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RESEARCH SYNTHESIS
PUBLIC OPINION AND THE CLASSICAL TRADITION: REDUX IN THE DIGITAL AGE

DEBORAH LYNN GUBER*

Abstract Digital trace data have the potential to offer rich insight into complex behaviors that were once out of reach, but their use has raised vital and unresolved questions about what is—or is not—public opinion. Building on the work of James Bryce, Lindsay Rogers, Herbert Blumer, Paul Lazarsfeld, and more, this essay revisits the discipline's historical roots and draws parallels between past theory and present practice. Today, scholars treat public opinion as the summation of individual attitudes, weighted equally and expressed anonymously at static points in time through polls, yet prior to the advent of survey research, it was conceived as something intrinsically social and dynamic. In an era dominated by online discussion boards and social media platforms, the insights of this earlier "classical tradition" offer two pathways forward. First, for those who criticize computational social science as poorly theorized, it provides a strong justification for the work that data scientists do in text mining and sentiment analysis. And second, it offers clues for how emerging technologies might be leveraged effectively for the study of public opinion in the future.

DEBORAH LYNN GUBER is an associate professor in the Department of Political Science at the University of Vermont in Burlington, VT, USA. The author wishes to thank the anonymous reviewers for their many insightful comments and suggestions. *Address correspondence to Deborah Lynn Guber, University of Vermont, Old Mill, Room 532, 94 University Place, Burlington, VT 05405-0114, USA; email: Deborah.Guber@uvm.edu.

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> The obvious weakness of government by opinion is the difficulty of ascertaining it... The mechanical difficulties, as one may call them, of working such a method of government are obvious. How is the will of the majority to be ascertained except by counting votes? How, without greatest inconvenience, can votes be frequently taken on all the chief questions that arise? No country has yet surmounted these inconveniences....
>
> —James Bryce (1889)

> Digital democracy is here. We no longer passively watch our leaders on television and register our opinions on Election Day. Modern politics happens when somebody comments on Twitter or links to a campaign through Facebook. In our hyper-networked world, anyone can say anything, and it can be read by millions.
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> —Fabio Rojas (2013)

In the summer of 1870, a young Oxford law professor and aspiring historian named James Bryce sailed with a friend from Liverpool en route to New York. His first book, adapted from a prize essay in college titled *The Holy Roman Empire* (1864), had enjoyed modest success in academic circles, but not enough to explain the confidence and ambition with which he set to work on his next project. Positioning himself more or less within "the apostolic succession of students of American democracy" (Wilson 1939, p. 422), Bryce was determined to follow in the footsteps of Alexis de Tocqueville, Gustave de Baumont, and other European intellectuals eager for a glimpse of the United States, and would in the course of his travels, read, discuss, and observe with a "Victorian curiosity for everything" (Lefcowitz, Lefcowitz, and Bryce 1977, p. 315).

From that first visit, Bryce took "the usual swarm of bold generalizations," as he put it. Half of those were "thrown overboard" after a second tour in 1881, and more were "dropped into the Atlantic" following a third trip two years later (Bryce 1888, p. 4). What remained from his conversations in the halls of Congress, at dinner parties, on the decks of steamers, in smoking cars, and in wagons on the Western prairie became a vast and carefully crafted book, published in two volumes, titled *The American Commonwealth*.

While it is possible to read Bryce's magnum opus as merely a quaint account of late nineteenth-century American politics and government—albeit one penned by "an exceptionally urbane, well-informed, sharp-eyed visitor" who would go on to become a prominent member of Parliament, a British ambassador to the United States, and a viscount—a lengthy section in the second volume of that book, simply titled "Public Opinion," has conferred a rather more unexpected legacy on Bryce (Keller 1988, p. 89). His writing on the subject would inspire later generations of scholars to embrace him as the "patron saint" of the modern polling profession (Lazarsfeld 1950, p. 627).

Indeed, he would become the "patron muse" of the industry's most prominent pioneer, George Gallup, who "never tired" of quoting his idol (Cantril 1984, p. 807; Igo 2006, p. 112). As one historian gushed when re-evaluating Bryce's work in 1958: "It is doubtful whether the net result of the enormous mass of man hours and money which have been poured into public opinion research really amounts to much more than dotting the i's and crossing the t's of what Bryce had to say" (Nicholas 1958, p. 6).

"Of all the experiments which America has made," he believed that public opinion was the subject that "best deserves study" (Bryce 1889, p. 225). Bryce thought the United States had demonstrated more boldness in trusting the sovereign masses than anywhere else on earth. Public opinion stood out to him as "the great source of power" and "the master of servants who tremble before it," yet its rich contours were difficult to capture (Bryce 1889, p. 225). In his view, the central defect of democratic government was not the thing itself; it was "the want of appropriate machinery" that rendered America incapable of attaining its ideal. "The obvious weakness of government by opinion," he said, "is the difficulty of ascertaining it" (Bryce 1889, p. 315). If such "mechanical difficulties" could be overcome, if there could be some "means whereby the national will should be quickly known"—perhaps even "ascertainable at all times, and without the need of its passing through a body of representatives, possibly even without the need of voting machinery at all"—then public opinion would have entered the fourth and final stage in its evolution from an unconscious and acquiescent state into a "conscious and active condition" (Bryce 1889, p. 220). It would not just reign but govern. Of course, he hastened to add: "No country has yet surmounted these inconveniences" (Bryce 1889, p. 221).

James Bryce could never have imagined Twitter.

Tweets Are the New Vox Populi
Is Public Opinion Polling Obsolete in a Big Data World?
Survey Research Can't Capture Everyone's Opinion—but Twitter Can

Today, newspapers are replete with headlines like these that tout the use of emerging technologies to capture public opinion (Hilyard, Broniatowski, and Dredze 2015; Sullivan and Ott 2015; Tworek 2018). The creation of social media in particular, and the traces of activity it leaves behind as users interact with digital services, have made it possible to archive data streams of unprecedented size and variety, mainly in the form of unstructured text, "scraped" or "mined" from websites and apps (Beyer and Laney 2012; Jungherr et al. 2017). At a time when conventional polls face rising costs and the challenges of sinking response rates, the allure of new and improved machinery—to borrow Bryce's use of the word—is understandable (Goidel and Cook 2011; Schoeni et al. 2013). With embarrassing mispredictions in the UK during its referendum to leave the European Union in 2016, as well as the industry's

underestimation of Donald Trump in the two most recent US presidential elections, many in the field have openly wondered whether surveys can still produce valid data, and if so, for how long (Keeter 2018; Zhang and Weaver 2020). As Cliff Zukin, former president of the American Association for Public Opinion Research (AAPOR), worries, "our operating model, or paradigm, is breaking down" (Fitzgerald 2008, p. 60; Zukin 2015).

If data science is the next frontier, then a "relatively simple sentiment detector based on Twitter data," as some computer scientists describe it, might one day replace industry-standard polls on subjects such as consumer confidence and presidential job approval (O'Connor et al. 2010). Questionnaires administered to a random sample of adults might give way to methods that harvest text from users' online behavior and extract its sentiment through natural language processing, or even through far more simple acts, such as clicking a Like button, retweeting a post, or following a hashtag (Grimmer and Stewart 2013; Anstead and O'Loughlin 2014; Liu 2015; Resnyansky 2019). If and when that happens, it will be a disruptive event on a scale with the transition from straw to scientific polls in the 1930s, which makes a comment by Harwood Childs at the time especially prophetic. In 1939, as founder and first editor of *Public Opinion Quarterly*, he said that modern developments in technology lacked meaning when they were not connected to "precisely defined concepts." In the excitability of the moment, it was desirable, he thought, "to pause from time to time and essay this task of reorientation" (Childs 1939, p. 327). This is an effort to do just that.

In the spirit of Paul Lazarsfeld, who authored a memorable essay titled "Public Opinion and the Classical Tradition" in 1957, and Elisabeth Noelle-Neumann, who followed with her own re-evaluation of the same in 1979, this article revisits the discipline's historical roots and finds that there is still much to gain in reading the work of early scholars such as James Bryce, A. Lawrence Lowell, Hermann Oncken, Lindsay Rogers, Herbert Blumer, and more (Lazarsfeld 1957; Noelle-Neumann 1979). As we shall see in the pages that follow, qualities that once mattered deeply to practitioners in the field have found new organs of expression in the digital age. Prior to the advent of survey research, public opinion had to be observed. To be observed, it had to act (DeFleur 1998). Thus, people expressed their views not in anonymous questionnaires, but within a broader community—through newspapers, at public meetings, rallies, and torchlight parades, and by way of a multitude of associations that would "rouse attention" and "excite discussion" (Bryce 1889, p. 240). As a result, public opinion was conceived as something "inherently social and conversational," where average citizens interacted with elites and communicated their views with "varying degrees of influence and aggressiveness" (Anstead and O'Loughlin 2015, p. 215; Sedman 1932, p. 340). Boisterous and imperfect, it was "always leading and always being led" (Oncken 1914, p. 203).

In the modern age, user activity in online discussion forums and social media platforms gives researchers the opportunity to study a phenomenon that is strikingly similar (Herbst 2011). In fact, this essay contends that the messy "behavioral residue" favored by data scientists can, at times, capture public opinion in ways more faithful to the classical tradition than the polls to which we have grown so accustomed (McGregor, Mourão, and Molyneux. 2017, p. 163). With new technologies, it is possible to catch dynamic elements in the formation of opinion within a social setting. We can consider the intensity and influence of attitudes instead of weighting them equally, which may provide a more realistic view of the way in which public opinion exerts power. And finally, we are able to visualize the dissemination of ideas across time and space in granular detail—a task that is difficult, if not impossible, to accomplish using conventional surveys alone (Kleinberg 2008; González-Bailón and Paltoglou 2015; Beauchamp 2016; Ceron and Negri 2016). To put it another way, a measurement revolution driven by a tsunami of data has brought us closer than ever to the invisible machine that Bryce imagined long ago.

Social Science and the Data Revolution

To the Victorian observer of American democracy, the twenty-first century would surely be a marvel. Never before has so much been known about the lives of average people, from their buying habits to their romantic endeavors, physical fitness, driving patterns, and taste in music, to say nothing of their political preferences (Mayer-Schönberger and Cukier 2013; Prewitt 2013). Technology has made it possible to mine everything from social interactions on microblogging platforms like Facebook, Reddit, Twitter, and Tumblr to product reviews, Foursquare check-ins, and geo-tagged Flickr photos in search of raw data that can be converted into sentiment. For scholars, these remnants of human activity collected from a multitude of systems—known as "digital trace data"—have the potential to offer rich insight into complex behaviors that were once out of reach (Howison, Wiggins, and Crowston 2011; Murphy et al. 2014; Japec et al. 2015). The avenues for research they create are both endless and irresistible.

In 2010, a team of computer scientists at Carnegie Mellon University found that sentiment word frequencies on Twitter correlated strongly with contemporaneous polls on consumer confidence and presidential job approval. "It is encouraging," they said, "that expensive and time-intensive polling can be supplemented or supplanted with the simple-to-gather text data that is generated from online social networking" (O'Connor et al. 2010, pp. 128–29). Since then, the same optimism has been applied to a wide array of subjects. Twitter has been used to forecast election results, to chart public awareness of pandemic trends, to gauge the public's interest in climate

change, and even to track temporal patterns of happiness around the world, to name but a few (Dodds et al. 2011; Anstead and O'Loughlin 2015; Cody et al. 2015; Boon-Itt and Skunkan 2020). Some experts in advanced computing and artificial intelligence have bragged that public opinion is "only a few tweets away," while others confidently state that the platform has become one of public opinion's "most effective and truthful indicators" (Ševa, Durić, and Schatten 2016, p. 22; Vora and Mehta 2018, p. 503). As W. Russell Neuman and his colleagues point out, those who embrace the relatively young field of computational social science tend to do so "full of enthusiasm and perhaps a bit of missionary zeal" (Neuman et al. 2014, p. 210). It comes at a cost.

Already, journalists are equating tweets with public opinion when reporting the news (Anstead and O'Loughlin 2015; Beckers and Harder 2016; Dubois, Gruzd, and Jacobson 2018; McGregor 2019), and data scientists have started to do the same by using the phrase interchangeably with opinion mining and sentiment analysis, often with little thought given to what those indicators actually measure, or how results might align with existing theories (Bail 2014; Poorthuis and Zook 2015; Schroeder and Cowls 2018; Ledford 2020). Given the intoxicating pull of technology, these trends are likely to continue—and even accelerate as we move further into the digital age—so the time is ripe to reconsider an obvious, but easily overlooked question: What constitutes public opinion?

For nearly a century, scholars have more or less accepted polls as the only practical means of measuring public opinion, a decision that has been more consequential for the discipline than it might at first appear (Key 1961; Converse 1987). Within the dominant paradigm, public opinion has been conceived as the sum of its parts: an aggregation of individual attitudes that can be equated with the results of polls administered uniformly to a small sample of respondents, selected at random, and interviewed in isolation (Beniger 1992; Glynn et al. 2004). Digital trace data promise virtually none of these things (Schober et al. 2016). Where polls are carefully designed, unstructured text harvested from websites and apps might be described as "found" data in the way it captures the detritus of online activity, repurposed for research (Taylor 2013). For others, it is "organic" in nature because it is generated by the user at will, without the rigor and precision of a representative sample, or even the artificial prompts that standardize response (Groves 2011; Mitchell and Hitlin 2013; Murphy et al. 2014; Hargittai 2015, 2020; Mellon and Prosser 2017). While data scientists may at times liken their approach to "semantic polls," or even "unsolicited polls" (Anstead and O'Loughlin 2015; Cody et al. 2015), the desire to appropriate familiar terminology for something so fundamentally different underscores just how powerful the connection between polls and public opinion has become.

Today, the polling paradigm, with all its assumptions and rules of statistical inference, has grown so central to the discipline that criticism of digital trace data is expressed almost entirely through its singular frame of reference (Murphy et al. 2014; Japec et al. 2015). Analyses of tweets are deemed accurate when they correlate with the results of conventional surveys (O'Connor et al. 2010; Seely-Gant and Frehill 2015; Beauchamp 2016; Schober et al. 2016; Amador et al. 2017; Jungherr et al. 2017; Klašnja et al. 2018; Pasek et al. 2018; Pasek et al. 2019; Hargittai 2020), and to the extent that they fail to align, some recommend a host of "proper statistical adjustments" before proceeding further (Baker et al. 2013; Wang et al. 2015, p. 981; Barberá 2016; Diaz et al. 2016; Conrad et al. 2019; Pasek et al. 2019). While those challenges loom large, the expectation is both unfair and unproductive.

There is a rich history of scholarship—long undervalued by pollsters and nearly unknown among data scientists—that demonstrates not only the malleability of public opinion as a construct, but an additional fact as well. When the meaning of public opinion changes, as it has time and again, technology is the driving force (Habermas 1974; Herbst 1993, 2011). As Philip Converse (1987, pp. S12–13) once said, the invention of polls "had a major impact not only on our understanding of detailed properties and dynamics of opinion, but also on the conceptions which all of us hold—politician, scholar, and citizen alike—as to what 'public opinion' is best taken to mean." The creation of the internet, and of search engines and social media platforms, in particular, has given rise to entirely new and dynamic forms of expression, with the potential to scramble those ideas once again. The way scholars think about their research will undoubtedly follow (boyd and Crawford 2012).

The Classics Revisited

In an essay written for the twenty-fifth-anniversary edition of *Public Opinion Quarterly* in 1957, Paul Lazarsfeld found it useful to circle back to classic works at times like this. In "Public Opinion and the Classical Tradition," he lauded the emergence of survey research in the 1930s and thought it had "greatly extended the field of practical applications," but on balance, he conceded that polling had also narrowed its "conceptual range" (Lazarsfeld 1957, pp. 39–40). Where a fixation on attitudes had steered the discipline toward "microscopic findings," the classics were "of a broader and altogether different nature," especially when it came to understanding the concept of public opinion itself (Lazarsfeld 1957, p. 46). He felt that revisiting the words of James Bryce, Herbert Blumer, Lindsay Rogers, and others could help identify gaps in modern research and offer clues on how to fill them. It might even be possible one day to find "further material" that would verify the classical insights (Lazarsfeld 1957, p. 48). As the prospects for doing

just that inch closer to reality in the digital age, it is necessary to remind ourselves of what those insights were.

PUBLIC OPINION IS INHERENTLY SOCIAL

The first major insight of the classical tradition was to view society as a "din of voices" and a wealth of interacting parts (Bryce 1889, p. 315; Herbst 1993). For James Bryce, the study of public opinion began with its formation. Whether someone's views developed sufficiently to be heard depended on how they were expressed, to whom, and with what level of forethought. The impression of the moment was insufficient, for it was too "rudimentary" and too lacking in "conscious reasoning" to warrant any impact on government (Bryce 1889, pp. 209–10). Over time, however—at least for some—spontaneous thoughts could be refined through conversation with others into positions that had genuine conviction, until, at last, there was the impulse to act. Citizens might speak their mind at a rally, write a letter to the editor, or join a group of like-minded people. These "organs" of opinion were where sentiment was given voice, and that context encouraged Bryce—and many others of the era—to treat public opinion as an interactive consensus built from uneven parts (Shepard 1909; Lowell 1913; Oncken 1914; King 1928; Sedman 1932; Blumer 1948). It was the endpoint of a lengthy process of social and political debate, where opinion was constructed communally through some amalgam of past experience and present fact; from what we think, in part, and from what others tell us.

For Bryce, a logical conclusion followed. Public opinion did not merely grow; it was consciously made (Bryce 1889, p. 315). If organs of opinion both amplified and refined public sentiment, they also played a role in "further developing and moulding the judgment of the people. Opinion makes opinion. Hence every weighty voice, be it that of a speaker, or an association, or a public meeting, or a newspaper, is at once the disclosure of an existing force and a further force influencing others" (Bryce 1889, pp. 232–33; Shepard 1909). In such a complex system, individuals could never be viewed in isolation.

Polls would do exactly that in years to come, shifting the discipline away from its historical roots (Korzi 2000). As Lindsay Rogers complained, polls failed to create the time and "institutional space" necessary for discussion among citizens to occur (Rogers 1949; Fried 2006, p. 557). In fact, they had a tendency to abort the process of opinion formation entirely by interviewing respondents anonymously, without risk of social isolation, and at a rudimentary stage of development, where opinion was little more than vague inclination (Noelle-Neumann 1979). According to Herbert Blumer, a more realistic approach was needed. If public opinion acquired its shape from the structure

in which it moved, it was essential to witness the messy interaction of its elements within a functioning society.

> That is, we ought to begin with those who have to act on public opinion and move backwards along the lines of the various expressions of public opinion that come to their attention, tracing these expressions backward through their own various channels and in doing so, noting the chief channels, the key points of importance, and the way in which any given expression has come to develop and pick up an organized backing out of what initially must have been a relatively amorphous condition. (Blumer 1948, p. 549)

In 1948, the problem was that no such model existed.

NOT ALL OPINIONS ARE CREATED EQUAL

A second insight was equally obvious to writers who hewed to the classical tradition. To study public opinion within its natural social setting meant acknowledging differences among people. On the one hand, the competence of the masses varied. According to Bryce, some men were of a serious and informed disposition, which led them to engage actively in political affairs, but most had little time for such things. As a consequence, their views had "little solidity and substance" and were expressed more as causal sentiment than deliberate thought (Bryce 1889, p. 212; Lippmann 1922). Likewise, opinions differed in their intensity of belief. While most men were passive and happy to remain so, small but energetic groups might on occasion triumph over larger interests on matters of policy. With both observations in mind, Bryce decided that public opinion was more than a simple counting of noses, where each man was accorded equal weight. As A. Lawrence Lowell went on to explain in 1913, "one man who holds his belief tenaciously counts for as much as several men who hold theirs weakly, because he is more aggressive, and thereby compels and overawes others into apparent agreement with him, or at least into silence and inaction." To put it bluntly, views were always "weighed as well as counted" (Lowell 1913, p. 13).

The invention of polls changed that, too. Rogers (1949, p. 9) griped that questionnaires were capable of revealing little more than "the numbers of persons who answered yes or no or who confessed ignorance or indifference when they were asked specific questions." In their very design, polls valued internalized attitudes more than their observable manifestations, and in doing so divorced opinions from the intensity with which they were held (Ginsberg 1986). Moreover, as Blumer pointed out, groups differed not only in the passion with which they held their convictions, but in their "strategic position" and their "opportunities to act" (Blumer 1948, p. 544). Without a firm understanding of that hierarchy, polls raised more questions that they resolved.

> We do not know whether the individual has the position of an archbishop or an itinerant laborer; whether he belongs to a powerful group taking a vigorous stand

> on the issue or whether he is a detached recluse with no membership in a functional group; whether he is bringing his opinion to bear in some fashion at strategic points in the operation of society or whether it is isolated and socially impotent. (Blumer 1948, p. 546)

That some people had power and influence, and others not—and that polls failed to capture an essential truth—was a fact so obvious to Blumer that it required no further explication.

PUBLIC OPINION IS ACTIVE AND DYNAMIC

One final insight warrants attention here. According to the classical tradition, public opinion was not only socially constructed and more than the arithmetic sum of its parts; it moved. It might be "as slow and imperceptible as the wasting away of some huge cliff by the action of wind and tide" (Butler 1873, p. 242), but it could also be as "treacherous" as a tidal wave (Oncken 1914, p. 203). It exerted a palpable force within the broader political system, even if scholars had to resort to wild imagery because it was difficult to quantify. Some, like Rogers (1949, p. 58), would continue to insist that public opinion was not—and could never be—a measureable concept because it was too "subject to change and fluctuation," but change and fluctation were entirely the point. As John Dewey (1927, p. 178) wrote in *The Public and Its Problems*, public opinion was merely "intermittent" when it was not the product of continuous investigation, and only "continuous inquiry" could provide meaningful results.

For all of the scientific rigor that polls provided, their rigid methods both smoothed and flattened the dynamics of public opinion by recording attitudes of no duration, as if in a moment of suspended animation (Fitzgerald 2008). For the classical theorists, this would never be enough. In 1889, James Bryce tried to imagine a day when public opinion would be ascertainable at all times, though no country had achieved it. In 1948, Herbert Blumer held out some hope at the end of his seminal essay on public opinion and polling but admitted there was no model as yet. It was Dewey (1927, p. 177) who expressed the stakes so well. Unless there were "methods for detecting the energies which are at work and tracing them through an intricate network of interactions to their consequences," the study of public opinion would never amount to much.

Data Science and the Classical Tradition

Lazarsfeld found abundant value in revisiting the classical tradition in 1957. He felt that new empirical methods might lend "sharper conceptual tools" to the study of public opinion, allowing scholars to view the classics through fresh eyes (Lazarsfeld 1957, p. 41). He hoped that revisiting old theories

would bring renewed attention to ideas that were long overlooked. And above all, he recognized that progress was by no means over. He saw the state of the discipline as a continuous process that evolved with technology itself. Understandably, there were periods of conflict and dissention, but the task was clear. It was to bend those stages of development into a loop to see how the early phases meshed with those that came later. To do that, he said, was "almost always productive" (Lazarsfeld 1957, p. 41). It remains so in the digital age.

VISUALIZING SOCIAL NETWORKS

First, for early scholars who insisted that public opinion formed communally and that it had to be observed within a proper social setting, the online discussion boards and microblogging platforms of the twenty-first century provide a tantalizing glimpse of a process that was, until recently, difficult to gauge. The classical tradition was right, says Herbst (2011, p. 92), to treat public opinion as "a phenomenon in motion, replete with power dynamics, social stratification, and most of all, conversation." Where surveys isolate and atomize by design, new approaches to the study of public opinion both recognize and celebrate interactivity in ways that would be familiar to men like Bryce and Blumer.

The digital age has produced an endless number of virtual communities where users can create, edit, and share content with unrivaled ease, whether in groups or with others around the world. Functionally, these new organs of opinion are equivalent to the town halls, salons, and coffeehouses of a bygone age—"brilliant, uneven, wild, and ridiculous all at once" (Speier 1950; Herbst 2011, p. 95). That their casual dialogue often falls short of real deliberation, and further still from more idealized versions of the public sphere, need not diminish their value to scholars (Habermas 1974; Peters 1995; Papacharissi 2002, 2010; Downey and Fenton 2003; Fishkin and Luskin 2005; Langman 2005; Benkler 2007; Hindman 2009). Rather than theorizing about ideal forms of speech or constructing it through artificial means (Habermas 1974; Fishkin and Luskin 2005), digital trace data allow us to capture unvarnished aspects of society, just as writers in the classical tradition preferred. In *The American Commonwealth*, Bryce's intent was to "paint the institutions and people of America as they are," not as they behave at their best (Bryce 1888, p. 4). In a similar way, Rogers (1949, p. 26) encouraged scholars to use more "realism" when studying public opinion, a word so imperative to Blumer that he employed some form of it nine times in the course of a single essay. In the end, he insisted that if public opinion was to be studied in an authentic way, "its depiction must be faithful to its empirical character" (Blumer 1948, p. 543). Digital trace data bring us closer.

By mining user-generated content, in addition to the volume of Likes, followers, tags, and shares, social media platforms can be used effectively to capture expressive behaviors and emotions, as well as the interaction of users within broad social networks (Cha et al. 2010; Kwak et al. 2010; Wilson, Gosling, and Graham 2012; Waterloo et al. 2017). For instance, Twitter has been mined exhaustively to further our understanding of how sentiment evolves (Xiong and Liu 2014), of how communities are built and maintained through acts of social bonding and peer endorsement (Harrigan, Achananuparp, and Lim 2012; Gruzd and Haythornthwaite 2013; Colleoni, Rozza, and Arvidsson 2014; Sherman et al. 2018), and of how political elites, the media, and average citizens shape the public agenda with their "complex and dynamic interaction" (Neuman et al. 2014, p. 193; Clark et al. 2018; Edgerly and Thorson 2020; McGregor 2020). None are subjects that could be studied easily through surveys alone. Within the dominant paradigm, there is a temptation to treat such things as a "distortion" or "contagion" that might disrupt the near laboratory conditions of a well-designed poll, but such a view misunderstands the insights of the classical tradition (Fitzgerald 2008, p. 49; Anstead and O'Loughlin 2015, p. 214). To ignore the world outside our heads, in favor of that within, is to accept a view of public opinion that is far less rich than it ought to be.

UNDERSTANDING INFLUENCE AND THE FLOW OF INFORMATION

Second, for scholars of the classical tradition who insisted that public opinion was more than the aggregated sum of its parts, digital trace data provide the means to observe the broader system in which a variety of actors exert influence. That online discussion forums and social media platforms fail to provide an environment of equals may be disqualifying for pollsters who insist upon samples drawn at random, but an entire generation of academics once agreed with A. Lawrence Lowell when he asserted in *Public Opinion and Popular Government* in 1913 that the intensity of opinion mattered. To insist that public opinion be measured "by the mere number of persons to be found on each side of a question" was to adopt a wholly unrealistic view of the way politics worked in practice (Bourdieu 1973; Lowell 1913, p. 13).

Ever since the collapse of *The Literary Digest*'s straw poll in 1936, the principal objective of public opinion research has been to obtain a representative sample—a goal that is both a statistical necessity and a normative choice for those in the profession (Verba 1996). For scholars to accept anything less "has long seemed either unscientific or undemocratic" (Peters 1995, p. 19). Nonetheless, for men like Lowell, both goals were patently naïve. Blumer, in particular, found it baffling that pollsters would attempt to sample such a "complicated system of interacting parts," especially when those chosen at random were unlikely to share equally in the whole (Blumer 1948, p. 549).

Those working within the classical tradition recognized that views expressed in society were never merely counted; they were also weighed.

As in earlier eras, information in the digital age remains a resource of unequal power and potential. Not only do social media platforms amplify that bias with users who are younger, better educated, and more politically engaged than the general population (Gayo-Avello 2011; Keeter 2012; Mitchell and Hitlin 2013; Murphy et al. 2014; Hargittai 2015, Mellon and Prosser 2017; 2020), but they tend to be dominated by a small but active group of core users who drive discussion (Wu et al. 2011; Parmelee 2013). With that in mind, most scholars see these muted or "omitted voices" as a glaring weakness of digital trace data (Hargittai 2020, p. 10). When viewed through the lens of the classical tradition, however, it becomes an unexpected asset. Sites like Twitter are at their best for research not when they attempt to reproduce the representative qualities of a conventional poll, but when they provide new insight into matters that polls have struggled to resolve (Jungherr et al. 2017). Capturing the intensity of opinions and the way they wield power are among those elusive areas of interest.

To be fair, pollsters have never ignored the properties of public opinion. The strength, stability, and latency of attitudes all mattered to the early empiricists, including Floyd Allport, Harwood Childs, Hadley Cantril, and V. O. Key. They understood that it was important to distinguish between "a superficially held view," on the one hand, and a "cherished conviction," on the other (Cantril 1944, p. 51). And they knew that varying degrees of competence would lead naturally to some "vertical ordering of actors" (Converse 1964, p. 2). For V. O. Key, in particular, the relationship between political elites and the masses—the leaders and the led—was the "missing piece of the puzzle" when it came to the practice of democratic politics. Proper sampling procedures and careful attention to questionnaire design could go only so far. Survey data, he said, "tell us almost nothing about the dynamic relations" between the two. "That these political influentials both affect mass opinion and are conditioned in their behavior by it is obvious," and yet our knowledge "remains far from satisfactory" (Key 1961, pp. 536–37). Digital trace data can begin to fill those gaps.

While social scientists have long recognized the power of "opinion leaders" in shaping discourse, the methods used have been far from perfect (Katz and Lazarsfeld 1955; Zaller 1992; Stewart, Smith, and Denton 1994). Rather than relying on self-reported survey responses, online discussion groups and microblogging platforms provide new means to identify elite users and watch as they create, exercise, and maintain power (Watts and Dodds 2007; Dubois and Gaffney 2014; Grčar et al. 2017; Weeks, Ardèvol-Abreu, and de Zúñiga 2017; Dagoula 2019). Today's opinion leaders are those who influence the flow of information in an increasingly fragmented and polarized media environment. They "trigger replies, spark long conversations," and otherwise

shape the language that is used by others within a community (Huffaker 2010, p. 609). For data scientists, the influence they wield might be measured by the number of followers (Bakshy et al. 2011), the frequency with which users are mentioned and posts are shared (Cha et al. 2010), or even through cascading hashtags that demonstrate someone's ability to spread their views far and wide (Wu et al. 2011; Rattanaritnont, Toyoda, and Kitsuregawa 2012).

The insights gained from studies like these are often richly textured, demonstrating that effort and connectivity often matter more than size or celebrity. As the United Kingdom voted to leave the European Union in 2016, one team of scholars applied machine learning techniques to a large corpus of political tweets to identify the most influential accounts in the "Brexit" debate. Their results showed a nuance lost in a sea of conventional polls that eventually mispredicted the outcome. Namely, an active and organized Leave community on Twitter had considerably more influence over the language that framed the campaign than their Remain counterparts, despite a far smaller and more highly polarized community of users (Grčar et al. 2017). As Converse (2006, p. 2) once said, sometimes "the logic of numbers collides head on with the logic of power." That inference would not have surprised Blumer in the least.

CAPTURING GRANULAR DETAIL OVER TIME AND SPACE

Finally, digital trace data share one final property with classical conceptions of public opinion—an active and dynamic element. Where surveys take "a snapshot of public opinion at fixed and relatively broad intervals" (Ripberger 2011; Ceron and Negri 2016, p. 133), new technologies offer a continuous film in bright and vivid detail. Today, microblogging platforms provide a steady stream of information on the public's policy mood, internet search queries offer insight into the vagaries of public attention, and tweets and trending hashtags can be monitored for instantaneous reaction to breaking news stories, rather than waiting for the next round of polls to appear (Kozlowski 2012; Mellon 2013; Seely-Gant and Frehill 2015; Whitman Cobb 2015; Diaz et al. 2016). As Kleinberg (2008, pp. 66–67) notes:

> At the scales of tens of millions of individuals and minute-by-minute time granularity, we can replay and watch the ways in which people seek out connections and form friendships on a site like Facebook or how they coordinate with each other and engage in creative expression on sites like Wikipedia and flickr. We can observe a news story suddenly catching the attention of millions of readers or witness how looming clouds of controversy gather around a community of bloggers. These are part of the ephemeral dynamics of ordinary life, now made visible through their online manifestations.

The result may well spark a revolution in the way scholars think about political systems.

Where survey research struggles to capture dynamic swings in public opinion, microblogging platforms can be used to watch how new ideas emerge, how social contagions spread, and how misinformation propagates at alarming speed (Jin et al. 2014; Grinberg et al. 2019; Niles et al. 2019; Kouzy et al. 2020). In a similar way, the scale of digital trace data makes it possible to examine the spatial distribution of opinion more fully than in polls, whether it be small US states that are perennially under-surveyed during presidential campaigns, or voices of unrest in the Arab world that might otherwise go unnoticed or suppressed (Yardi and boyd 2010; Younus et al. 2011; Elson 2012; Beauchamp 2016; Diaz et al. 2016; Warshaw 2016). All of these opportunities bring us closer than ever to observing public opinion in all places and at all times. It was Dewey (1927, p. 179) who believed that "inquiry must be as nearly contemporaneous as possible" to the events at hand, lest it be "only of antiquarian interest." Nearly a century later, achieving that has become far easier.

The Quest to Ascertain

"The obvious weakness of government by opinion is the difficulty of ascertaining it" (Bryce 1889, p. 315). That single, provocative sentence in *The American Commonwealth* (1889) has done more, perhaps, than any other of equal economy to define the academic study of public opinion. In its appeal to democratic theory and an apocryphal fourth stage of evolution in which the people would not just reign, but govern, scholars of the classical tradition can point to Bryce's work as a "chief authority" on the subject with as much ease as the empiricists who followed in his footsteps (Lazarsfeld 1957; Dion 1962, p. 572). For Bryce, of course, "the machinery for weighing or measuring the popular will from week to week or month to month" did not exist in the late nineteenth century, nor could he foresee when—or if—it would ever be invented (Bryce 1889, p. 221). Yet for George Gallup and other early pioneers of the polling profession, those words would become a clarion call to "the most useful instrument of democracy ever devised" (Gallup 1965, p. 544). It should remain so for a new generation of data scientists.

If the history of public opinion research is centered around its quest to ascertain, then forward momentum has always come in the form of new technology (Herbst 1993, 1998). As Frank Newport (2011, p. 602) observed in his presidential address to AAPOR in 2011, "if there is one thing we have learned over and over again, it is that nothing stands still." The organs of opinion that scholars once observed—voting in elections, attending meetings, joining groups, writing letters, or otherwise agitating in the streets—have been augmented over time by others of greater scientific precision. While

polls derived from random probability samples were the machinery that first made it possible to capture public opinion at regular intervals, the digital age may one day do so continuously and with nearly invisible gears. Before that happens, there is much to gain from revisiting the discipline's historical roots.

To begin, parallels between the new frontier and the last are unmistakable. In the 1930s, survey research was initially met with suspicion in academic circles, a historical fact that is easily forgotten when reading the "canonical voices" of the empirical movement alone (Althaus 2006, p. 79). For those working within the classical tradition, public opinion emerged from "a complicated system of interacting parts" (Blumer 1948, p. 549). The summation of individual attitudes, especially those weighted equally and expressed anonymously at static points in time, was precisely what public opinion was not (Converse 1987). Eventually, however, messy debates over the meaning of public opinion and its role in a democratic society were "overwhelmed by the sheer pull of Gallup's technology" (Fitzgerald 2008, p. 46). With pollsters now the gatekeepers of a dominant paradigm, and the machinery evolving once again, the question of what is—or is not—public opinion has returned to center stage. Like the pioneers of the polling industry, computational social science has contributed to an explosion of creativity, but that work has faced a degree of skepticism similar to what their forebearers faced in the 1930s. Revisiting the classical tradition offers two pathways forward. First, for those who believe that scholarship based on digital trace data has been poorly theorized, the classical tradition provides a strong justification for the work that data scientists do in text mining and sentiment analysis (Bail 2014; Schroeder and Cowls 2018; Ledford 2020). And second, it offers clues to how emerging technologies might be used most effectively in the future.

For scholars like Bryce and Blumer, who valued conversation more than counting, the internet and its multitude of websites, platforms, and apps have created a wealth of interactions that mesh well with early phases in the academic study of public opinion (Lazarsfeld 1957). Ultimately, these technologies have value not because they reproduce the representative qualities of a poll, but because they leverage their own unique properties over matters that scholars have struggled to resolve, offering new insight into timeless questions about who says what, to whom, in what channel, and with what effect (Lasswell 1948). Where polls are designed to extract the thoughts inside our heads, the world outside is best captured through other means. As we have seen, by accepting digital trace data as a valuable tool in the study of public opinion, we bring "sharper conceptual tools" to our work on opinion formation, the exchange of ideas within the public sphere, the relationship between opinion leaders and the masses, and the dynamics of public attention, to name but a few (Lazarsfeld 1957, p. 41).

Finally, the lessons that Lazarsfeld gleaned from the classical tradition deserve renewed attention because of his desire to bring the profession closer to a meeting of the minds. The study of public opinion has always been engaged in a "subterranean struggle" between two fundamentally different approaches—the classical tradition and its empirical cousin, both of whom have equal right to trace their legacy back to Bryce and the quest to ascertain (Herbst 2011, p. 88). According to Harwood Childs, *Public Opinion Quarterly* was, from the beginning, "looked upon not so much as the house organ of a new academic discipline, but as a vital tool of inter-disciplinary research," a laudable goal that it fell short of achieving in its early years (Childs 1957, p. 13). If the methods used to measure public opinion are to be selected according to the needs of the research question at hand, without any "blind allegiance" to one approach over another, collaboration will be an indispensable part of the digital age (Groves 2011; Newport 2011, p. 602; Keeter 2012). Those trained in survey research may lag in the methodological skills required to scrape text and mine it for sentiment (Cowls 2014). At the same time, while data scientists have developed powerful new tools for the automated analysis of text, few have the theoretical background needed to establish context and extract meaning. As Bail (2014, p. 478) puts it: "Little can be learned from big data without big thinking."

To build upon the legacies left by James Bryce, A. Lawrence Lowell, Lindsay Rogers, Herbert Blumer, and countless others who worked within the classical tradition, scholars will need to "think harder and longer about the meaning of public opinion" in years to come, and about its place in modern democratic life (Herbst 1998; Korzi 2000, p. 53). Merging the richer, theoretical side of public opinion research with its more practical, empirical methods has long been advised (Albig 1957; Lazarsfeld 1957; Dion 1962; Price and Neijens 1997; Althaus 2006; Price 2008; Anstead and O'Loughlin 2014; Bail 2014). Attaining it now through partnership across disciplines is more essential than ever. In the end, the study of public opinion is a complex pursuit. In words that Lazarsfeld (1957, p. 634) wrote long ago, but that ring equally true today: "We pollsters cannot be expected to tackle the whole problem by ourselves."

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