarde's framework—which puts the spread of behavior and cultural tastes in a principally unbounded world at the center of the sociological enterprise (Rogers 1962, p. 40)—is well suited to study the global diffusion of cultural tastes, consumer products, and other individual-level interests.

To evaluate this theoretical framework, we created a data set that contains 195,189 popular terms that individuals in 199 countries searched for on Google between 2004 and 2014. We establish the temporal order in which these terms become popular across countries and relate these sequential relationships to (*a*) cross-national hierarchies of power and prestige, measured through a series of indicators for 16 different types of search terms (e.g., music, consumer products, or contemporary politics); (*b*) social proximity, established through geography, trade, and shared political ties between countries; and (*c*) cultural boundaries emerging from different colonial experiences, spoken languages, and religions. We also account for the role of corporations and other organizations with a global reach that may broadcast or otherwise influence the cross-national diffusion of cultural tastes, consumption preferences, and individual interests.

This article is organized as follows. We begin by reviewing the literature on global diffusion. We then describe Tarde's theory of imitation, noting how it addresses several lacunae within that literature and amending it to address the possible role of organizations in diffusion processes. Next, we describe how we collected, translated, consolidated, and classified Google search terms from 199 countries in 73 different languages. We also introduce the 33 cross-national data sources we employed to measure power and prestige hierarchies, social proximity, cultural boundaries, and a set of control variables such as differences in gross domestic product (GDP) or the number of Internet users between countries. We then present descriptive analyses that indicate that cross-national diffusion of search terms is relatively rare. Contrary to early theoretical treatises on globalization (e.g., Ritzer 1993; Barber 1995), we further show that diffusion is seldom U.S. led. Instead, cross-national diffusion proceeds through a multichannel, variegated network of relationships with many centers. Instead of a system of highways with heavy traffic on the main arteries, in other words, we find the global diffusion of search terms resembles a network of country roads, each traveled rather infrequently. Finally, we present results from negative binomial regression models that indicate that differences in power and prestige across countries are the most powerful

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[2] Tarde has been dubbed, however, the posthumous "founding father of innovation diffusion research" by some (Kinnunen 1996).

predictors of how their residents adopt one another's search behavior, followed closely by social proximity and cultural boundaries. A separate section discusses potential confounding mechanisms, especially how transnational organizations (such as the Fédération Internationale de Football Association [FIFA]) or corporations (such as Apple) broadcast or otherwise promote their products or events worldwide. We conclude by discussing some limitations of this research—especially the lack of direct, individual-level evidence of imitation—but also the implications of our findings for future research on global diffusion processes as well as the emerging field of computational social science.

THEORIZING GLOBAL DIFFUSION PROCESSES

The study of global diffusion processes has evolved across three bodies of research that span sociology, political science, and anthropology. For their part, sociologists and political scientists have been primarily concerned with the global diffusion of institutions and policies (Dobbin, Simmons, and Garrett 2007; Gilardi 2012). This includes the spread of democracy (Gleditsch and Ward 2006), organizational forms within companies (Teece 1980), modern museums (Prösler 1995), compulsory primary education (Meyer, Ramirez, and Soysal 1992), bilateral investment treaties (Elkins, Guzman, and Simmons 2006), the decriminalization of homosexuality (Frank and McEneaney 1999), gender quotas for parliaments (Caul 2001; Fallon, Swiss, and Viterna 2012), and so on.

Although institutionalist explanations of global diffusion have developed somewhat orthogonal to one another in sociology and political science (Dobbin et al. 2007), researchers have come to agree—or nearly agree—on four mechanisms that shape such processes (Gilardi 2012), even if they often disagree on terminology and on which of these are the most frequent. The first of these mechanisms is coercion, which Gilardi (2012) defines as the imposition of a policy by powerful national or international institutions that control resources on which subordinate actors depend. The second mechanism is competition: organizations such as modern states adopt the policies, bureaucratic structures, and so on, of those states that are most efficient in the relevant domain—including economic, military, or political markets. The third mechanism is emulation, that is, the adoption of a practice because it conforms, in the eyes of adopters, to a normative standard. Emulation stands at the core of the sociological branch of diffusion research that has been influenced by DiMaggio and Powell (1983), on the one hand, and John Meyer (and his students), on the other. Meyer's world polity theory focuses on global diffusion processes and argues that those institutional templates that conform to a dominant world culture based on the principles of universalism, rationalism, equality, and progress are most likely to be emulated across the globe

1499

(Meyer and Rowan 1977; Meyer et al. 1997). World polity theory has inspired a generation of work that applies this concept to a variety of domains—from education to environmental policy (Frank, Hironaka, and Schofer 2000; Schofer and Meyer 2005).[3] In these accounts, emulation is driven by professionals, often organized transnationally in international nongovernmental organizations (Krücken and Drori 2009; Meyer 2010), and normative principles according to which institutions and policies should be structured (DiMaggio and Powell 1983).

The final mechanism of global diffusion emphasized by previous studies is social learning (Dobbin et al. 2007). Learning occurs "when organizational technologies are poorly understood, when goals are ambiguous, or when the environment creates symbolic uncertainty" (Powell and DiMaggio 1991, p. 69). In the face of such uncertainty, organizations often imitate one another—typically after observing peers or competitors—in order to determine which of the available institutional templates is most effective to solve common problems. In contrast to emulation, learning is based on not the perceived normative legitimacy of a practice but on its perceived efficacy. This mechanism is emphasized by the literature on policy learning, which shows that countries copy the successes of their peers, transforming not only social policies but also broader understandings of the root causes of social problems (e.g., Haas 1989; Elkins and Simmons 2005).

In our view, there are two limitations of this institutionalist research paradigm. First, the vast majority of these studies select on the dependent variable. That is, they focus almost exclusively on institutions that were adopted widely but ignore the presumably much larger group of institutions that do not diffuse.[4] This makes it difficult to estimate both the extent of diffusion processes and, more importantly, the conditions under which diffusion occurs (Dobbin et al. 2007). For example, if all policies and institutions diffuse because they are already compatible with existing behaviors, beliefs, and practices, one would not be able to discover this regularity since there is no variation in the independent variable. Similarly, it is difficult to determine whether social policies diffuse because of learning or emulation processes unless we can observe cases in which highly effective or legitimate policies did not diffuse (Lee and Strang 2006; Dobbin et al. 2007).[5]

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[3] For detailed overviews of this literature, see Krücken and Drori (2009) and Meyer (2010).

[4] An important exception is Lee and Strang (2006), who show that policies that downsize government diffuse when countries observe such strategies benefiting their peers. Yet when expert evidence from economists suggested downsizing was prudent but real-world evidence contradicted this evidence, countries do not learn from their more powerful peers. Similarly, Strang and Macy (2001) use agent-based models to identify the impact of negative cases of the diffusion of management fads.

[5] The organizational ecology approach, by contrast, avoids some of these problems by focusing on the entire population of institutional forms (whether diffusing or not) that one

1500

The second limitation of existing diffusion research consists in the focus on formal organizations, public policies, and political institutions. To be sure, such a focus is entirely appropriate given the substantive interests of organizational sociology and comparative politics. For diffusion research as a whole, however, this overlooks a considerable amount of other, more ephemeral forms of cross-national diffusion. Arguably, cultural forms (e.g., music genres or movie styles) and individual-level interests (e.g., sports, news stories, or consumer products) are even more prone to diffuse because these operate in markets that are less restricted by geopolitical boundaries and institutional decision-making processes. Anyone in the world can become a fan of Lady Gaga, for example, without awaiting a political decision based on the coordination of multiple actors with veto power. While there are attempts by some countries, notably France and Canada—but also China and Japan—to regulate the movie and music industries in order to promote national cultural traditions, they have done so with limited success (Ulff-Møller 2001). Furthermore, the Internet has made existing, weakly institutionalized global treaties that legitimized "cultural protections" within the World Trade Organization or UNESCO ineffective (Burri 2012, 2016). Global diffusion research could therefore profit from more attention to "soft," or less institutionalized, phenomena such as the spread of cultural tastes, consumption preferences, and other individual interests.

This brings us to a second strand of literature—produced primarily by anthropologists and cultural sociologists—which examines the global diffusion of cultural forms. These studies emerged as part of a burgeoning agenda of globalization research in the 1980s and 1990s. Early on, most authors argued that globalization led to cultural homogenization, threatening the diversity of existing sociocultural practices—particularly in the global South (Schiller 1976; Hamelink 1983; Gans 1985; Iyer 1989; Godelier 1996). Studies in this tradition suggested that the world was being westernized (Latouche 1996), "McDonaldized" (Ritzer 1993), Coca-colonized (Howes 1996), or otherwise subjugated by Western neoliberalism and consumerism (Sklair 1995, pp. 75–81), producing a singular "McWorld" (Barber 1995). Only a few championed the supposedly global civilization that globalization brought about for the first time in human history (e.g., Perlmutter 1991).

Most students of globalization eventually rejected the homogenization thesis—instead highlighting creolization, hybridization, and cultural syncretisms or the emergence of new cultural forms via mixing of global and local

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can find in a specific field and then studying rates of appearance and disappearance of organizations as well as the relative diversity or homogeneity of their institutional forms (Hannan and Freeman 1993). It has not, conversely, much to offer in terms of understanding the microprocesses through which new forms spread across a population. For a combination of the two approaches, see Haveman (1993).

1501

elements (Hannerz 1989; Robins 1991; Hall 1997; Tomlinson 1999; Lull 2000).[6] This is particularly true of many anthropological analyses in which the cunning local "David" usually knocks down the brute global "Goliath," to borrow Hannerz's (1995) metaphor. Globalizing cultural practices, in other words, are transformed and sometimes even reversed in their meaning as soon as they are drawn into local social universes (cf. Miller 1995). Indeed, some sociologists see globalization as a process that is mainly driven by such local dynamics of meaning making: global cultural objects only exist in their varied local manifestations (e.g., the term "glocalizing" invented by Robertson [1992]). Such local processes of reinterpretation, these authors argue, may become more important in a global age when they are freed from the control and surveillance of homogenizing nation-states (Beck 2000, p. 85).

In our assessment, this literature does not provide a systematic analysis of which cultural practices and consumer preferences will be adopted and transformed by whom, when, or why. Perhaps because of the lack of systematic, global data on cultural tastes and consumer preferences, most research operates on an abstract, conceptual level without testing more concrete hypotheses with empirical data. Appadurai (1996), for example, has experimented with the terms "floating narratives" and "global ethnoscapes" to capture the emerging landscape of cultural practices on a planetary level. Other authors have taken up the notion of "cosmopolitanism," which now carries an impressive array of different meanings (see Vertovec 2000). Finally, Hannerz's (1989) term "global ecumene" has risen to some prominence over the past two decades.

These conceptual innovations have usefully drawn our attention to zones of shared interest and interconnected communication that characterize today's world. They offer few analytical tools, however, to identify the precise mechanisms through which these horizons of shared interests and communicative integration have enlarged over time, why these interests and not others have become globalized, and why certain populations have become more deeply integrated into these global communities than others.

Given the limitations of the literature on globalization, it is tempting to turn back to the institutionalist literature discussed above to identify mechanisms that might channel the spread of cultural tastes and consumer interests across the globe. Upon closer inspection, however, most of the four mechanisms briefly discussed above appear unlikely to shape the global diffusion of culture. Coercion probably only influences the diffusion of ideas, tastes, or consumer interests in a handful of totalitarian states such as North Korea, which can control the flow of information across their borders. While large, global corporations such as Samsung certainly have considerable market power, they cannot coerce individuals across the world to pay attention to their prod-

[6] See also references in Appadurai (1996, p. 32).

1502

ucts, even though they might certainly influence the choice set of what individuals find interesting (an issue we discuss in detail below). The competition mechanism is also unlikely to shape cultural diffusion processes in a straightforward way because there is no immediate and clearly discernible advantage in terms of income or power of adopting a cultural taste or consumption object. If an individual refuses to listen to Lady Gaga, for example, she is unlikely to suffer consequences in terms of upward social mobility, political participation, or social status beyond her immediate peers. Similarly, individuals are unlikely to learn from one another on a global scale because it is difficult to observe the consequence of adopting a cultural taste that originated far away. How would a woman in Bangladesh know whether listening to Lady Gaga in the United States has proved to bring to her local fans status, power, or income?

Emulation—the adoption of an institution or social policy because it is considered the most legitimate—is perhaps the mechanism that can be most easily transferred to the domain of cultural interests and consumer tastes. However, most institutionalist theories do not specify whose models will be emulated in a way that can be easily applied to cultural tastes, consumption preferences, and other individual interests. In Powell and DiMaggio's (1991) theoretical framework, the institutional templates that diffuse most often are those that were initially the most successful. This argument thus bends backward to the learning mechanism. According to Meyer (2010), institutional templates that are part of a rational world culture will appear as the most legitimate. Individuals, however, do not know which cultural forms are part of the globally legitimate canon, while governments (the focus of the institutionalist research tradition) do acquire such knowledge because they are repeatedly exposed to the pressures of international governmental or nongovernmental organizations. Put differently, individuals around the world might become interested in Lady Gaga's songs not because they know that her musical style is part of an abstract world culture but because they heard about her performance during the 2016 Super Bowl, which took place in a country perceived as powerful and prestigious by many. As we will soon discuss, such microlevel mechanisms fit neatly into Tarde's theory of imitation. More broadly, Tarde's theory contains a set of mechanisms that are well designed to understand the kind of diffusion processes that we study in this article.

Tarde's Theory of Imitation

Tarde is most often remembered for his famous disagreement with Durkheim about the foundations of social life (social influence vs. normative integration) and the metatheoretical principles most appropriate to understand it (methodological individualism vs. macrosocial structuralism). Although he was still cited regularly in the early 20th century—for example, in the ca-

1503

nonical Park and Burgess (1931)—he was subsequently forgotten by most. Tarde's work was then rediscovered by Clark (1969), who translated a series of his essays into English, and more recently by Latour (2002, 2007). There is also a group of German sociologists who have recently turned to Tarde (e.g., Borch 2013), as well as scholars of political communication (e.g., Eliasoph 2004; Katz 2006; Borch and Stäheli 2009) and British anthropologists and geographers (Candea 2012). Most of this discussion centers on the micro-sociological aspects of Tarde's oeuvre, including his theory of action, his notion of the social, and his opposition to macrosociology à la Durkheim (King 2016).

Latour (2002, 2007), for example, claims Tarde as the "grandfather" of his own actor network theory. Latour wholeheartedly adopts Tarde's Leibnizian ontology (or "monadology" more specifically): his radical opposition to seeing society as a macrophenomenon with its own "emergent" properties, irreducible to the individual level, and his equally radical criticism of analyzing human society as detached from and distinct from the natural world—a crucial element of the Durkheimian program to analyze "social facts." Instead, Tarde proposed to see the micro as more complex than the macro, to reduce macrolevel phenomena to the microprocesses that generate it, to include physical objects and processes into the configurations of connections that sociology should investigate, and so on. Our adoption of Tarde goes in the opposite way, as it were, than Latour's. We do not embrace Tarde's ontological principles or his monadic reductionism but draw inspiration from his more precise sociological analysis of a specific social process, that of diffusion. By contrast, *Les Lois de l'imitation*—Tarde's (1890) work that is of central interest for our study—is never cited in Latour's (2002, 2007) exegesis of Tarde's work, nor is Latour interested in other more specific sociological theories put forward by Tarde.

As far as we know, no one has taken Tarde's theory of imitation to the field of diffusion research proper.[7] Apart from his rather erratic and heavy writing style (deplored even by Latour [2002], p. 118), this may be due to his hyperindividualist ontology and the rejection of the possibility of a macrosociology, which obviously square very badly with the institutionalist traditions of diffusion research that came to dominate sociology and political science, as discussed above. While Tarde's approach is certainly better suited to study relatively unstructured and weakly organized fields such as the global arena of cultural tastes and consumer preferences, more consideration of mesolevel institutional mechanisms is in order even here. Since we are not bound by Tarde's radical ontological and methodological individualism, we will therefore amend

[7] But see Katz (1999) for a programmatic statement on the promise of Tarde for the study of diffusion.

1504

his theoretical framework to address the role of organizations in diffusion processes, as we discuss in further detail below.

Tarde's (1890) theory of diffusion is most systematically outlined in *Les Lois de l'imitation*. Unlike Durkheim, Tarde was not interested in the problem of social integration but conceived of society as a principally unbounded agglomeration of individuals tied together by bonds of mutual influence. In this open-ended, potentially global network of "hundreds of million individuals" (p. 65), these individuals orient their actions toward others, driven by the desire to gain status, avoid shame, and be recognized by their peers. While this basic assumption is quite in line with much neoinstitutionalist theorizing in contemporary sociology, Tarde's theory of imitation specifies the mechanisms in different and—given the empirical topic at hand—perhaps more appropriate ways, as we will soon discuss.

Tarde saw imitation as the basic principle of social life creating resemblances in cultural forms and behavioral patterns, on par with genetic inheritance in the natural world and vibration in the physical world (see fig. 1 for an overview). He further distinguished between intrinsically driven imitation (such as adopting a computer because of its advantages over predigital forms of information processing) from socially driven imitation, which he saw governed by the "non-logical laws of imitation" (Tarde 1890, p. 141). We focus here on this latter aspect of his overall theoretical framework, highlighted in gray within figure 1, which we consider most relevant for the study of global diffusion processes in the realms of consumption and cultural taste. Tarde himself, we note, argued that nonlogical laws of imitation usually trump intrinsically motivated, "logical" forms of imitation (p. 215).

The driving force of social imitation is the desire of individuals to adopt the practices, beliefs, and behaviors of individuals with more power and prestige. Those who come up with successful innovations, in turn, will occupy the top of the social ladder (Tarde 1890, p. 235), and others will subsequently adopt their innovations. According to Tarde, imitation therefore proceeds top down, from the more powerful and prestigious individuals, classes, nations (p. 198), or even civilizations (p. 239) to the less powerful and prestigious individuals, classes, nations, or civilizations (p. 215).[8] This process is not based on rational choices but motivated by emotions and desires, most importantly envy of the

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[8] Tarde does not consider bottom-up imitation processes, such as when items of popular or lower-class culture are adopted by elites (e.g., bouillabaisse in French cuisine). One might argue that the widespread diffusion of such popular cultural items is conditional on elite adoption (bouillabaisse would otherwise have remained a dish of Marseille's fishermen), such that the transformed popular cultural item becomes yet another innovation that social superiors introduce into the wider cultural arena, thus folding these cases back into the theoretical framework. How frequent such processes are is obviously a matter of empirics, rather than theoretical principle. Our research design is well suited to uncover bottom-up diffusion within the global realm as well.
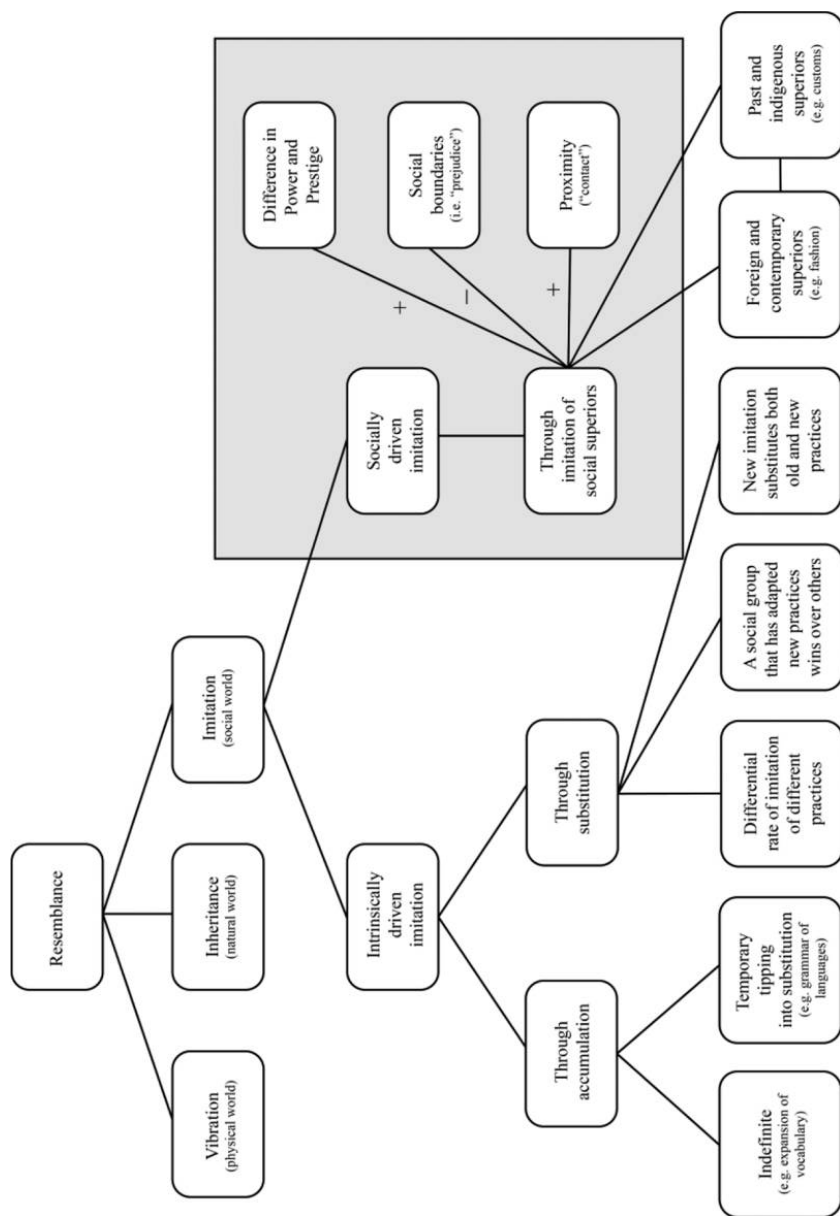
FIG. 1.—Tarde's theory of imitation

more well-to-do (p. 201), as well as obedience, trust, and the "devotion and . . . loving admiration" (p. 202) of social superiors. Our first hypothesis derives in a straightforward manner from the general argument: the greater the inequality in power and prestige, the more social subordinates are motivated to imitate their superiors (p. 217).[9]

According to Tarde, this tendency is moderated by two additional factors (see fig. 1), both of which influence the degree to which imitation will take place by shaping the set of practices of which individuals are aware. In other words, they influence the set of things that individuals can choose to imitate. The first factor is social proximity, which increases as superiors and subordinates come into contact and communicate with one another and therefore become aware of one another's behavior and consumption practices. Tarde thus foreshadowed a central theme of network-based diffusion studies that emerged from the 1960s onward (Valente 1995): increasing social proximity (e.g., through democratization or modern media) accelerates imitation processes in turn.

Second, antipathy between groups of individuals impedes imitation. As Tarde argues, "racial pride and prejudice . . . between different families and tribes and peoples and, within each people or tribe, between different classes" (1890, p. 367) reduce the chances that dominated groups will adopt the cultural practices and behaviors espoused by their social superiors. In other words, prejudice creates boundaries within the choice set of individuals, reducing the horizon of possible objects of imitation to the practices of the ingroup. We will specify this idea further by arguing that broad cultural commonality—as established by shared history, language, or religion—increases the chances that individuals will positively identify with one another and consider one another's practices as candidates that they then choose to imitate (or not).[10]

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[9] Tarde also noted, however, that the lessening of inequality over time leads to even more imitation, as superiors become within reach of the subordinates (1890, p. 224, citing the example of democratization). The two statements are not easily reconciled with each other without additional specification of scope conditions, and we therefore pursue only the more straightforward, cross-sectional part of the argument here.

[10] Tarde further distinguishes two types of social imitation (1890, pp. 244–93): if social superiors come from outside of an individual's primary group—and if they are contemporaries of the focal individuals—he speaks of fashions, trends, fads, cascades, and so on. This is the type of social imitation that we focus on in this article. Interestingly, he introduces a second type of imitation that describes mimicry of ancestors, which are indigenous (as opposed to foreign) and have already passed away. In other words, Tarde subsumes customs as well as traditional norms and values under his theory of imitation. Imitation of outside contemporaries and that of ancestors follow upon each other in cycles: cosmopolitan openness to outside fashions gives way to a period of indigenization, during which these very same practices become associated with one's forefathers and thus integrated into local traditions (p. 293).

1507

Addressing the role of organizations in global diffusion processes.—For all of its promise to explain contemporary diffusion, Tarde's hyperindividualism is not compatible with the contemporary reality in which organizations of all sorts have considerable influence on the spread of cultural products, interests, and ideas. To begin, powerful organizations can influence which cultural objects consumed by social superiors are presented to those further down the prestige hierarchy and, thus, available for imitation. Corporations, for example, offer certain consumer goods with a flair of social superiority but not others, TV stations show series in which the lifestyle of one type of elite is displayed but not that of another type, government agencies promote the adoption of certain middle-class educational practices to their working-class citizens but not others, and so on. In other words, individuals' choice sets are influenced not only by social proximity and cultural boundaries but also by organizations. Below, however, we show that the influence of organizations is not nearly as total as some might believe in the Internet age, where individuals can stumble across a vast range of objects of potential interest with minimal effort.

Second—and also in line with basic institutionalist theory—we amend Tarde's theory by assuming that not only individuals but also organizations imitate one another. For example, it is possible that the news organizations of less prestigious and powerful countries (let us say Belarus) look to the news organizations of more prestigious and powerful countries (e.g., Russia) when searching for stories to write about or televise. Such organizational-level imitation might explain why individuals in Belarus then become interested in Russian stories or events. Similarly, online shopping platforms in less prestigious and powerful countries might orient what products they offer by imitating the online shopping platforms of more prestigious and powerful countries.

Note that this modified framework still differs from classic institutionalist theories of diffusion. It does not suppose that powerful organizations can entirely dictate what consumption practices the world's citizens adopt (i.e., the coercion mechanism discussed above), nor does it assume that organizations that imitate one another do so in order to conform to global norms (as in normative emulation à la world polity theory) or because they think that other organizations are more efficient (as in learning and competition mechanisms). In the empirical analyses that follow, we consider not only how Tarde's central mechanisms of prestige, social proximity, and cultural boundaries influence patterns of global cultural diffusion but also the degree to which these organizational effects confound these mechanisms.

A Tardean Model of Global Diffusion Processes

Before describing how we employ this modified Tardean theory to explain global diffusion processes, we must first clarify an issue of terminology. From here on, we denote the spread of tastes and interests across countries as "dif-

fusion," in order to remain in line with contemporary usage of the term (but see Elkins and Simmons 2005). We reserve the term "imitation" for the more specific Tardean mechanism that we seek to explore here—that is, the socially motivated imitation of contemporary superiors outside an individual's core group. Imitation therefore represents a subset of the more general term diffusion. In order to identify diffusion, we rely on the temporal aspect of the process, in line with mainstream diffusion research: whenever a cultural taste, consumption preference, or other individual interest is adopted by individuals of a country after this very same interest, preference, or taste has been expressed by individuals of a more powerful or prestigious country, we code this as a case of diffusion.

From Tarde's theory we derive three hypotheses. First, imitation is more likely, the larger the prestige and power difference between countries (hypothesis 1); the more the respective populations are in geographic, social, or economic contact with one another (hypothesis 2); and the weaker the cultural boundaries, established by differences in religion, historical experiences of colonial subjugation, or spoken languages, which give rise to "prejudice" in Tarde's words (hypothesis 3). Seen together, these three hypotheses capture how the general tendency of social imitation is modified—or even suppressed—by the other two mechanisms, producing flows of imitation that are channeled by social boundaries and facilitated by social proximity.

To be sure, these hypotheses are not incompatible with other theoretical traditions in diffusion research. Studying how diffusion is moderated by social contact and proximity—including trade, political connections, and the like—has been recognized as an important consideration since Rogers's (1962) seminal review of the diffusion literature and forms a standard argument of cascade models and other social influence approaches to diffusion (e.g., Watts 1999), as well as the literature on the diffusion of social policies and institutions (e.g., Elkins et al. 2006; Lee and Strang 2006). Many others (e.g., Waltman 1980; Strang 1991; Elkins and Simmons 2005) have argued that shared cultural traditions or historical experiences facilitate diffusion. Likewise, the hypothesis that differences in power and prestige play a role in diffusion has appeared within cultural sociology—perhaps most prominently Bourdieu's (1984, p. 220) observation that bourgeois elites invent new elements of cultural distinction once the lower classes have started to emulate their previous practices. But this represents an argument of only tangential relevance for Bourdieu and other cultural sociologists and thus can be considered the most original contribution that Tarde made to our understanding of processes of cultural change through diffusion.[11]

[11] Tarde's book appeared a decade before Veblen (1899) but shares certain common themes with this work, such as the cultural elements of stratification (anticipating major elements of Bourdieu's theory of distinction). Veblen, however, was more interested in

1509

In short, the Tardean framework offers several distinct advantages over other major strands of global diffusion research. First, it describes the diffusion of individual-level behavior rather than the governmental institutions and policies that are typically studied in the mainstream diffusion literature. Second, and relatedly, it presents a perspective better suited for social domains that are weakly institutionalized—such as the global arena of consumption practices, individual interests, and cultural tastes—although we will empirically assess how far transnationally operating organizations shape global diffusion patterns in such domains as well. Third, it introduces a set of precise mechanisms—social imitation as moderated by proximity and boundaries—that explain how the diffusion of individual tastes, preferences, and interests operates. Such a sharply defined set of analytical hypotheses also represents a significant advance on other theoretical apparatuses available for the study of cultural globalization within anthropology and sociology.

RESEARCH DESIGN

As we mentioned at the outset, systematic analysis of the global diffusion of cultural interests, consumer tastes, and other interests is rare. The few studies of cross-national diffusion that currently exist use data sets that describe consumption practices or cultural tastes among highly developed countries only (e.g., Deutsch and Merritt 1979; Fiss and Hirsch 2005; Ferreira and Waldfogel 2013). These data are limited in scope, not only because they ignore a majority of countries in the world but also because they only contain the most powerful and prestigious countries and are thus less appropriate to explore whether diffusion processes are driven by the type of power and prestige differences that we emphasize above. Furthermore, the sequential nature of diffusion processes requires longitudinal data in order to determine whether individuals in one country imitate those in other countries over time. Finally—as with any study of diffusion—ignoring even a small number of actors who might imitate or be imitated by other actors can create network boundary problems that lead to mistaken conclusions (Laumann, Marsden,

how the institution of private property and the inequality associated with it lead to a general competition over property and the status it conferred, rather than with processes of cultural imitation. According the Veblen, the nonproductive elite (the "leisure class") used conspicuous consumption of products the producing classes could never afford to mark their superior status. He did foresee that the lower classes imitate, over time, the consumption habits of their superiors (p. 49), but they lacked the resources (including the time) to do so effectively (e.g., wearing the latest fashion), thus appearing morally and socially inferior to the leisure class (a Bourdieusian theme indeed). Emulation—"the stimulus of an invidious comparison which prompts us to outdo those with whom we are in the habit of classing ourselves" (p. 49)—therefore produces different results than Tardean imitation, which often results in the complete homogeneity of social practices.

and Prensky 1992). Our theoretical framework therefore requires data that cover the quotidian interests of a very large segment of humanity over time.

Perhaps unlike any other data source, Google Trends provides an opportunity to know what cultural products, consumption items, and information pique the interest of the world's population. Google Trends is a website that describes the 10 most popular and 10 "rising"—or increasingly popular—search terms by month between 2004 and 2014 in 199 countries, including many semisovereign political entities. According to the International Telecommunication Union of the United Nations (2015), 43% of the world's population currently has access to the Internet. As we discuss in further detail below, Google is the preferred search engine in every country apart from Russia and China.[12] Given Google's global market share of nearly 68%, we estimate that our data describe the Internet search behavior of approximately 32% of the world population, or approximately 2.2 billion individuals. In addition to their scope, the data are also highly granular. Trends in Google search terms can be tracked by month or week—and often at the daily level as well. This enables analysis of the temporal order in which search terms spread across the world—within limits that we discuss in further detail below—and what is perhaps the first analysis of cultural diffusion processes at a global scale.

Although Google Trends data thus capture the searches of a large share of the world's population, they are obviously not representative of the world population as a whole. First, there are considerable "digital divides"—or gaps in access to the Internet based on income and education. Even though these gaps appear to be rapidly closing as access to the Internet increases in many developing countries, much inequality remains within countries. Even among the population with access to the Internet, its actual use varies considerably—both in terms of time spent on the Internet and the kinds of tasks individuals perform while online (Ragnedda and Muschert 2013). While our data are nearly representative of the world population with access to the Internet, they certainly do not come close to a representative survey of what these connected individuals are interested in more broadly.

Moreover, Google is occasionally censored or blocked in some countries of North Africa, South Asia, East Asia, and the Caucasus, such that our data might misrepresent the actual interests of the population of these countries. In order to assess such possible bias, we conducted additional analyses, discussed further below, that employ data on government censorship collected

[12] According to the Internet ranking site Alexa.com, Google is the second search engine in Russia behind a local search engine called Yandex. In China, Google is ranked third behind the local search engines Baidu and Soso. We attempted to determine whether there are differences in the terms searched on Google versus the more popular local search engines in Russia and China. Unfortunately, Yandex, Baidu, and Soso do not report top searches by year in a format that is directly comparable to the Google Trends data.

1511

by Google itself. Adding this censorship variable does not alter our substantive results and conclusions.

Perhaps a more serious limitation for the purpose of this study is that Google Trends data only capture search terms that are either (*a*) popular enough to reach the top 10 search terms in a country during a given month or (*b*) growing quickly enough in their popularity to reach the top 10 most rapidly rising search terms for that country during the same time period. The data therefore do not include search terms that have significant popularity but never breach the top 10 or that grow too slowly to appear in the top 10 rising terms. In countries with significant search volume, it may take many more searches to reach these thresholds than in countries with lower overall search volume. Establishing temporal order between the search behaviors of different countries' individuals on this basis is therefore rather imprecise. To illustrate, it might be that individuals of country A searched for a term before individuals in country B, but the As did so at lower volumes than the Bs; in this case, our data would only capture the term in country B, as it is there that the term reached the top 10 most popular.[13]

We do not consider this a fatal flaw because of the significant volatility in the population of terms that either reach top 10 status or are among the 10 rising terms. Only 10.54% of terms in the data appear over more than one month in the same country. Given this volatility, we believe there is sufficient "space" at the top for search terms to break into, such that the rise and fall of top 10 search terms allows us to develop reasonable estimates of the sequence of when terms become popular across different countries.[14]

The most serious limitation of Google Trends data is that they are mostly aggregated at the country level, forcing us to use countries as units of obser-

[13] We attempted to determine how often this might be the case by choosing a random sample of 100 search terms from our data set. We then explored, for each country, when the term appeared for the first time. For more than 90% of the terms, we could not determine which country's population searched for the term first—below the top or rising 10 thresholds—because the term was already searched somewhere before January 2004, which is the first date available for data in Google Trends. In other words, using first appearance rather than entry into the top or rising terms would be unfeasible given current data limitations.

[14] To further explore this issue, we conducted analyses to test whether diffusion is affected by how many news stories originate within each country in our data set—since such stories may "crowd out" other search terms that might otherwise make the top 10 or top 10 rising terms. To do this, we employed the Integrated Conflict Early Warning System data set (Boschee et al. 2015), which describes news events in different countries over a time period that coincides with our study. We calculated the difference in the number of news stories within each country dyad that make up our universe of analysis and found that adding this measurement does not significantly influence our results. Clearly, however, our data describe the diffusion of popular search terms and not diffusion processes writ large.

1512

vation.[15] This means that we will not be able to show, with individual-level data, that the motivation for individuals to search certain search terms is indeed that they look up to individuals living in countries with higher prestige who have already become interested in this object. The possibility for causal inference is therefore very limited. But, using country populations as aggregated units of observation also offers important advantages since geopolitical boundaries often map onto cultural boundaries, such as shared historical experience or common religions, and onto social proximity, as established through trade or membership in political organizations, for example. Such data would be virtually impossible to collect at the individual level and on a global scale.

Data Collection, Validation, and Coding

We trained nine research assistants to transcribe the top 10 and top 10 rising search terms for 199 countries for all months available between 2004 and 2014 by visiting the Google Trends Explorer website (https://www.google .com/trends/explore). In total, the research team extracted the top 10 and top 10 rising terms from 24,329 unique country-year-month queries (e.g., Ghana-2012-March).[16] Data were collected in the original scripts (e.g., Latin, Arabic, Cyrillic) from a total of 73 languages. This initial data collection effort created a universe of 195,189 search terms.

Because the search terms were collected from Google Trends in the original scripts and languages, it was necessary to devise a method of determining when they referred to the same search query (e.g., "chansons" and "songs"). To do so, we used a combination of automated translation services and hand coding. We began by passing each term through Google Translate. While this service performs somewhat poorly on sentences, it translates single words much more effectively. We wrote computer scripts that employed this service via Google's Application Programming Interface to translate each of the non-English search terms into English. To ensure that we did not fall victim to imprecise Google translations, a member of the research team looked up the results of searching the term in the country-specific Google search engine and in its original language. For example, a search for the term "Saddam Hussein" in France would be verified by using the following URL: https://www .google.fr/#q=saddam+hussein. This secondary process of data validation

[15] Tarde himself thought that imitation processes might operate at the very micro (individual) all the way to the very macro (civilizational) level, with the country (or national) level somewhere in between (with regard to country level, see, e.g., Tarde [1903], p. 199).

[16] Although Google provides trends data for 245 countries and territories, we excluded 46 of these because they lacked sufficient web traffic to produce top search queries (e.g., in Antarctica, the Cook Islands, and the Vatican City) or because national censorship prevented Google from assessing their search term results (e.g., in North Korea).

1513

provided an opportunity for the coders to directly observe the search result that a user in a specific country would have obtained.

The coders also used country-specific Google links for each search term in order to consolidate duplicate terms. For example, individuals may use different terms to refer to the same person ("Benjamin Netanyahu" or "Netanyahu") or country ("United States," "America," "U.S.A," "U.S.," etc.). Failure to merge these distinctive search terms into a single term would therefore underestimate the extent of global diffusion processes. Given the sheer size of the corpus, we again combined automated and hand-coding techniques to merge equivalent search terms. First, we applied a near-matching algorithm that identified every pair of search terms that shared one or more words (e.g., "World Cup" and "FIFA World Cup"). Second, we applied another near-matching algorithm that identified every pair of search terms that differed only by one character (e.g., "game" and "games") using Levenshtein distances. Finally, two human coders analyzed each pair of possible duplicate terms identified via these automated techniques to determine whether they were substantially equivalent. These coders confirmed that terms should be merged by visiting the country-specific Google search result links just described.

Next, we eliminated search terms that did not express a specific interest or did not allow for the identification of imitation using the time range of our data set. First, we eliminated terms that describe (a) search engines such as Google or Yahoo, (b) mail providers such as Gmail or Hotmail, and (c) generic social networking sites such as Facebook and Twitter. These terms point at informational tools but not at a specific object of interest: searching for Google indicates that a person wants to search but not what she is searching for. Second, we removed all terms that describe Google products (such as Google Translate or Google Maps) because we could not be sure that such searches were not redirected by Google in an attempt to promote their own services. Finally, we removed 1,258 search terms that appear in the first week of the data set (between January 1 and 7, 2004) because these terms may have already appeared elsewhere, making the observation of imitation processes impossible.[17]

Our final data set contains 19,144 unique Google search terms (including terms that describe the same thing and that were merged by hand). Many of these terms are not prone to diffusion but represent "intrinsic" motivations that develop in parallel but separately across countries and parts of the world. Examples are seasonally recurring terms such as "Ramadan" or "Christmas." We elected not to eliminate such terms because doing so would reduce the universe of observations to terms that are likely to diffuse—which would re-

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[17] This truncation problem obviously also exists, albeit in more attenuated form, for the terms appearing after January 7, 2004.

1514

sult in a similar kind of bias to that of the institutionalist research tradition that we criticized above.

In the final coding stage, we generated an inductive typology to classify search terms into substantive types, based on inspection of the first 1,000 terms. This typology contains 16 types of terms, describing a range of interests such as music, geography, sports, contemporary politics, film and television, consumer products, and so on. Each of the terms was assigned to one of these 16 types, which we describe in further detail below. We also created subcategories for search terms that refer to individual names. For example, we created a subcategory for "musicians" within the "music" type and a subcategory of "athletes" within the "sports" type. As we will soon discuss, the number of terms associated with the 16 types varies significantly.[18]

Dependent Variable: Imitation between Country Dyads by Year

Our analysis proceeds in two stages. In the first stage, we describe the search terms that spread farthest across the globe, the frequency of cross-national diffusion more broadly, and the most common diffusion paths between countries. In the second stage, we employ multivariate models to evaluate the hypotheses derived from the modified Tardean theory. These models are applied to a dyadic, directed network data set that counts how many times individuals in one country searched for a term before it appeared in the other country of the dyad.

Although our original data set only had monthly granularity, we collected weekly or daily data—where available—for cases in which a term first appeared in the same month in both countries, thus allowing us to establish temporal order.[19] Nevertheless, we were forced to determine how we could identify diffusion through such temporal order when multiple countries (say, countries A and B) had already searched for a term before a third country (C). Since there is no way for us to know whether it was the population of country A or the population of country B that actually served as an inspiration for the Google users in country C, we decided to create two different versions of the dependent variable and run all analyses with both measures. The first measure, "sequential primacy," counts the appearance of a search term in C as a

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[18] Ideally, we would have refined the typology after completing a manual inspection of each search term and after having run initial analyses that lead to additional hypotheses. We would then use this more refined typology to recode all of the approximately 20,000 terms in our data set. Given the significant amount of labor involved in this process, however—which involves not only researching terms in multiple languages but also examining them using country-specific Google search engines—we elected not to proceed in this manner.

[19] There were a small number of cases for which we were only able to determine the month in which a term first appeared. In these cases, we assigned the same rank order to all countries where a search term occurred within this month.

1515

case of diffusion from both A and B. The second, more restricted, measure of diffusion—what we call "first-rank" imitation—assumes that diffusion proceeds from only one source, such that the term diffused from A to B and from A to C only.

A possible limitation of both outcome measures is that they are insensitive to time lags. That is, a term that appears in France in 2004 and Finland in 2014 could hypothetically count as influence in our measures. As we discuss in the appendix, however, our results are robust to using a cutoff point of one year to measure both sequential and first-rank influence. The median time lag between first and last appearance of terms that appear in at least two countries is 763 days, suggesting a time-insensitive measure of imitation is warranted.

Independent Variables: Weighted Status Difference
between Country Dyads

According to the first hypothesis developed above, power and prestige differences between countries will shape global imitation processes. Quite obviously, the relative standing of a country depends on the domain at hand. While a country such as France may enjoy high esteem for its cuisine, for example, it may hold less global status and power in other realms such as cellular phone technology. We therefore created a multidimensional index of power and prestige relying on separate indicators for each of the 16 types of terms that we had identified in the data set. Table 1 lists the frequency of these types of terms in order of their popularity. They include geography, film and TV, video games, music, sports, news, technology/hardware, education, consumer goods, government, software, contemporary politics, travel, banking, cuisine, and fashion.

We researched data sources that would indicate either the power or prestige of a country for each type of term. Ideally, we would use information on how individuals around the world evaluate the relative prestige of each country for each specific domain. No such data are available. We therefore have to use proxy variables. Table 1 lists the 21 data sources we used to establish country rankings in the domains corresponding to the 16 types of terms. Countries that were not listed in some of these rankings (e.g., Mauritius in the list of global financial centers) were assigned the lowest rank. Where production figures were available that described the total output of each country within a given domain, we used these as indicators of global power. This was the case for music (number of top-selling musicians), video games (number of game companies), film and TV (number of feature films), sports (number of Olympic victories and FIFA ranking), news (number of newsworthy events), technology (number of patents), software (number of top companies), banking (number of global financial centers), government (absolute size of government and

1516

number of memberships in international organizations), politics (an index of global economic and military power), travel (number of tourists), and consumer goods (number of top companies or brands). Where no such output data were available—or even conceivable—we relied on prestige rankings. This was the case for education (two university rankings), geography (UNESCO heritage sites and global cities index), fashion (most popular brands per country), and cuisine (number of top ranked restaurants).

The use of output data admittedly does not capture the Tardean mechanism of imitation as well as we might like because it risks confounding productivity with prestige. We therefore have to assume that the two are closely related: that a country with many Olympic gold medal winners, for example, will be perceived by the world's population as a high-status country in the domain of sports, while a country that never ever won a gold medal will not become a candidate for the "admiration or envy" of others, to use Tarde's words. We cannot corroborate this assumption because prestige rankings often contain only one focal country whose global standing is evaluated (such as the United States) or often relate to only one specific domain (e.g., international relations), and the surveys are not run in every country of the world or are not representative.

As we show below, the diffusion of popular Google search terms across countries is a surprisingly rare event. As a result, it was not possible to examine imitation within each type of term separately because of sample size limitations. We therefore created a single index of power and prestige by taking the inverse of its average rank across all types of terms, weighted by the total frequency of each type of term. We rescale the variable from 0 to 10 for ease of interpretation.[20] Table 2 describes the top 20 countries according to this weighted prestige score. The United States received the highest score, followed by China, the United Kingdom, Japan, Germany, and France. The key independent variable designed to evaluate the core hypothesis is the difference in weighted status rank between the two countries that together form a dyad. This measure thus describes the extent of status differentials within each directed country dyad.

Cultural Boundaries

The second hypothesis is that cultural boundaries shape the likelihood of global imitation because cultural tastes and consumer items that originate outside of one's own cultural sphere may be more difficult to incorporate

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[20] We calculate this aggregate power and prestige rank as follows: $(1/\Sigma_{jt}^{N} s_w) \times 10$, where j describes a country we observe at time t and s describes its status score weighted by a matrix w of frequency scores for each type of term we observe within our data.

TABLE 1
NUMBER OF TERMS BY TYPE AND DATA SETS USED TO CREATE COUNTRY RANKING IN POWER AND PRESTIGE

Type	Frequency	Variable Used	Data Source	Country Ranking Measure
Geography	22,412	UN world heritage sites	UNESCO	Cumulative sum of sites in country by year (2004–14)
		Global Cities Index	A. T. Kearny Consulting Firm	Inverse rank sum of all cities ranked by country
Film and TV	17,583	Feature films	UNESCO	Average number of films produced in country per year (2005–11)
Video games	4,780	Top video games	Wikipedia	Count of games by country of production
Music	6,855	Top musical artists by gross record sales	United World Chart	Inverse rank sum of all artists ranked by nationality (2004–14)
Sports	12,622	FIFA World Cup rank	FIFA	World Cup ranking (2002–15)
		Olympic profile	Wikipedia	No. of medals earned in prior two Olympic Games (2004–14)
News	13,902	Media attention	ICEWS Event Dataset	No. of news stories about country by year (2004–14)
Technology/ hardware	4,917	Patent productivity	World Intellectual Property Organization	Average no. of international patents filed by country per year (2004–12); 2012 data carried forward
Education	8,559	University rankings	Academic Ranking of World Universities	Inverse rank sum of all schools ranked in country (2004–14)
			Times Higher Education	Inverse rank sum of all schools ranked in country (2011–14); 2011 data carried backward

Consumer goods	6,269	Top companies and brands	Forbes Global 2000	Inverse rank sum of companies ranked that are headquartered in country by year (2006–11); 2006 data carried backward, 2011 data carried forward
			Forbes Worlds Most Valuable Brands	Inverse rank sum of brands ranked that are headquartered in country by year (2012–15); 2012 data carried backward
Government	5,971	Intergovernmental organization memberships and government expenditure	Correlates of War	No. of international government organization memberships by country
			World Bank	Total government expenditure (2004–14)
Software	3,396	Top software companies	Software Magazine	Inverse rank sum of all companies ranked that are headquartered in country by year (2004–14)
Contemporary politics	3,804	Polity IV and Composite Index of National Capabilities	Polity IV; Correlates of War	Country ranking (2004–14)
Travel	2,632	World tourism ranking	World Bank	Average no. of tourists visiting country per year (2004–12)
Banking	2,330	Financial centers	Global Financial Centers Index, Z/Yen Group	Inverse rank sum of all cities ranked in country by year; 2014 data carried backward
Cuisine	336	Restaurant rankings	La Liste, curated by the French foreign ministry	Inverse rank sum of all restaurants ranked in country; 2015 data carried backward
Fashion	281	Popularity of fashion brands on Facebook	Fashion United	Inverse rank sum of companies that are headquartered in country; 2016 data carried backward

1519

TABLE 2
TOP 20 COUNTRIES ACCORDING TO WEIGHTED STATUS RANK

Country	Status
United States.	9.92
China.	9.38
United Kingdom.	9.37
Japan.	9.35
Germany	9.33
France.	9.19
India	8.61
Canada	8.51
Russia	8.46
South Korea	8.43
Italy.	8.37
Spain	8.26
Australia	8.14
Brazil.	7.99
Switzerland	7.74
Mexico.	7.61
Turkey	7.59
Nigeria	7.28
Belgium.	7.22
Argentina	7.20

into one's already established set of cultural practices. We created three measures that describe the strength of such boundaries within each country dyad in the data set, one for each major domain often associated with culture: language, religion, and history. This specification of boundaries is compatible with Tarde's emphasis on "prejudice" but perhaps even more evidently linked to the Deutschean theory of communication and contact. According to Deutsch (1953), shared language and religion—as well as historically established channels of communication—allow mutual acculturation of actors and, thus, cultural homogenization (e.g., Deutsch 1953).

To measure cultural boundaries, we first collected data from the CIA World Factbook that describe the number of people who speak distinctive languages within each country. We then calculated the percentage of people in each country who speak one of the 348 languages collected from this source and created a linguistic dissimilarity measure using the Euclidean distance between each country dyad within this data set. To identify religious dissimilarity, we proceeded in a similar manner, using data on the percentage of people who belong to one of 35 major religious denominations described in the World Religion Dataset (Maoz and Henderson 2013). Finally, we used data from the CIA World Factbook to create a list of colonial powers and their former colonies and generate an adjacency matrix of countries based on shared colonial experiences. We created a dummy variable

1520

that describes whether any two countries share the experience of having been subjugated by the same empire.[21]

Social Proximity

Our third hypothesis refers to social proximity. Whereas cultural boundaries should decrease the likelihood of imitation between two countries, the social proximity of countries should increase it. We identified measures for geographic, economic, and political proximity between the countries of each dyad, in line with what has now become the standard in policy diffusion research where such "spatial lags" now include economic and political measures beyond simple geographic proximity (e.g., Simmons and Elkins 2004).

We measured geographic proximity by subtracting the distance between the most central global positioning system coordinates within each country from the maximal distance between two points on the globe. We measured economic proximity using yearly data from the International Monetary Fund that describe the total volume of trade between each country dyad in U.S. dollars (by year). We measured political proximity by creating a matrix of shared membership in international nongovernmental organizations and intergovernmental organizations using data collected by the CIA World Factbook in 2012. We then measured the political proximity of a country dyad by calculating the inverse of the Euclidean distance between each country pair. This latter measurement thus accounts for the influence of governmental and nongovernmental organizations, which is central to the world polity theory of Meyer and colleagues (Krücken and Drori 2009).

Finally, we used a variable that measures the social proximity generated through personal connections between actual individuals. For the country level at which we are forced to operate, we found data that describe the prevalence of Facebook friendships between individuals in nearly every country in the data set. For each country, these data describe the top five countries with which individuals in the focal country maintain Facebook friends. These data thus describe a direct individual-to-individual channel of communication on social media—albeit incomplete, since it does not map the total number of Facebook friendships between all country pairs. In ad-

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[21] To be sure, all three measures might also capture organizational influence on diffusion processes: companies or news agencies might target countries of similar linguistic, religious, or historical heritage. This, however, would represent an amplification, rather than an alterative, to the individual-level mechanism we propose. Such companies anticipate that it does not make sense to market Spanish television series in Russia, cricket in Algeria, or Ramadan sweets in Japan because they know that Russians do not understand Spanish and therefore will not appreciate Spanish entertainment, Algerians do not care that much about cricket on average, and very few Muslims live in Japan.

dition, these data are unfortunately only available for one point in time and do not take into account the many other person-to-person channels of diffusion such as telephones or SMS (short message service) messaging. We therefore do not employ these data within our main multivariate models but analyze them in a separate section where we also explore how organizations shape cross-national diffusion.

Controls

In addition to the variables we use to evaluate the Tardean hypotheses, we recognize that a variety of factors may influence global diffusion patterns. Most importantly, globally operating organizations—such as corporations, sports associations, or news organizations—may influence the pattern of global diffusion by determining what issues, products, or events individuals encounter in their daily lives. To partially account for this dynamic, we measure differences in the capacity of large organizations to influence diffusion patterns by including a control for GDP differentials between country dyads within our models. This is because organizations operating out of wealthier countries are likely to have more dedicated resources to promote their cultural products or ideas and also enjoy greater capacity to produce new consumer goods and cultural products because of the size of their economies. Big economies might thus exert market power over small countries and impose their own products and ideas on the rest of the world, independent of the rest of the world's desire to imitate the economically more powerful country. In a separate section after the main regression results, we present a much more detailed analysis of how organizations may shape cross-national diffusion by including a measure of organizational promotion or broadcasting that we hand coded for individual search terms.

All models also control for differences in the size of populations within each country dyad. If the distribution of search terms was purely stochastic, it is likely that new terms would first appear in large populations with more opportunities for innovation. Therefore, we calculate the difference in population size between the countries of each country dyad using the World Bank Development Indicators. We also control for the difference in total number of Internet users for each country dyad using data from the International Telecommunication Union of the United Nations, since countries with more Internet users may also exert greater influence on cross-national diffusion.

As we discussed above, we further recognize that some governments control what can be searched on Google. Countries in which Google is regularly censored by governments may be less likely to imitate those where this does not happen as frequently because their populations' choices are restricted. To account for this, we obtained data that describe the total number of

1522

government-sponsored censorship requests made to Google by year using publicly available data from Google itself. To account for Google's variable market share by country, we also include a measure of Google's market share that is the inverse of the rank of Google in the list of the top 25 Internet sites for each country from Alexa.com, a prominent website ranking service. We do not include these two controls in our main models, however, because of their limited diversity.[22] Supplementary analyses—which are available on request—indicate that the inclusion of both variables does not substantively alter our main conclusions.

Modeling Strategy

We discovered significant kurtosis in both dependent variables, which describe the number of times country B searches for a term for which country A has already searched. Because tests for overdispersion were also significant, we employ negative binomial regression models with fixed effects for years, in order to evaluate the association between imitation and each of the variables described above. We detected no evidence of multicollinearity in the models but employ robust standard errors because tests for heteroscedasticity were positive.[23]

DESCRIPTIVE RESULTS

Most Popular Search Terms

Since this is the first empirical study of this nature, the descriptive results are interesting by themselves. We present two types of descriptive analyses. The first takes search terms as units of analysis, and the second describes broader diffusion patterns within country dyads. We begin by describing the most popular terms across the world—measured by the number of countries whose populations searched for a term. Table 3 lists (1) the 50 terms that diffused across the greatest number of countries, (2) the type of term each represents, and (3) the total number of times the term appeared across

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[22] The vast majority of censorship requests come from China and Russia, thus transforming this variable effectively into a dummy for these two countries. Similarly, the market share variable amounts to a dummy for these two countries, since they are the only two where Google is not the first-ranked search engine.

[23] Durbin-Watson tests revealed very minimal evidence of serial autocorrelation ($d = 1.89$, $P < .001$). Unfortunately, we are unaware of any modeling techniques that adjust for both the first-order autoregressive process serial autocorrelation as well as overdispersion. Therefore, we calculated a penalized outcome measure z, as follows: $z = y_{t1} - (\varrho y_{t2})$, where y is the observed outcome, t_1 refers to the observed year, t_2 refers to the previous year, and ϱ, the correlation coefficient assumes a value of .8. This penalized outcome measure produced nearly identical results, available on request.

TABLE 3
GOOGLE SEARCH TERMS THAT APPEARED IN THE LARGEST NUMBER OF COUNTRIES, 2004–14

Search Term	No. of Unique Countries in Which Term Appears	Term Type	Total No. of Country-Month Observations in Which Term Appears
World Cup	193	Sports	2,793
Olympic	150	Sports	1,617
EuroCup	131	Sports	543
iPhone	130	Technology hardware	871
Michael Jackson	112	Music	275
Gangam Style	92	Music	175
Real Madrid	90	Sports	497
Firefox	87	Software	214
Amazon	82	Generic consumer goods	687
Justin Bieber	72	Music	205
Naruto	71	Entertainment	216
Free	71	Other	802
Friv	66	Video games	508
Chrome	64	Technology hardware	135
Champion League	64	Sports	263
Miley Cyrus	64	Music	126
Test	63	Other	490
Barack Obama	62	Contemporary politics	191
Let It Snow	61	Music	110
Wikileaks	60	News	96
Game of Thrones	59	Entertainment	165
Free Game	57	Video games	283
Harlem Shake	56	Entertainment	81
Torrens.md	55	Software	536
Sports	54	Sports	157
Osama Bin Laden	54	Contemporary politics	118
Pope	51	Other	100
Opera	49	Software	159
Waptrick	48	Entertainment	291
Ios 5	47	Technology hardware	87
Lionel Messi	47	Sports	165
Amy Winehouse	46	Music	74
Lady Gaga	46	Music	95
Rihanna	46	Music	113
Nelson Mandela	45	Other	180
Minecraft	44	Video games	83
Score Live	44	Sports	388
Barbie	43	Video games	91
Flappy Bird	43	Video games	72
Hp	43	Technology hardware	69
Swine Flu	42	Other	92
Galaxy	42	Technology hardware	120
Neymar De Silva Santos Junior	42	Sports	71
iPad	41	Government or IGO	154
Prison Break	39	Entertainment	129
Ramadan	37	Generic consumer goods	372
		Video games	105

TABLE 3 (*Continued*)

Search Term	No. of Unique Countries in Which Term Appears	Term Type	Total No. of Country-Month Observations in Which Term Appears
Car Game	37	Video games	92
Dress Up Games. . . .	37	Video games	173
Games for Girls.	37	Technology hardware.	95
S4	36		

NOTE.—Term frequency counts include all linguistic versions of the term identified by the research team.

all country-months, including those that appeared within the same country. This table shows that the FIFA World Cup was the most far-reaching Google search term across the 199 countries and sovereign entities that we studied between 2004 and 2014—reaching all but six countries in our sample and mirroring the massive size of the global TV audience that the soccer tournament attracts. The Olympics and EuroCup follow closely, making sports—and more specifically soccer—the most widely common interest of the world's population. This raises the question whether it makes sense to analyze the temporal sequence in which these terms appear in the top or rising search terms of the various countries as a case of diffusion between such countries: could the search behavior mostly result from simultaneous and shared focus on a global event, rather than the country-to-country diffusion of an interest? We concede that this might very well be the case for these global sports events. These are the exceptions, however, not the rule in the whole universe of cases of diffusion, and the results we report below are very similar if such terms are excluded from the analysis.[24] Furthermore, what counts as a "global" event (the deaths of Osama bin Laden or Michael Jackson, the election of Obama) is itself filtered by the power and prestige of the country producing the event (the United States in these three cases; Western Europe in the case of soccer).

As table 3 shows, there are no truly global fashions, fads, interests, or tastes that predominate the cognitive horizons of everyone around the world—apart from the World Cup. The vast majority of the terms listed in table 3 refer to various forms of entertainment or recreation, particularly music, video games, and film or television. Contemporary politics, by contrast, only appears six times among top diffusion terms, and two of these search terms describe the British royal family, a frequent target of international tabloids.

[24] Recall that the median lag between the subsequent appearances of a term in two countries is 763 days, which is unlikely to result from the simultaneous orientation on a global event.

We remind the reader that table 3 reflects only the most popular search terms. More sophisticated or intellectual topics seldom, or never, reach the top 10 or top 10 rising Google search terms (although we note, in passing, that there was a significant interest in "Max Weber" in Luanda, Angola, in 2005). Recall, however, that the list in table 3 only ranks terms on the basis of the frequency of their appearances across countries. There is significant heterogeneity in the popularity of different types of terms across individual countries. Furthermore, a number of search terms—such as those related to pornography—do not appear in the top 50 terms because, although very popular in some countries, these terms are not searched broadly enough across multiple countries to reach this list.

Frequency of Diffusion across Countries

Table 3 describes the terms that traveled farthest across the world. But how frequent is such diffusion on average among the 19,144 unique terms that made it into the top 10 most popular or top 10 rising searches in any of the 199 countries? Figure 2 represents a histogram that describes how far these terms spread across the countries in our data set. Contrary to widespread assumptions about the ever-increasing scope of cultural globalization or the power of global organizations to dictate the interests of the world citizenry, our data show that few terms that are popular in one country ever appear in another. Of the 19,144 unique terms we analyze, only 2,542 (roughly one in eight) appear in more than one country. Of these, only 220 appear in more than 10 countries, and just 27 terms appear in more than 50 countries. As figure 2 shows, the diffusion of Google search terms thus conforms to a power law distribution that is so heavily skewed that we were forced to break the Y-axis.

Frequency of Imitation across Types of Terms

As noted above, table 3 suggests that certain types of terms—particularly those related to music—are more apt to travel across a wide range of countries. We explore this intuition a bit further here, using a more appropriate data structure. While the descriptive results we have presented thus far were based on terms as units of analysis, we now shift to diffusion within country dyads. Table 4 describes the frequency with which country B in our directed dyadic data set follows country A, using both the "sequential primacy" and "first-rank" measures. The types of terms are ranked according to how frequently imitation occurs as a percentage of all occurrences of terms of this type in all dyad-months.

The results indicate that the domains most intimately connected to national government—such as government itself, education, or news—are
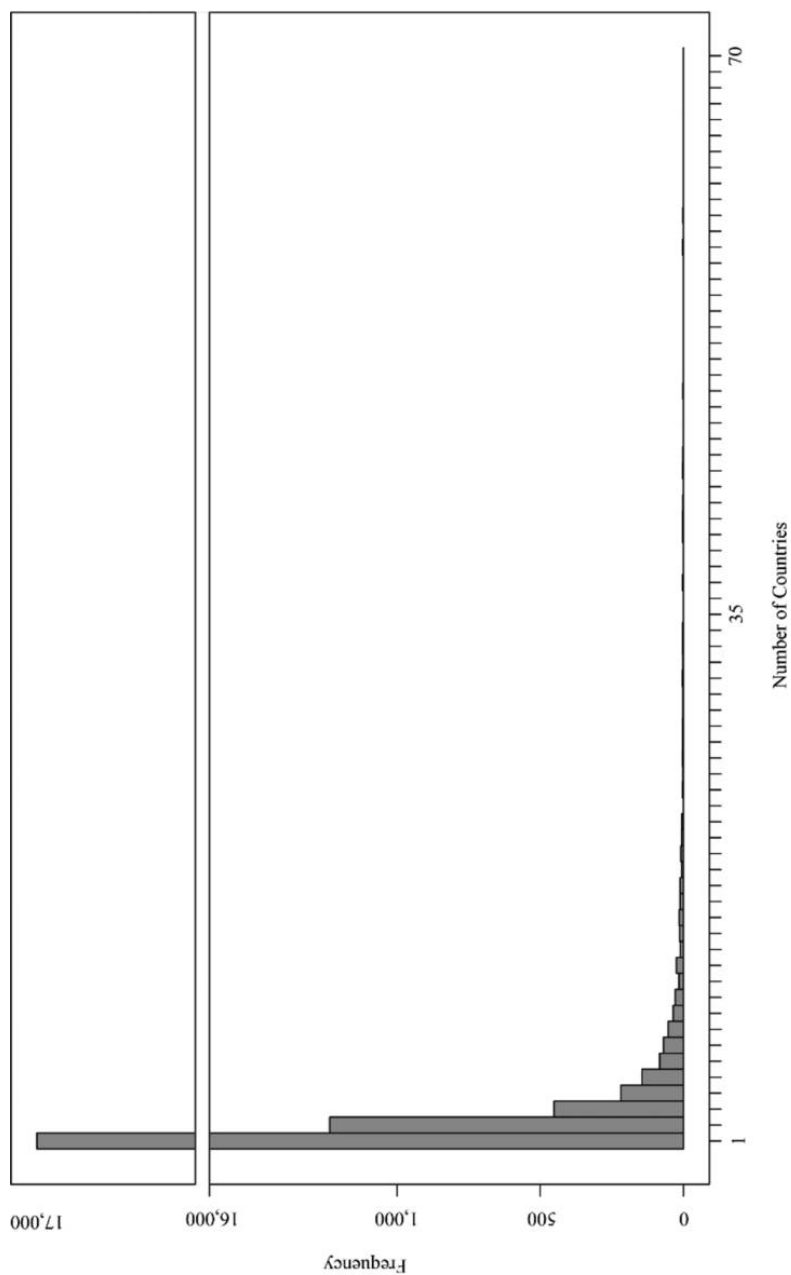
FIG. 2.—Cross-national diffusion of Google search terms

TABLE 4
First-Rank and Sequential Dyadic Diffusion by Type of Term

	FREQUENCY OF TYPE IN ALL COUNTRIES/MONTHS	FIRST-RANK DIFFUSION CASES		SEQUENTIAL PRIMACY DIFFUSION CASES	
TYPE		No.	(%)	No.	(%)
Music.	6,855	1,301	.19	1,373	.20
Cuisine	336	39	.12	44	.13
Software	3,396	382	.11	452	.13
Contemporary politics	3,804	213	.06	218	.06
Entertainment.	17,583	1,706	.10	1,899	.11
Fashion	281	38	.14	37	.13
Sports	12,622	1,019	.08	1,097	.09
Banking	2,330	161	.07	149	.06
Video games	4,780	960	.20	1,011	.21
Travel	2,632	147	.06	144	.05
Consumer goods	6,269	338	.05	336	.05
Technology/hardware.	4,917	523	.11	576	.12
News	13,902	335	.02	324	.02
Education	8,559	135	.02	137	.02
Government	5,971	133	.02	132	.02
Geography	22,412	404	.02	380	.02

among the least likely to diffuse. Conversely, diffusion occurs more frequently within domains less regulated by national governments, such as music, software, entertainment, fashion, sports, and cuisine (although the absolute number of search terms related to cuisine is very small indeed). Search terms associated with contemporary politics, however, also diffuse at a relatively high rate. But the overall pattern still holds: government-regulated or government-influenced domains are less prone to diffusion. This lends credence to our earlier conjecture that cultural tastes, consumption preferences, and other individual interests might diffuse more than objects tightly linked to government decision making, which are the focal point of the institutionalist research tradition. That is, the political boundaries created by nation-states appear to be the most powerful roadblocks to the cross-national diffusion of consumer preferences and cultural tastes around the world.

Pathways of Diffusion

Next, we describe the pathways through which diffusion occurs—or more precisely, the countries across which terms "travel" over time. As table 5 shows, remarkably few of these pathways are repeated by more than one search term. The overwhelming majority of diffusion sequences—according to both of our measures—involves only two or three countries. We observed only 115 country dyads that were relevant for more than three terms. In other words, global diffusion follows a rhizoid, multichannel pattern.

TABLE 5
FREQUENCY OF DYADIC DIFFUSION: NUMBER OF CASES

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sequential																
primacy count	336,057	6,448	800	253	100	40	16	11	4	3	3	2	0	2	0	1
First-rank count	336,808	5,848	715	207	91	36	13	9	3	3	2	2	0	2	0	0

Each term that travels, to return to our earlier metaphor, does so on its own country road, rather than joining many others on a global highway.

The multichanneled, rhizoid nature of global diffusion flows can also be visualized in the form of a Sankey diagram (see fig. 3). Each rectangle describes a country, and the vertical size of the bar depicts the number of times Google search terms appear first in that country and subsequently in any other country. The size of each bar thus describes the overall influence of a country's population in the global spread of cultural interests and consumer tastes. The arcs between countries represent pathways of diffusion, and the width of these arcs corresponds to the number of terms that "traveled" down a particular, dyadic pathway across the entire study period (2004–14). Because of space constraints, we only visualize a pathway if it was taken by at least two terms during the study period, thus limiting ourselves, for the sake of illustration, to roughly 25% of all diffusion cases.[25] Countries are arranged along the *X*-axis according to the ratio of how many times the search behavior spread to another country—compared to how many times a country's population searched after that of another country. Thus, individuals in countries on the left side of the diagram influence the search behavior of the individuals of many other countries, but they are seldom influenced by others. Countries are arranged along the *Y*-axis according to an optimal modularity algorithm. In other words, diffusion between individuals in countries that are close to one another on the *Y*-axis is common.

Once again, this figure shows that pathways of global diffusion are highly complex. It reveals a multiplicity of channels, the overwhelming majority of them used by only two search terms. If we combine this insight with those from the histogram presented in figure 2, we realize that diffusion is rare and that it occurs through a variegated, differentiated network of short connections between countries. The classic "sender-receiver" metaphor on which the literature on policy diffusion relies therefore appears inappropriate for the kind of phenomenon at hand. Rather than a single sender (the country that invented a new institution or policy) and a multiplicity of receivers who adopt the innovation faster or slower, we see a multiplicity of senders with only very few receivers—a perspective that can only emerge if we

[25] As a result 3,283 edges between countries within our data set are not represented within fig. 3.
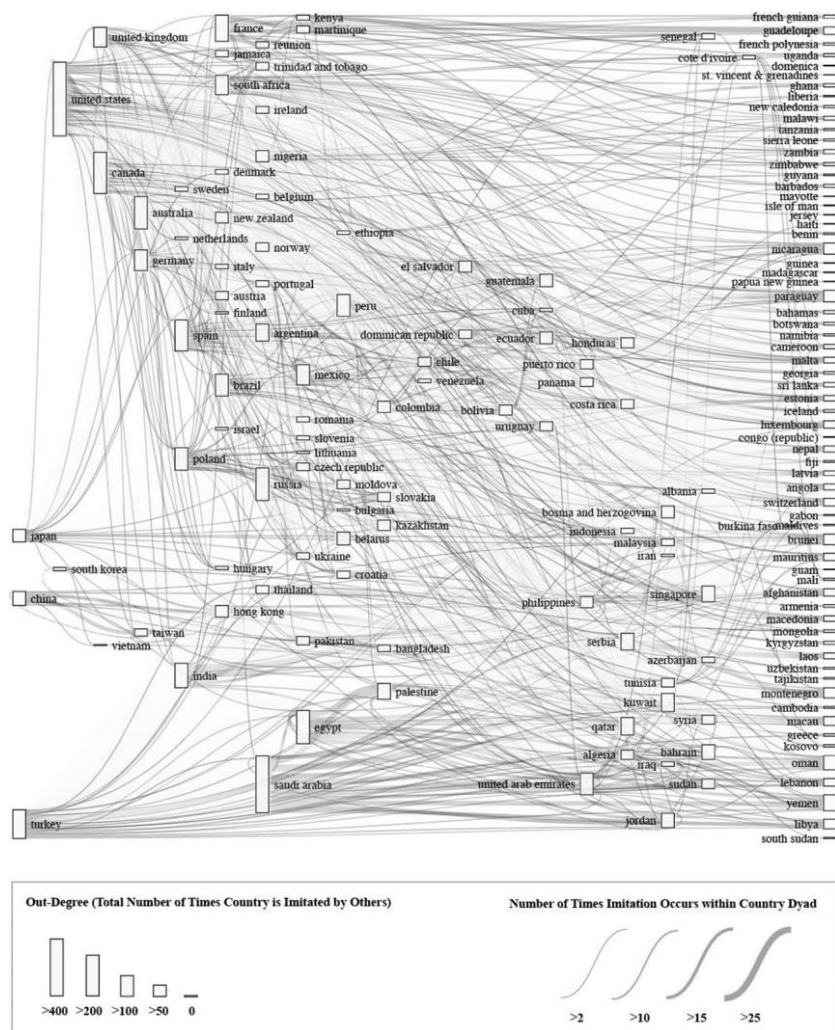
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Fig. 3.—Diffusion pathways across 199 countries, 2004–14. Countries are arranged in multidimensional space according to an optimal modularity algorithm. Only country dyads where diffusion occurs at least two times are pictured.

avoid sampling on the dependent variable, as would be the case if we were to focus on spectacular cases of widespread diffusion alone (such as "Gangnam Style" or the iPhone).

Relatedly, global diffusion processes are not led by a single global hegemon, as some early globalization theorists assumed. This is further illustrated by some simple descriptive statistics. Seventy-four countries were never influ-

1530

enced by the United States, and 94 countries were influenced by the United States less than five times over the 10-year period. What is more, of the 2,542 terms that diffuse across more than one country, only 136 (3%) originate in the United States. Instead of a single global hegemon, there are multiple centers from which diffused terms originate—including the United States, Japan, China, Turkey, and Saudi Arabia. Further analysis, using clustering techniques appropriate to identify tightly connected "communities," shows that these regional powers do not dominate clearly delineated spheres of influence either.[26] These various analyses lead us to the conclusion that global diffusion pathways are mainly dyadic—involving only two or occasionally three countries—and polystenopoid (from the Greek *stenōpós* for "pathway").

The arrangement of countries along the *Y*-axis of figure 3 also suggests that geographic, linguistic, and historical commonalities influence diffusion processes. For example, the upper-left portion of figure 3 includes mostly Anglophone countries that were former British colonies such as the United States, Canada, and Australia. The upper-right section of figure 3 contains a postcolonial cluster with France and many of its former colonies such as Senegal and the Ivory Coast. Linguistic commonality also seems to pattern diffusion processes. For example, countries where Arabic is among the most widely spoken languages are grouped in the lower-right side of figure 3. There are also groups where geographic proximity seems to influence diffusion patterns—such as the region of figure 3 that includes Japan, China, and South Korea. Similarly, India, Pakistan, and Bangladesh are grouped near one another in the bottom left of the graph.

Are global diffusion patterns therefore mainly influenced by cultural boundaries and proximity? Is there any role for the prestige and power mechanism—the most important and original element in the Tardean theory of imitation in shaping the global diffusion network that we have described in this section? To answer this question, we now turn to multivariate analyses. This allows us to consider not only cases of diffusion—as in figure 3—but the entire universe of search terms, including the 17,893 search terms that never appeared in more than one country.

MULTIVARIATE RESULTS

Negative Binomial Regression Models

Figure 4 describes the results of negative binomial regression models that predict the yearly frequency of diffusion within a country dyad for each

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[26] We identified clusters of countries using the Girvan-Newman community detection method. Yet the sparseness of dyadic influence created unintelligible results. Among the 18 modularity classes identified, there was one class that included 177 of the 199 countries in the sample.
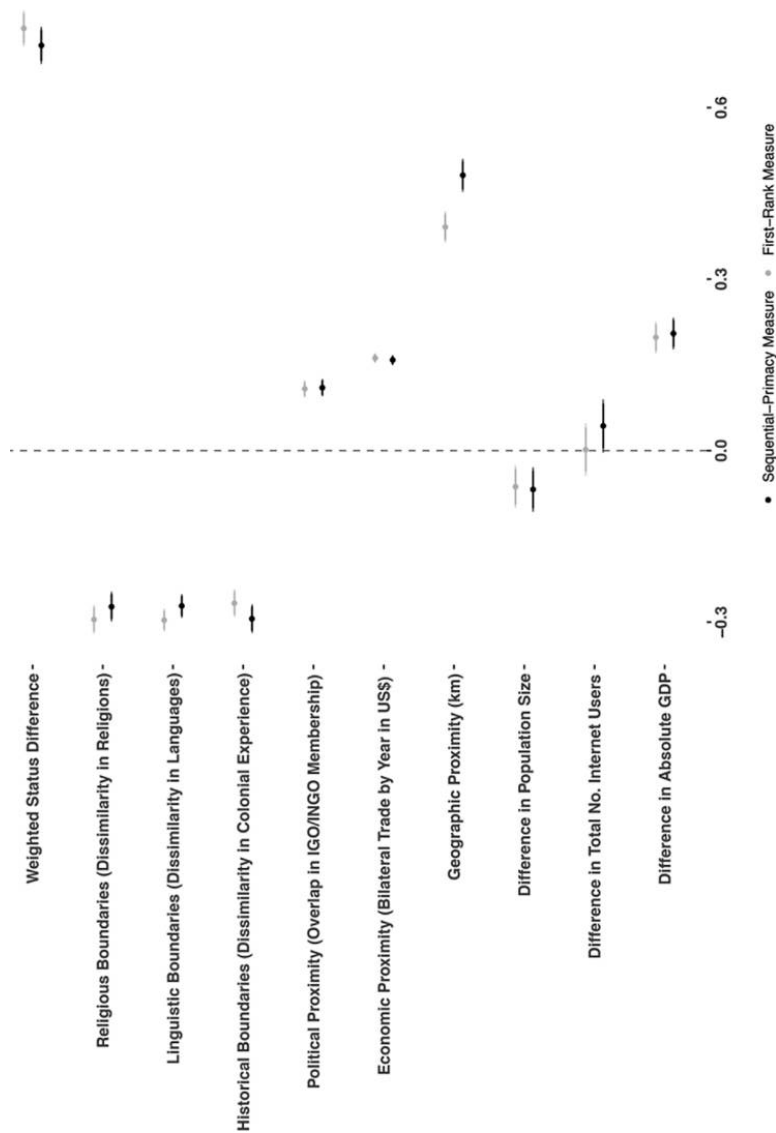
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FIG. 4.—Negative binomial regression models predicting diffusion within country dyads: $N = 346,620$ country-dyad-year observations (2004–14). For definitions of the two measures, see main text. *Circles*, regression coefficients; *lines*, 99% and 95% confidence intervals. Yearly fixed-effects coefficients not pictured.

of the two dependent variables. The results in black describe the sequential primacy count model, which measures the number of times a country's search terms later appeared in any other country. The results in gray describe the first-rank count model. This outcome also measures the number of times a country's terms appeared in other countries, but it does so only for the country where the term appeared first.

Because of the large size of our sample, we focus on the size of the relationships between predictors and outcomes rather than on their *P*-values. As figure 4 shows, the effect of the core independent variable—the weighted power and prestige score of country A minus the rank of country B—is consistently the strongest predictor of diffusion across both models. In everyday language, this means that populations in lower-status countries adopt search terms after they have already become popular among populations in countries that rank higher in the international hierarchy of power and prestige. Transforming these regression coefficients into incidence rate ratios, we find that a 1 standard deviation increase in weighted power/prestige difference is associated with a 2.06–2.12 increase in the number of times country A searches for a term before country B. These findings provide strong support for a Tardean interpretation of global diffusion as a case of imitation, motived by the desire to appropriate the cultural interests and consumer tastes of more prestigious and powerful actors.

It is reassuring to find such a strong effect for the weighted power/prestige difference measure, even when controlling, as we do, for absolute differences in GDP (indicating differences in the innovation capacity and possibly also the influence of powerful organizations), population and Internet population sizes (related to the probability of "inventing" a new search term), and other factors. Cross-national power and prestige differentials, these models suggest, are associated with diffusion not because the higher-ranked countries are richer or more populous but because of the more specific imitation mechanism according to which individuals adopt the interests and behaviors of those they perceive as more prestigious or powerful.

We also find considerable support for the second hypothesis described above, as all measures of social proximity have positive associations with diffusion. Political proximity, measured as the similarity of memberships in intergovernmental organizations and international nongovernmental organizations, has a small positive association with the outcome for the sequential rank and first-rank imitation measures. Economic proximity, as measured through the volume of bilateral trade, shows a modest positive association with both outcomes, as does geographic proximity.

We also find support for the third hypothesis: that cultural boundaries have strong negative associations with the outcome. Across the two models, religious boundaries have a strong negative association with diffusion. That is, the greater the difference in the religious makeup of any two countries,

1533

American Journal of Sociology

the less likely they are to imitate one another. This also holds for linguistic boundaries and dissimilarity in colonial experience. Countries that were colonies of Spain, for example, often imitate one another, as the Sankey diagram (fig. 3) already suggested. They are also less prone to adopt search terms that emerged in an English-speaking country.

Finally, most of the control variables in our models show effects that are either very small or inconsistently significant. Difference in population size, for example, has a small negative association with the outcome—although this finding is only barely statistically significant. The measure of GDP differences, however, has a sizable association with the dependent variables, in line with our expectations: richer countries are more likely to produce innovations that subsequently spread to the rest of the world.[27]

Exploring Channels of Diffusion: Interpersonal Influence
and Organizational Broadcasting

Having established baseline results that are consistent with our theoretical expectations, we now turn to one of the most important confounding mechanisms we discussed above: that organizations such as multinational corporations or international associations shape the set of objects in which individuals can become interested, by marketing their products or events all over the world. Indeed, many search terms that diffused widely across countries refer to brands or even specific products—such as the name of a video game, a consumer product (e.g., the iPhone), or sports tournaments such as the World Cup. Cross-national interest in these products or events might be shaped by what diffusion researchers have called broadcasting effects (e.g., Strang and Soule 1998, p. 270), rather then by imitation proper.[28] Broadcasting is sometimes limited to certain countries or regions, thus again shaping the set of objects from which individuals choose. For example, certain sports events (such as the world cricket tournament) are only marketed in countries with a sizable number of fans of that sport. The fact that Colombians rarely search for cricket, therefore, should perhaps not be attributed to their lack of recognition of the United Kingdom as a prestigious country but to the fact that cricket cannot be viewed on Colombian TV.

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[27] Supplementary analyses, not pictured in fig. 4, indicate that the combined censorship requests made to Google for each country dyad—as well as the market share of Google in each country—have very small associations with the outcome that do not substantively alter the main associations reported above.

[28] For evidence of how broadcasting or "exposure" effects trump interpersonal imitation processes in the case of suicide, see Hoffman and Bearman (2016). For an overview of broadcasting effects in diffusion processes more broadly, see Van den Bulte and Lilien (2001).

1534

Powerful organizations may not only shape the choice set of individuals around the world in this way but also determine the sequence in which the products or events appear in Internet searches across the world. Apple, for example, may launch an advertising campaign for a new iPhone in the United States and then in Western Europe and East Asia, before publicizing it in rest of the world. The fact that "the rest of the world" searches for the new iPhone later on might therefore be the consequence of a sequenced broadcasting process, rather than imitation proper.

But—in line with a Tardean view of imitation—interests in certain products or events might spread through personal relationships between individuals living in different countries. These relationships might be established through personal contacts (e.g., at an international convention), through previous migration, or through family connections. Imitation through such personal contacts has become more likely in the age of social media, where cross-national boundaries no longer determine the possibility of long-distance interaction between individuals as much as they once did. Social media thus represent another, more microlevel social proximity mechanism in line with the Tardean theoretical framework outlined above.

In this section, we analyze the possible role of both broadcasting and interpersonal contacts as channels of diffusion. First, we explore whether terms that are promoted by organizations diffuse faster across a wider range of countries than terms without such institutional support. Previous studies indicate that the promotion of a product, behavior, or idea by powerful organizations follows a negative exponential or R-shaped curve, which results from coordinated broadcasting across a number of different social settings within a short time period (Van den Bulte and Lilien 2001; Rossman 2015). In contrast, we expect that terms not broadcast by organizations will follow the classical S-shaped diffusion curve, indicating that the process was mainly driven by incremental influence between individuals.

We analyzed the shape of diffusion curves for the 216 search terms that diffused to more than 10 countries—as such analysis is not very meaningful for terms that spread to only a handful of countries. We hand coded each term via extensive Internet research to determine whether it benefited from institutional promotion.[29] Of the 216 terms that diffused to more than 10 countries, 20 were not suited for this analysis because the time resolution of our

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[29] We used the following coding rules to define terms that received institutional support: (1) terms that refer to a consumer item (including movies, music albums, games, etc.) and events, or the associated name of a person, that were distributed/released sequentially across different countries by a globally operating organization (this could affect our measurement of dyadic imitation, i.e., which population imitates which other population in cases in which both searched for the same term); (2) consumer items or events (including TV shows, sports tournaments, etc.) that cannot be accessed in all countries of the world because an organization limits the promotion of these items or events to a group of countries or a region (this could affect our measurement of dyadic imitation since it influences

1535

data did not allow us to determine the shape of the diffusion curve. Of the remaining terms, 89 were sequentially promoted by an institution.

We then employed Rossman, Chiu, and Mol's (2008) multilevel diffusion curve modeling (MDC) technique to determine whether the diffusion curves of terms that organizations promoted follow broadcasting or bottom-up, decentralized, patterns.[30] Results (see fig. A2) show that the diffusion of organizationally promoted terms does not resemble a prototypical R-shaped curve, nor do nonpromoted terms diffuse in an S-shaped form.[31] Rather, both curves exhibit a similar, nearly linear shape. Terms without promotion by organizations tend to spread even more rapidly than those that receive institutional support. Given the relatively small number of terms on which this analysis is based—and given that the temporal structure of diffusion processes is not our main concern in this article—we refrain from further interpretation.

Second, we extended the coding of organizational promotion to all terms that had diffused to more than one country. Importantly, only 639 of these 2,333 terms were organizationally promoted, whereas the vast majority (1,836) was not. But the average number of countries to which a term diffused was slightly larger for terms that were organizationally promoted (7.4) compared to those that were not (5.2). The two facts combined indicate that the horizon of possible interests from which individuals choose—the content of the choice set—is certainly influenced by powerful cross-national organizations, but it is not entirely determined by it.

Third, we explored whether the pattern of diffusion between country dyads—which populations are imitating which other populations' search behavior—is influenced by country differences in organizational capacity to broadcast products or events. We created a measure of organizational capacity by subtracting the number of organizationally promoted terms that appeared first in country B from those that first appeared in country A. Returning to the analysis of country dyads also provided us with the opportunity to test whether direct person-to-person contacts matter for cross-

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which terms appear in the choice set of which populations); and (3) any individual whose travels/tours are widely reported about in news media (but not famous individuals who do not travel, such as Osama Bin Laden, or are deceased, such as Joan Miro; this again could influence the sequence in which terms appear across countries because it may be determined by the itinerary of these individuals).

[30] We thank an *AJS* reviewer for this suggestion. We dropped an additional 13 terms in order to perform this analysis because their diffusion curves were not negative exponential or binomial, which is necessary to perform MDC.

[31] Following Rossman et al. (2008), we first fit a regression curve for each search term and then employ the coefficients of those regressions as a new data set, from which one can derive predicted diffusion curves associated with a covariate such as institutional support. Figure A2 presents predicted diffusion curves for terms that did and did not receive institutional support from the MDC analysis.

1536

national diffusion, as Tarde would expect. We use the aforementioned data on the prevalence of Facebook friendships between individual country pairs in 2012 (Deutschmann 2016). Note that this is but one channel of person-to-person influence, which could also occur through phone calls, personal travel, e-mail, and so on, none of which are measured here.

Figure 5 shows that both channels of diffusion contribute to our understanding of which populations imitate which other populations. The size of the coefficients for Facebook ties and for differences in organizational power are roughly equivalent in both versions of the model. Global institutional power does influence the set from which individuals choose their interests, as well as the sequence in which populations imitate one another, but so do personal ties through which information flows without any systematic interference of global institutions.

Perhaps most importantly, the weighted power and prestige difference between countries remains the strongest predictor of dyadic influence and is virtually unchanged in figure 5 compared to figure 4. While cross-national diffusion is certainly influenced by organized interests—from globally operating companies to international sports organizations—the three analyses we presented in this section suggest they do so in limited ways. We first showed that organizational promotion does not lead to a more rapid process of diffusion. Second, while such promotion helps terms to spread a bit more widely across countries, the vast majority of terms with a wide geographic reach were not promoted by organizations (step 2). Third, the organizational capacity of different countries to promote terms does indeed influence which populations adopt the interests of which other populations, but so do personal ties that are maintained by Facebook friendships. Quite obviously, these conclusions are tentative, and future studies are needed to further investigate the role of global broadcasting effects.[32]

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[32] Another possible confounding mechanism—apart from institutional broadcasting—is that it is easier to produce attractive products (let us say the performance of Lady Gaga) in rich and populous countries such as the United States, which host an abundance of stylists, choreographers, composers, stage directors, etc., compared to a small and poor country such as Bhutan. Note, however, that all of the above models control for GDP differences and differences in population size that should capture a large part of these differences in the production capabilities between the United States and Bhutan. One could also question, however, why rich and populous countries should produce products that appeal to the populations of small and poor countries—if not for the prestige and power effect that we focus on. It is plausible to assume that there is an intrinsic value for individuals to hear songs in their own language (Bhutanese rather than English), by women dressed in local attire and in local styles (rather than what must appear as the rather indecent and extravagant appearance of Lady Gaga), and in sync with local musical traditions (e.g., those derived from Drupka Buddhist folk traditions in the case of Bhutan). It is therefore far from clear why Bhutanese should find Lady Gaga interesting, even if her performance is highly professional and polished, if it were not for the power and prestige of things American.
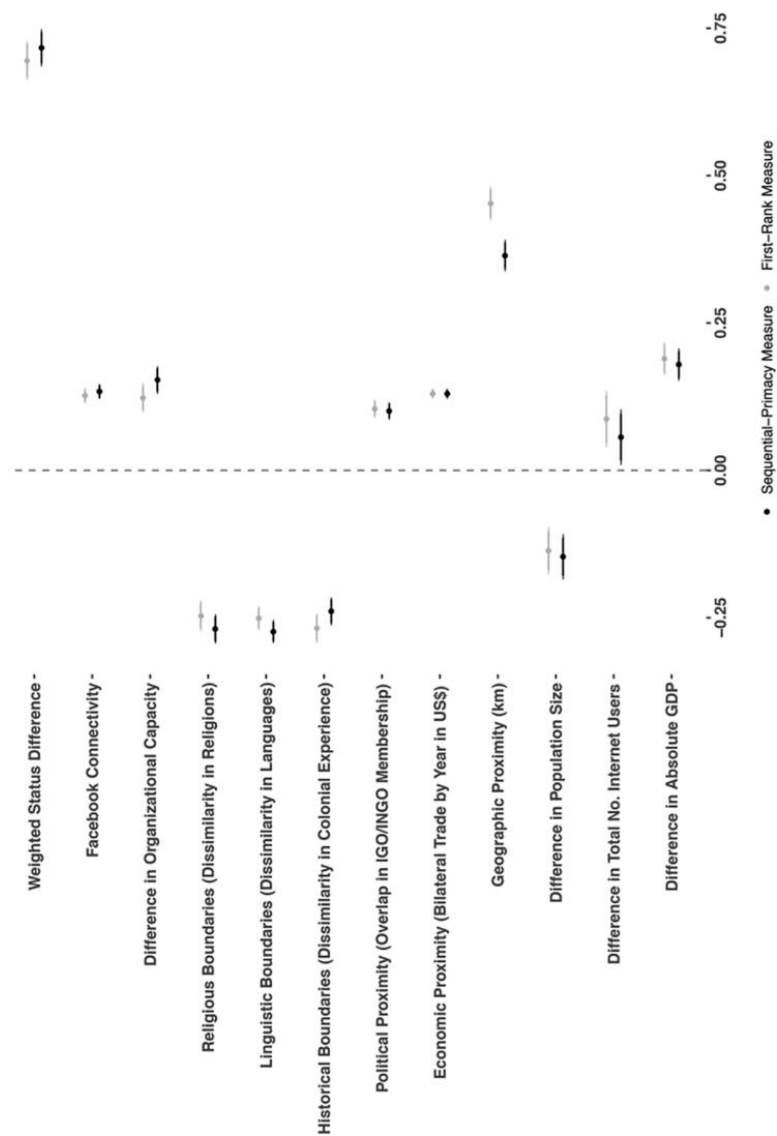
Fig. 5.—Negative binomial regression models predicting diffusion with additional controls for institutional support and individual social media ties: $N = 346{,}620$ country-dyad-year observations (2004–14). For definitions of the two measures, see main text. *Circles*, regression coefficients; *lines*, 99% and 95% confidence intervals. Yearly fixed-effects coefficients not pictured.

DISCUSSION AND CONCLUSION

To our knowledge, this is the first study to examine the diffusion of cultural tastes, consumption preferences, and individual interests across the globe and over time. We thus provide a complement to the large literature on the cross-national diffusion of institutions and public policies. We also contribute a data set that comprises the entire universe of cultural tastes, consumption preferences, and other individual interests on the world's largest website, including those that never cross geopolitical boundaries, thus avoiding the problem of sampling on the dependent variable that characterizes so much previous research. Contrary to some early programmatic statements about cultural homogenization in a globally connected world, we found that the global diffusion of cultural tastes and consumption preferences is surprisingly rare and that it proceeds along complex pathways connecting individual country dyads instead of a single global chain tying the global peripheries to an American cultural hegemon. Finally, we introduced a theoretical framework that may be more appropriate to explain the mechanisms generating these complex patterns characterizing the diffusion of individual-level cultural tastes, consumption preferences, and other interests.

Before discussing the implications of our findings, we first note several potential limitations, some of which could be addressed by future research. First, the empirical evidence for the operation of an imitation mechanism is less direct than we might like. Future studies could trace the actual process of imitation across individual users of social media sites, for example, or via experimental methods in controlled online environments (e.g., Salganik, Dodds, and Watts 2006). Such data would help determine whether sequential order is indeed driven mostly by imitation—that Germans became interested in Frau Gaga, for example, because the more powerful and prestigious American consumers have already become interested in Lady Gaga's music. Such individual-level data would also reveal whether perceived prestige difference is indeed the driving force—thus avoiding confounding prestige with productivity, as our measurement of the main independent variable may do.

Second—and relatedly—the fact that our data are aggregated at the country level risks introducing considerable measurement error. In an ideal world, we would of course observe individual-level search behavior with a global sample of Internet users. Such an analysis could determine whether cultural tastes, consumption preferences, and information searches indeed cluster at the country level rather than some other socially meaningful units such as social classes, regions, cities, or neighborhoods (e.g., Alderson and Beckfield 2004; Harding 2007; Maxwell 2013). The fact that so many search terms are unique to specific countries, however, gives us confidence that we would observe significant country-level clustering, even if it were possible to

1539

collect individual-level data. Once again, future studies might use social media data to examine the cross-national spread of cultural tastes, consumption preferences, and information searches across individuals. To date, however, social scientists rarely obtain access to the individual-level data contained in these data sets.

Third, as discussed above, we create additional measurement error by focusing on only the top 10 most popular and top 10 increasingly popular search terms to establish sequential ordering between countries. It may be that individuals in one country started to search for a term—but at a rather low volume—before individuals in another country did where the term subsequently broke into the list of top 10 terms. As we discussed above, a more comprehensive examination of this issue would require analysis of the entire population of search terms in our data set in every single country. Unfortunately, this would represent a massive undertaking because it would require research assistants to visit more than 4 million country-specific links.

Fourth, translating the massive corpus of search terms, identifying identical terms, and assigning terms to types (such as music or sports) in 73 different languages produces an unavoidable level of error. We note, however, that our approach goes beyond standard practice in the field of computational social science where such text-based data are typically taken at face value and processed in raw form without much coding by humans. In contrast, our research assistants searched for each of the raw terms we collected in their original language using country-specific Google sites. These searches confirmed that the automated techniques we used (e.g., Google Translate) produced meaningful results and that the search terms were unique, rather than variations of the same term. We believe that such a combination of automated and hand-coding techniques could serve as a model for future large-scale studies of Internet-based data from Google or social media sites such as Facebook and Twitter.

We conclude by noting some implications for future research on global diffusion. First, with regard to the literature on cultural globalization within sociology and anthropology, our study clearly contradicts the idea that a homogenized world of cultural interest and consumer tastes has emerged (as some authors in the eighties and nineties maintained). The overwhelming majority of the objects of curiosity of the world's population are country specific. While our data suggest that others often imitate the search behavior of Americans and that some of the most widely diffused terms do originate in the United States, such widespread diffusion across many regions of the world is very rare. Equally important, we did not observe a preponderance of one-to-many global diffusion chains originating in the United States. Instead, we found more complex, rhizoid pathways that involve a range of dyadic relationships within regions, sometimes led by regional powers such as Turkey, India, China, Japan, or Saudi Arabia. These findings

1540

mirror Beckfield's (2010) study of the fragmentation of the world polity into regional blocks, as measured by memberships in intergovernmental organizations. In the case of Google searches, however, even such regional clustering appears to be much weaker.

Second, our findings have implications for the institutionalist paradigm of global diffusion research within sociology and political science. More specifically, our analyses indicate how important it is to consider the entire population of objects that might diffuse instead of the rare cases that diffuse across a large number of countries. If the globalization of cultural tastes and consumption preferences (as measured imperfectly through Google search terms) is rare, it may very well be that the diffusion of political institutions and policies is even more rare—a speculation that only a parallel data collection effort in the domain of political institutions and policies could substantiate.

Relatedly, only a complete analysis of all instances of diffusion allowed us to see that the vast majority of them proceed through very short chains connecting only two countries and that these short pathways are rarely traveled by more than one search term. A similar analysis in the domain of innovations, institutions, and policies would perhaps produce a similar picture of a rhizoid, multicentered landscape of diffusion, rather than the familiar image of a single sender and multiple receivers that underlies most existing research on diffusion.

APPENDIX

In the main text of this manuscript, we employ diffusion measures that are time invariant. Thus, a search term that appeared in France in 2004 could hypothetically appear in Finland in 2014 and count as dyadic influence in our model. Because the precise mechanisms of diffusion would be difficult to identify in such cases, we conducted additional analyses using a one-year cutoff point for dyadic diffusion for each of our two outcomes, the first-rank measurement and the sequential primacy measurement. Figure A1 describes the results of this analysis, showing that our key indicator remains strongly and significantly associated with both of these outcomes created using a one-year cutoff.
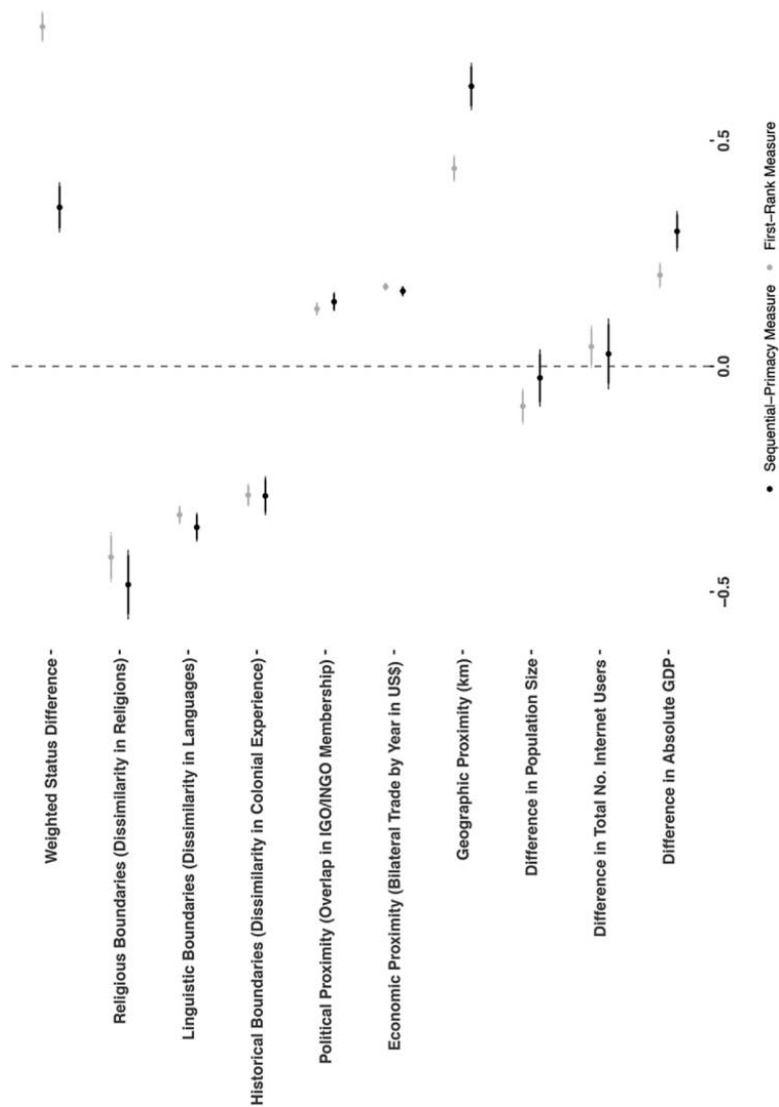
1541

Fig. A1.—Negative binomial regression models predicting diffusion between country dyads using one-year cutoff: $N = 346,620$ country-dyad-year observations (2004–14). For definitions of the two measures, see main text. *Circles*, regression coefficients; *lines*, 99% and 95% confidence intervals. Yearly fixed-effects coefficients not pictured.
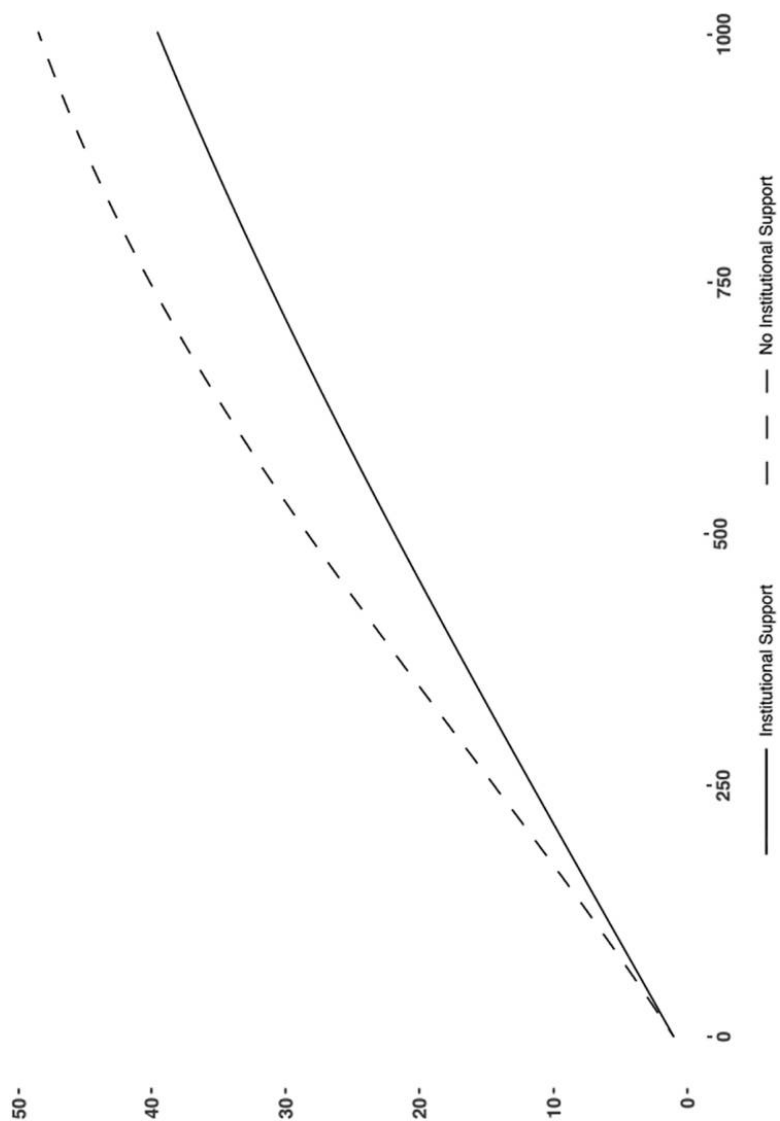
FIG. A2.—Predicted diffusion curves of Google search terms that appear in more than 10 countries by existence of institutional support.

1543

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