Just what is data-driven campaigning? A systematic review

Katharine Dommett, Andrew Barclay & Rachel Gibson

Routledge
Taylor & Francis Group

Just what is data-driven campaigning? A systematic review

Katharine Dommett[a], Andrew Barclay[a] and Rachel Gibson[b]

[a]The Department of Politics and International Relations, The University of Sheffield, Sheffield, UK; [b]The Department of Politics, The School of Social Sciences, The University of Manchester, Manchester, UK

ABSTRACT

Discussions of data-driven campaigning have gained increased prominence in recent years. Often associated with the practices of Cambridge Analytica and linked to debates about the health of modern democracy, scholars have devoted considerable attention to the rise of data-driven politics. However, most studies to date have focused solely on practice in the US, and few scholars have made efforts to define the precise meaning of 'data-driven campaigning'. With growing recognition that data-driven campaigning can take different forms dependent on context and available resource, new questions have emerged as to exactly what features are indicative of this phenomena. In this piece we systematically review existing discussions of data-driven campaigning to unpack the components of this idea. Identifying areas of convergence and divergence in existing discussions of 'data', 'driven', and 'campaigning', we classify existing debate to highlight integral features and variable practices. This article accordingly provides the first comprehensive definition of data-driven campaigning, and aims to facilitate international study of this activity.

Introduction

Data is the new currency of society. This claim, made by numerous CEOs and marketing executives has in recent years permeated the world of elections and democratic politics (Bartlett, 2018). Mapping the rise of 'technology-intensive campaigning' (Kreiss, 2016) and parties' use of 'big data' (Nickerson & Rogers, 2014) has increasingly become a scholarly preoccupation, with 'data-driven' activities now seen to be dominating modern electioneering (Dommett, 2019; Kefford, 2021; Kruschinski & Haller, 2017). Although references to data-driven campaigning (DDC) have become commonplace in academic studies, it is not always clear what scholars mean when they use the term. A brief survey of the literature reveals very few formal definitions of DDC as a concept, with most accounts referring to campaigns' use of specific practices such as micro-targeting, voter profiling and the use of A/B testing. This has resulted in considerable ambiguity

about what exactly DDC is, and how far it differs from other modes of understanding election campaigning.

This lack of clarity poses challenges in light of recent efforts to study DDC in previously neglected country and party contexts (Kefford et al., 2022). Given its early adoption and diffusion primarily within US elections, the prevailing understanding of DDC has unsurprisingly reflected its national origins. It remains unclear, however, if the attributes seen to define DDC in the US should be taken as core features of DDC in other contexts. With a growing literature showing that DDC can vary in accordance with the regulatory and systemic context in which it operates (Kruschinski & Haller, 2017), our expectation is that DDC will manifest differently across countries and parties. We therefore diagnose a need to look beyond the US case to clarify what is and is not indicative of DDC, isolating those features that mark it out as a distinctive mode of campaigning. In producing a new definition we aim to reframe analysis to focus not on the presence of specific practices (commonly found in the US) such as microtargeting, but to instead focus on the particular type of campaign decision-making that is captured by the term DDC. In doing so we propose a new definition that is at once sufficiently generic and minimalist in the traits identified as to apply across a range of contexts, but that allows for adaptation and variance in how those traits are manifested and observed *in situ*.

To identify the integral and defining traits of DDC, we conduct a systematic review, examining existing depictions of DDC to understand how this activity is currently understood within the relevant literature. Specifically, we argue that it is fruitful to break DDC down into its component parts to explore the varied ways in which 'data', 'driven' and 'campaigning' are being conceived. Differentiating between integral features and variable practices, we construct a new definition of DDC as follows:

> DDC relies on accessing and analyzing voter and/or campaign data to generate insights into the campaign's target audience(s) and/or to optimize campaign interventions. Data is used to inform decision-making in either a formative and/or evaluative capacity, and is employed to engage in campaigning efforts around either voter communication, resource generation and/or internal organization.

Equipped with this definition it becomes possible to identify those instances in which data is present, but DDC is not (i.e., when data is not being used to drive decisions in relation to campaign practice), and to show which forms of campaign activity are most commonly conducted in line with the tenets of DDC. Our definition therefore moves beyond a US-centric, practice-based conceptualisation to facilitate comparative study of where and in what form DDC occurs.

The remainder of the paper is structured as follows. We first highlight how initial attempts to define data-driven campaigning lack consensus in important respects. We then seek to understand the different ways in which scholars have conceptualised the three components of this concept; namely, what is meant by 'data', 'driven' (understood as the extent to which campaign strategy and organisation is dictated by data) and 'campaigning'. Classifying areas of commonality and divergence in discussions of each idea, we highlight those attributes which are required indicators of DDC and those which can vary depending on space and time. Through this activity we clarify what is distinctive about DDC whilst recognising the potential for DDC to be manifest differently.

Existing Definitions of DDC

Recent years have seen growing interest amongst public and academic audiences in how election campaigns are harnessing data, significantly as a response to the perceived importance of data for the victories of the Trump and Vote Leave campaigns in 2016 (Kefford, 2021). Within academia this interest has given rise to scholarly research on what has been termed 'data-driven campaigning' (2019; Anstead, 2017; Baldwin-Philippi, 2017; Dobber et al., 2017; Dommett, 2019; Kefford, 2021; Kreiss, 2016; Kruschinski & Haller, 2017; Papakyriakopoulos et al., 2018; Römmele & Gibson, 2020). Explicit attempts to define DDC are scarce. Rather than outlining definitional parameters, scholars tend to treat certain practices as indicative of this phenomenon. Activities such as micro-targeting, voter profiling and using 'big data' are thus commonly associated with, and used to signal the presence of DDC.

The definitions that have been developed differ in scope, both in the activities involved and the particular practices that characterise it. Baldwin-Philippi for instance argues that DDC is associated with specific processes, arguing that:

> '[a]t the most overarching level, data-campaigning involves two genres of practice: targeting and testing. They can each be put to use toward a variety of campaign goals, including persuading members of the public to support their candidates, or mobilising people to take some sort of action, most often donating money or getting out the vote (GOTV)' (Baldwin-Philippi, 2019, p. 3).

For Baldwin-Philippi, both targeting and testing are longstanding practices that allow campaigns to use data to decide 'which messages go to what potential voters at what time during the campaign' and to 'empirically measure how well messages perform against one another' (Ibid., p. 4).

Munroe and Munroe (2018) provide a different perspective on DDC which shifts the focus from voter targeting towards a more dynamic process-based definition that is disaggregated into three different stages. First, a campaign can only be data-driven if it perceives data to be a resource, afforded similar status to money or volunteer time (Ibid., p. 3). Second, a data-driven campaign must generate its own data, either through integrating existing data (such as merging canvass data with the electoral roll), inferring data about voters' political attitudes after analysing other data about them, or tracking the activity and performance of the campaign (Ibid., pp. 3–4). Finally, 'a data-driven campaign is one in which decisions are guided by data rather than by instinct, guesswork, intuition, tradition, or rules of thumb' (Ibid., p. 4). DDC therefore is better understood by the status it affords to data, rather than specific practices such as voter targeting.

Römmele and Gibson (2020, p. 597) have also defined DDC, arguing that these campaigns are characterised by highly sophisticated and efficient forms of voter targeting, achieved at scale by using digital technologies. This depiction appears to exclude more rudimentary or offline forms of data use – such as using opinion polling to form target audiences – from the scope of DDC, and yet others have acknowledged the importance of campaigns adopting a wider range of social science methods (Baldwin-Philippi, 2017; Issenberg, 2012).

In contrast again, Kefford (2021, p. 6) describes DDC as 'a set of inter-locking practices and processes which includes collecting data, building models of the electorate, creating supporter and persuadability scores, [and] segmenting and targeting voters at the

individual level'. These ideas, particularly concerning the importance of targeting individual voters, are found elsewhere, with Brkan (2020) arguing that 'one of the core traits of data-driven political campaigns is that they rely on targeted political messages' (p. 776). And yet this notion is not universally agreed upon. Indeed, Dommett (2019, p. 11) has noted that political campaigning reliant on data needn't necessarily be targeted, as campaigns can use data in untargeted and untested ways. Such accounts show that, when it comes to specifics, there is little consensus about the type of activity that defines DDC and distinguishes it from other campaigning forms. This, in turn makes it challenging to determine if DDC is something new, and how this activity may vary over space and time.

Part of the reason that the few existing definitions of DDC that exist have not been more widely adopted within the literature, we argue, is due to their overly narrow focus on particular practices that centre almost exclusively on the data component of the term, and have limited applicability outside the US. Here we make the case for a new definition of DDC that is both more extensive in terms of focusing on a wider set of components than simply data, and more limited or 'skeletal' in nature, in terms of allowing for 'local' variance and adaption to a particular context. To do so we conduct a systematic review of the extant literature to identify what is core or necessary for DDC to be taking place, and those features that are more peripheral or can vary. Our definition thus rejects the idea of a 'one size fits all' understanding of DDC, which we contend has been an implicit assumption of much scholarship to date. Instead, and in line with the growing body of empirical and comparative research on this topic, our approach assumes that while there are certain core features that mark out DDC as a strategic practice, it can take different forms dependent on context (Bennett & Lyon, 2019; Kruschinski & Haller, 2017). Indeed, as Kefford et al. have argued, the 'highly resourced presidential campaigns' found in the US 'are an outlier compared to most election campaigns' (2022, p. 2).

For this reason, there is a need to interrogate the definitional boundaries of DDC to determine the attributes that distinguish this particular form of campaigning from other practices. Accordingly, we conduct a review of the existing literature on DDC, identifying a range of studies focused on practice both within and beyond the US to examine how DDC has been characterised. Taking each element of this phenomena in turn, we set out to review what the existing literature says about:

1 the types of data that campaigns use,
2 the extent to which data 'drives' strategic decisions, and
3 the specific campaign activities which are informed by data.

Specifically, we highlight variations in empirical practice and conceptual understanding to build up a picture of the integral and variable traits of DDC. On this basis, we turn in the discussion to present our own definition of DDC and to reflect on what distinguishes this activity and the type of variation that scholars can expect to observe.

Method

We employed a systematic approach to gather sources that spoke to employing data in democratic politics. This form of systematic review has been shown to be especially useful

in cases such as ours where existing literature is scarce or disparate, as they are the best way of accounting for the quantity and quality of existing evidence (Dacombe, 2018). Systematic reviews require researchers to specify the criteria that they use to identify relevant sources at the outset, and then to consistently apply these criteria when searching the literature (Oliver & Cairney, 2019). With this in mind, we generated a list of terms to search two of the largest social science databases; Scopus and Web of Knowledge for relevant academic publications, as well as OpenGrey for grey literature.[1] These terms were designed to ensure that relevant literature contained at least one reference to each of (i) data, (ii) the strategic goals or technical practices of DDC, and (iii) election campaigns or democracy (Table 1).[2] These searches initially delivered 363,123 (Scopus) and 152,654 (Web of Knowledge) results which were screened following the PRISMA model (Moher et al., 2009) to evaluate their eligibility. As part of this process, we first used filter options within databases to exclude sources from non-cognate journals.[3] We then collated the remaining sources, before sifting through their titles to check if they either made specific reference to using data in elections, or were sufficiently relevant to the subject area to warrant further inspection. This process produced a list of 194 articles, monographs and chapters from edited volumes for final eligibility testing that involved two authors reading each abstract to examine if the source should be included for analysis.[4] Following this final screening, we were left with 80 cases for analysis (the full breakdown of each stage is displayed in Figure 1).
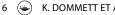
Having identified relevant sources, we carried out an inductive thematic analysis (Neuendorf, 2018). This approach contrasts to an established deductive tradition that seeks to develop and test hypotheses either quantitatively or qualitatively through a process of systematic review (Yom, 2015). Instead, we sought to generate a 'bottom-up' (Tracy, 2019) understanding of this phenomenon based on a close reading and manual coding of the original source material.

Our analysis was broadly guided by the stages of thematic analysis set out by Clarke and Braun (2014). We first identified instances where literature spoke to the initial 'macro' themes of our analysis – i.e., data, its role in driving campaign strategy, and the specific campaign activities that data is used to inform. Extracting key passages from our final selection of articles, we conducted further in-depth reading to develop an additional range of sub-themes for each macro-category. This involved examining the number of papers which spoke to each sub-theme, as well as noting cases of disagreement within each aspect of DDC.

Before presenting the detailed discussion of our findings we provide a descriptive meta-analysis of our data, offering a holistic picture of a literature which is fragmented over time and between countries (Glass, 1976; Joathan & Lilleker, 2020) (Table 2).

Table 1. Keyword Search Criteria. P.8.

Component	Search terms
1	Data*
2	Digital OR analytics OR big-data OR {big data} OR {social media} OR microtargeting OR micro-targeting OR {online advert*} OR {target*} OR {behavioural science} OR {individual targeting} OR {targeted appeals} OR {targeted advert*} OR algorithm OR communication OR datafication OR marketing OR profiling OR computational
3	Campaign* OR democra* OR election OR parties OR voter* OR {Cambridge Analytica} OR disinformation OR misinformation OR propaganda

Identification

363,123 (SCOPUS) & 152,654 (Web of Knowledge) records identified though database searches

Screening

238,305 records post initial screening → 238,111 records screened

Eligibility

194 full text articles assessed for eligibility → 114 articles excluded
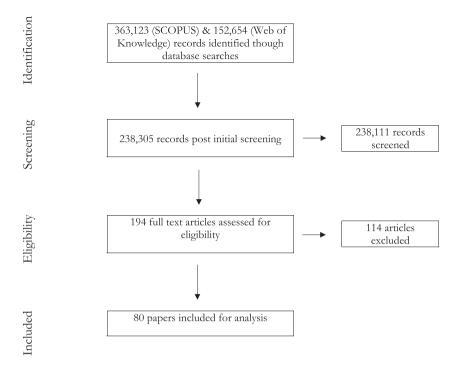
Included

80 papers included for analysis

Figure 1. Review process detailing inclusion/exclusion using the PRISMA Process. P.9.

This reveals two things. First, as noted by Kefford (2021), a substantial majority of studies focus on the US; over two thirds of our sources had the US as the focus of study. Most other cases examined other established democracies, with very few from outside either the US, Canada or Western Europe. Indeed, barring a single study from Brazil, we don't find any cases whatsoever from the Global South.[5] This is highly revealing of how our current understanding of DDC is being driven by accounts from a small number of political contexts. However, we captured data from enough countries outside of the US to highlight universal attributes of DDC from elsewhere.

Second, we found that research on DDC is generally very recent; a large majority of cases were published since 2016, and notwithstanding that systematic reviews will inevitably not achieve complete coverage, the earliest case matching our criteria was from 2001.[6] This suggests that variations in existing definitions are unlikely to reflect change

Table 2. Studies arranged by area of focus & publication date. P.10.

	Published 2001–2005	2006–2010	2011–2015	2016–2021
US	5	4	10	29
UK		2	2	11
Canada				3
Germany			1	5
EU	1			4
Netherlands				3
France				3
Australia	1			
Brazil				1
Finland			1	

Source: Authors own Analysis.

over time, as most accounts focus on the same period. Making these points, in the next section we examine what this literature on DDC says about each of its three constituent parts: 'data', 'driven' and 'campaigning'. By identifying points of consensus and divergence, we classify universal attributes associated with DDC and more particular, context specific practices.

What does the literature say about the 'data' within data-driven campaigns?

Accounts of DDC tend to not exhaustively detail the types (and uses) of data which are indicative of this form of campaigning. Here, we aggregate their insights by cataloguing the different 'types of data' referred to within existing literature and review discussions of how these data are analysed, highlighting universal trends and more particular examples or foci.

Types of data

Existing accounts of DDC point to a variety of different data sources, reviewed in Table 3.[7] We distinguish between two broad categories. First, 'voter data' captures data about citizens and includes such information as their voter registration data, their party preferences and/or their other opinions and interests. Such data is universally regarded as valuable to campaigns insofar as it provides 'a list of citizens to contact' (Nickerson & Rogers, 2014, p. 53), and allows parties to target 'campaign communications more efficient[ly]' (Ibid. p. 54). Scholars identify many different types of voter data, and describe how this information is often stored in databases of different degrees of size and sophistication (Lavigne, 2021; Moore, 2016, p. 426). They also point to different 'raw' data types, originating online or offline, and the potential to model voter data to build more

Table 3. Types of Data included as a part of DDC. P.13.

Category	Type of data	Description
Voter Data	Public Data	Data on voters held by public bodies which are made available to campaigns (Typically demographic information and in some cases party ID, e.g., voter registration data from the electoral roll).
	Canvassing Data	Data gathered through direct contact with voters, typically face-to-face or via phone conversations. Typically voting intention or other measures of voters' political attitudes.
	Purchased Data	Data which campaigns buy from a third party. Examples include data purchased from 'data brokers', such as lifestyle, purchase history or demographic data, or opinion poll data from polling/market research companies.
	Social Media Data	Data on voters held by social media platforms, who campaigns can target by providing these platforms with either a list of individual voters, or other targeting criteria..
	Digital Trace Data	Data observed about voters from their online activity (e.g., browser activity).
	Modelled Data	Data based upon predictions made about voter preferences and/or characteristics from the data that campaigns already possess about them (e.g., vote probability index data).
Campaign Data	Supporter Data	Data held collected about the characteristics and activity of campaign activists/ donors which allows campaigns to most efficiently mobilize their supporter base for activities beyond voting.
	Evaluation Data	Data which is collected to evaluate the effectiveness of the campaign and specific campaign interventions (e.g., message testing)

sophisticated pictures of the electorate (Kreiss, 2017). In contrast, our second category, 'campaign data', captures references to data gathered about the campaign itself. This includes information about supporters, such as potential campaign donors (Walker & Nowlin, 2021), attendees of campaign events (Spiller & Bergner, 2014) or users of a campaign's online platforms (Giasson et al., 2019). It also captures data which 'evaluates' campaign activity, such as message testing data (Kreiss et al., 2018). These categories capture what we describe as universal types of data, but the literature also shows many particularities in the precise form of data that can be found in different contexts.

In particular, scholars show that the *same type* of data can vary substantially across different contexts. Several studies argue that voters' demographic information (and, in some US states, party affiliation) contained in public voter registration records is foundational for campaigns' voter files (Robinson, 2018; Van Onselen & Errington, 2004). Yet others show that whereas voter registration data is often available to parties in Anglo-American democracies, it isn't available in many European countries (Dobber et al., 2017, p. 7). Even where such data is available, it doesn't always contain data on party affiliation (Anstead, 2017, p. 305) meaning that parties are reliant on other data collection techniques (Dommett, 2019, p. 3; Harker, 2020, p. 8). Similarly, some studies outline how campaigns' ability to purchase voter data from third parties can be constrained by a country's data-protection framework (Bennett, 2015, p. 376; Kruschinski & Haller, 2017, p. 12; Lees-Marshment & Lilleker, 2012, p. 349), and/or by a lack of resources (e.g., Zuiderveen Borgesius et al., 2018, p. 92). Disparities in resources also influence parties' collecting evaluative data, with A/B testing, for example, often being seen as beyond the reach of campaigns (Harker, 2020; Lavigne, 2021; Stark, 2018), leading parties to use less resource-demanding metrics such as donations and email sign-ups (Howard, 2003; Kreiss et al., 2018). These examples demonstrate the importance of institutional and system-level factors in shaping the volume and variety of data that can be collected by a campaign.

Our analysis also revealed disagreement about the *type* of data that is indicative of DDC. For many scholars, digital data is a key source of information. Bennett (2015), for example, describes the availability of user-data from social media as one of the most important trends which characterises modern campaigns (p. 372). Others cite Facebook as a vital source of voter data (Bossetta, 2018; Harker, 2020, pp. 14–15; Jungherr, 2016; Robinson, 2018), although campaigns cannot access this data directly, and instead provide Facebook with individuals (or other criteria) which they then use to target ads themselves. The degree to which digital data *defines* DDC is, however, contested. For Römmele and Gibson, DDC is characterised by 'an organizational and strategic dependency on digital technology and 'big data' (2020, p. 595), suggesting that digital data is key. Yet, Baldwin-Philippi's (2017, 2019) understanding of DDC stipulates that most of its fundamental practices can be traced back to the 1990s and before. Anstead (2017) makes a similar point when suggesting that scholarship on DDC tends to conflate 'technologically intensive practices … with technologically defined practices' (p. 295). In other words, even if data-driven campaigns increasingly use digital data, this is not universally seen as indicative of this activity. This point of tension shows there to be different scholarly interpretations of the types of data that are indicative of DDC, helping to explain why different definitions may emerge.

Based on this review, a defining characteristic of DDC is the collection of, and/or access to a range of voter and/or campaign data. Furthermore, our analysis shows that particular types of this data may be present to different degrees in different places and may take subtly different forms. Differentiating between these characteristics, we see the former to be integral, whilst the latter are variable, helping us to define the essential attributes of data indicative of DDC.

Data analysis

Existing scholarship on DDC also sees the processing of voter and campaign data as an integral component, with frequent reference made to the use of data analysis, and more recently to analytics. Whilst the activities undertaken are rarely specified in great detail, we argue again that it is possible to classify broad trends that relate to the use of analysis to gather audience intelligence, or to optimise campaign interventions (Table 4).

In terms of our first category, audience intelligence, numerous studies reference the use of modelling, or making predictions about voter preferences (e.g., Kruschinski & Haller, 2017). Nickerson and Rogers describe modelling in detail, outlining how some campaigns measure the relationship between voters' personal characteristics and political attitudes, before assigning them a predictive score on a 0–100 index in terms of, for instance, their likelihood to turn out to vote, support their candidate or undertake other forms of political activity (2014, p. 54). Others describe the practice of 'psychometric profiling', where campaigns model voters' personality traits (Burkell & Regan, 2019, p. 4; Zarouali et al., 2020, p. 7) and then tailor specific campaign interventions to individual voters accordingly. Whilst these examples show that the specific form of analysis can vary, they are indicative of a recurring focus on the sorting and analysis of data to gain insight into a target audience.

In addition, we identify a second type of analysis connected to testing. Existing accounts suggest that data can be used – in Baldwin-Philippi's terms – to test 'how well messages perform against one another and using that information to drive content production and further targeting' (2017, p. 628). Again, scholarship focuses upon different types of testing, with attention paid to A/B testing (Stark, 2018), focus groups and behavioural monitoring (Baldwin-Philippi, 2019, p. 4), amongst other tools. Core to this idea is the capacity to analyze data in order to optimize campaign interventions.

Beyond these two types of analysis, and the specific examples of how these can be manifest, the existing literature also suggests that analyses can be enacted with different degrees of sophistication. Papakyriakopoulos et al. for instance describe 'the application of advanced statistical and machine learning algorithms, the possibilities of which enable the development of new political strategies' (2018, p. 1). Other studies make similar claims about campaigns' use of sophisticated data analysis, modelling and automation techniques to segment and profile voters (Murray & Scime, 2010; Nickerson & Rogers,

Table 4. Categories of analysis included as a part of DDC. P.15.

Category	Type	Description
Audience intelligence	Data segmentation, modelling,	Use of data analysis to understand audience
Campaign intervention optimization	A/B testing, behavioral monitoring perception analysis,	Use of data analysis to test the effectiveness of campaign interventions

2014; Stark, 2018; Zarouali et al., 2020), with much attention given to the potential for highly personalised microtargeting. Indeed, whilst most scholars fail to specify what constitutes 'micro' targeting (as opposed to mere targeting), it is widely claimed that campaigns combine data from multiple sources to profile *individual* voters and deploy personalised messages (Pentzold & Fölsche, 2020). And yet others cast doubt on this perspective. Kreiss (2017) notes that even sophisticated campaigns most effectively target voters using simple statistical methods which rely on a small cluster of people's basic characteristics. Others note that a large percentage of campaigns lack the capacity to (legally) target at the individual-level, and that more basic forms of geographic targeting are used instead (Dobber et al., 2017). Once again, therefore, it appears that there can be variations in the particular type of data analyses used in DDC.

Summarising these insights, we identify two further indicators of DDC, at least one of which must be in evidence to indicate the presence of DDC. These are either – the presence of analysis focused on audience intelligence, and/or the optimisation of campaign interventions. We also identify the potential for different specific types of process to be used leading to variation in the precise manifestation of DDC.

What does the literature say about data 'driving' campaigns?

Within existing literature, strikingly little attention is paid to the 'driven' element of DDC. We have highlighted above that Munroe and Munroe see data-driven campaigns as prioritising data rather than 'instinct, guesswork, intuition, tradition or rules of thumb' (2018, p. 4), but few other scholars question what it means for data to drive campaigns. There are, however, broad trends that characterise two ways in which data can be used to inform decision-making, which we classify as formative and evaluative decision-making (Table 5).

Our two types of decision-making closely reflect the forms of analysis outlined above. Noting the potential for campaigns to gather and analyse data in different ways, scholars have pointed to the different stages at which these insights can be sought and used by campaigns. Our first category, formative decision-making, captures a raft of accounts which hint at the potential for data analysis to guide campaign strategy. Ridout et al. describe how campaigns use data to identify 'voters or households that might be receptive to a specific mobilization or persuasion message' (2012, p. 3), while Bossetta argues that social media is valuable for campaigns as it allows them to 'monitor and harvest users' digital traces and appropriate them for decisions relating to persuasion or mobilization initiatives' (2018, p. 477; Baldwin-Philippi, 2017, p. 628). Walker and Nowlin (2021) also show the potential for data analysis to inform internal party activity (as opposed to voter communication strategies) by suggesting that data analysis can be used to inform fundraising strategy. Whilst, as these examples suggest, particular strategic decisions may

Table 5. Two types of decision informed by data. P.18.

Category	Type	Description
Formative	Segmentation, modelling supporters or undecided voters as possible target groups	Data used to inform decision-making about the campaign actions to take and/or the strategy to adopt.
Evaluative	Message testing, monitoring email open rates etc	Data used to evaluate campaign actions to optimize their effectiveness with a view to future action and/or strategy.

vary, there is a recurring focus on the way in which data is gathered and then employed to inform strategic decisions about campaign activity.

Our second form of decision-making is more evaluative, and focuses on the use of data analysis to retrospectively evaluate the success of campaign interventions. Closely associated with the types of testing outlined above, scholars have shown that these insights can be used to inform future decisions. Giasson et al. accordingly discuss how information is gathered about campaign interventions 'to make adjustments to the party's campaign strategy' (2019, p. 5; Chester & Montgomery, 2019, p. 6), whilst Stark notes that A/B testing can 'suggest both which design features could be better optimized for user engagement, and also how to improve an algorithm's predictive performance' (2018, p. 211). These indicative examples suggest that data can drive evaluative decision-making, not only being used to determine strategy, but also to evaluate the effectiveness of said strategy. The precise moment at which this form of evaluation occurs can vary, as can the types of evaluative mechanism utilised, once again showing the potential for different forms of DDC.

In terms of other areas of variation, studies offered contrasting empirical evidence, as well as conceptual claims concerning the degree to which data drives decision-making. At one extreme, some scholars imply that *all* decisions are informed by data (Newman, 2016, p. 788). Römmele and Gibson, for instance, describe how 'data are now hardwired into the campaign organization and operation' (2020, p. 597). Yet, in contrast, the work of Munroe and Munroe suggests that '[d]ata *may* inform campaign decisions in myriad ways (such as where or whom to canvass, or how a few hours of the candidate's time might best be used), but we should not assume that it will be used this way' (2018, pp. 4–6 – emphasis added). Similarly, Phillips et al. suggest, voter segmentation insights '*can aid* in the formation of political communications strategy, including theme and message development' (2010, p. 315 – emphasis added), but they are no means guaranteed to do so (Kreiss & Jasinski, 2016, pp. 557–558; Munroe & Munroe, 2018, p. 14). Nickerson and Rogers also argue that 'most campaign decisions did not rely on' data analytics and predictive scores as too few campaigners have the expertise to understand them and their potential value (2014, p. 3). Elsewhere, Kruschinski and Haller reflect that attempts to run a data-driven campaign can be frustrated if 'politicians refuse to use data-driven tools' (2017, p. 9).

Summarising these findings, we suggest that the use of data to either formulate strategy at the outset of a campaign, and/or to retrospectively evaluate its effectiveness is an integral feature of DDC. Beyond these attributes, we also conclude that there can be variation in, for example, the extent to which data drives decision-making and the situations in which data is used.

What does the literature say about campaigns that are data-driven?

We find evidence of three categories of campaign activity discussed in our sources: voter communication, resource generation and internal organization (Table 6). For voter communication, data-driven tools are seen as helping campaigns extend and intensify their efforts to contact voters with more individualized messages, tailored to their interests and identities. Harker (2020), for example, describes how data enables campaigns 'to target messages to voters at a high level of granularity, to test the efficacy of campaign messages in real time, and to differentiate messages to particular voters' (p. 7). These messages

Table 6. Indicative types of data-driven campaign activity. P.21.

Category	Examples		
Voter communication:	Voter mobilization and GOTV	Voter persuasion	Individualised micro-targeting
Resource-generation:	Fundraising	Recruiting and mobilizing activists	
Internal-organizational:	Staff recruitment and management	Strategy design and decision-making	Data analysis, coding and modelling

are often depicted as being selectively distributed to online audiences through ads and posts on social media networks and search engine sites (Chester & Montgomery, 2019; Harker, 2020; Moore, 2016; Nickerson & Rogers, 2014; Pons, 2016).

The specific aim of the communication described within the literature varies, however. Most studies link DDC to parties' voter mobilization activities and GOTV drives (Davidson & Binstock, 2011; Hersh & Schaffner, 2013; Nickerson & Rogers, 2014; Panagopoulos & Francia, 2009). Some, however, point to the use of such tools for persuasion (Nickerson & Rogers, 2014), with a significant strand of work devoted to the potential for manipulation of voter preferences (Zuiderveen Borgesius et al., 2018). Nickerson and Rogers also demonstrate the risk of 'mistargeting' (2014, p. 62), suggesting that campaigns may choose to not exploit all tools available to them.

Beyond voter communication, several studies also highlighted the application of data-driven techniques to generate and allocate a campaigns' resources. Some highlight how online micro-targeting is used to bolster campaigns' fundraising activities, allowing them to estimate the most efficient allocation '[of] potential resources to the potential donors producing the highest expected returns on the funds spent on solicitations' (Kreiss et al., 2018; Rubinstein, 2014; Walker & Nowlin, 2021, p. 4). Data-driven tactics are also linked to resource generation of the human variety, in terms of recruiting and activating local volunteers (Panagopoulos & Francia, 2009; Vaccari, 2010) to engage in virtual phone-banking, door-to-door canvassing and local fundraising events (Vaccari, 2010).

Our final category captures the maintenance and management of tasks that support the more outward voter and supporter facing operations. Some literature suggests that DDC requires an extensive infrastructure of hardware, software, technical skills and computational resources which often leads to a reliance on external providers and consultants (Chester & Montgomery, 2017; Nickerson & Rogers, 2014). Others have detailed campaigns' investment in 'in-house' capacity and expertise (Kreiss & Jasinski, 2016), with Römmele and Gibson for example describing how in the 2008 Democratic Presidential campaign, 'teams of software engineers, data analysts, and web and email experts worked together to build and exploit a vast, new, technological infrastructure' (2020, p. 604). More recently, diagnoses of a third more 'hybrid' model of internal organization have emerged. This involves social media companies effectively 'lending' their staff to campaigns to assist them in optimizing the use of their platforms and data (Kreiss & McGregor, 2018; Pentzold & Fölsche, 2020).

Once again, therefore, there is significant variance in the ways in which campaign activity can be informed by data. Distilling insights from these findings we suggest that a core feature of DDC is the use of data to inform either voter communication, resource generation or internal organizational activity. We do not see one category of campaigning activity to be superior to the others, but suggest that data must be utilised in at least one of these realms for practice to be indicative of DDC. Beyond this core

attribute, we once again suggest that significant variation in the precise type of campaigning and use of data can be observed.

Discussion

A systematic review of the existing literature has shown that current scholarship associates a number of distinct processes and practices with DDC, but that it offers little clarity as to what elements are integral in definitional terms, and those that can vary across time and space. This lack of clarity, we argue, has made it difficult to answer key questions about DDC, such as whether it is something new, whether it is found in different contexts and whether it evolves over time. Our approach is to offer a new definition that focuses on identifying the integral characteristics of DDC and those which can vary. Combining insights from the wider reviewed corpus of work on DDC, we suggest that any definition needs to incorporate the essential attributes of data, decision-making and campaigning that we have identified. As such we suggest that DDC involves first, the collection of voter and/or campaign data that is deployed either for the purposes of audience intelligence or campaign intervention optimization. Second, that it involves data driving decision-making in a formative or evaluative manner. Third and finally that it captures the use of data for campaign activities relating to either voter communication, resource generation or internal organisation. Compiling these attributes, we define DDC as follows:

> DDC relies on accessing and analyzing voter and/or campaign data to generate insights into the campaign's target audience(s) and/or to optimize campaign interventions. Data is used to inform decision-making in a formative and/or evaluative capacity, and is employed to engage in campaigning efforts around either voter communication, resource generation and/or internal organization.

In offering this definition, we recognise that the specific manifestations of these practices will vary. It would be expected that differing legal and political contexts would influence the type of voter and campaign data that parties can draw upon, as well as the precise techniques that they are able to use to optimize campaign interventions. This means that specific practices, such as the use of A/B testing or investment in internal party databases, should not be seen as intrinsic to DDC, but rather as possible manifestations of the broader practices we identify. This represents an advance on previous definitions, which have tended to be prescriptive in linking DDC to certain practices to the exclusion of others.

Our definition also helps us to more clearly map change over time and to answer questions related to the novelty of DDC. Focusing on the core characteristics we have identified, it is arguable that there is nothing inherently new about DDC. Indeed, it is possible to find instances where parties use of polling data constituted a form of DDC in that voter data was used to gain insight into a target audience that then became the basis on which formative campaign decisions were made about where to mobilize voters. This is not to say, however, that whenever parties conduct and use polls that DDC is always present, since not all of our three conditions may be met. For example, there have no doubt been times when parties conducted polls but these data did not inform formative or evaluative decision-making. This latter insight is useful in making the wider point that a

proliferation of data usage, particularly in digital form, is in itself not an inherent characteristic of DDC. Just because a party is engaged in A/B testing via a social media platform does not therefore mean it is engaged in DDC, unless there is also evidence that data is being gathered and used to inform formative or evaluative decision-making.

In offering our definition we do, however, acknowledge limitations in our study. Our analysis is based on a particular sample of pre-existing studies and hence we do not claim to have captured the full range of ways in which DDC can vary. Future empirical scholarship will be critical to cataloguing the different ways in which DDC can be operationalised in practice. And yet, because our definition focuses on essential characteristics that are unlikely to change, we argue that it is likely to endure as it can be updated by showing new particular practices that speak to these essential characteristics.

Conclusion

In this paper we set out to examine existing conceptions of DDC, arguing that despite growing interest in this phenomenon, there is little clarity about what defines it. Undertaking a systematic review, we have explored existing discussions of data, decision-making and campaigning to show the diversity of ways in which each element of this activity has been understood. Drawing on this review, we have identified a set of core features of DDC that we argue can vary in practice across time and space, and shown how the specific manifestations of these attributes may vary. We would expect these variations to reflect factors such as the design of the electoral system, restrictions on campaign expenditures, and perhaps most importantly the extent of controls on campaigns use of voters' personal data. Arguably systems where compulsory voting exists, or there are stronger spending limits or data protection laws, we will see less intensive or advanced versions of DDC. In such cases, however, we would still expect versions of DDC to emerge that centre on finding and mobilising likely supporters, finances and volunteers at the most granular level possible. It is for future research to fully theorize, hypothesize and test the role of these contextual factors on these activities. The disaggregated and flexible approach to defining DDC that we have developed in this paper we argue represents an important step toward that goal in that it allows scholars to understand DDC in a more contextual and intrinsically comparative manner rather than a 'one size fits all' approach.

Our findings are particularly important given growing calls for more comparative, and especially less US-centric studies of DDC. By disaggregating the various manifestations of DDC from the more general categories of activity that we associate with it, we argue there is potential for different versions of DDC to emerge in different contexts. Going forward, we suggest that future research is required to map and explain the different forms of DDC observed in different countries and party systems. Such work will need to build upon existing scholarship that points to the significance of resource and regulatory context to understand why DDC looks different in specific contexts.

Notes

1. OpenGrey was selected as it allowed us to run the same combination of search terms as with the academic databases, but did not deliver any relevant results.

2. Cambridge Analytica, disinformation, misinformation and propaganda were included to capture literature on the 2016 American Presidential Election and the 2016 Referendum on the UK's membership of the EU

3. For Scopus, we retained results from the (i) Social Sciences, (ii) Business, Management and Accounting, (iii) Arts and Humanities and (iv) Economics, Econometrics categories. For Web of Knowledge, we used their Social Science and Arts and Humanities categories.

4. Each author employed a 'traffic-lights system' where abstracts were graded according to their relevance to DDC. Papers deemed relevant by both authors were included for analysis, whereas irrelevant cases were excluded. Coders disagreed on 51 cases out of 194, and for these a joint decision was made after consulting a third author. For unclear cases, the full text of the article was read to ascertain its relevance to DDC (56 cases out of 194).

5. Systematic reviews don't achieve complete coverage, so we do not claim that no such research exists. Our search criteria being in English is also likely to influence the geographical distribution of our sources.

6. We didn't filter texts on the basis of their publication date

7. This table identifies the types of data we found mentioned within our identified sources, it may not therefore capture all types of data.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

Notes on contributors

Katharine Dommett is a Professor of Politics in the Department of Politics and International Relations at the University of Sheffield and the author of The Reimagined Party: Democracy, Change and the Public.

Andrew Barclay is a Research Associate in the Department of Politics and International Relations at the University of Sheffield.

Rachel Gibson is a professor of political science at the University of Manchester and has published widely on the topic of digital parties and the use of new communication technology in campaigns and elections.

References

Anstead, N. (2017). Data-driven campaigning in the 2015 United Kingdom general election. *The International Journal of Press/Politics*, *22*(3), 294–313. https://doi.org/10.1177/1940161217706163

Baldwin-Philippi, J. (2017). The myths of data-driven campaigning. *Political Communication*, *34*(4), 627–633. https://doi.org/10.1080/10584609.2017.1372999

Baldwin-Philippi, J. (2019). Data campaigning: Between empirics and assumptions. *Internet Policy Review*, *8*(4), 1–18. https://doi.org/10.14763/2019.4.1437

Bartlett, J. (2018). *The people vs. tech: How the Internet is killing democracy (and how we save it)*. Random House.

Bennett, C. J. (2015). Trends in voter surveillance in western societies: Privacy intrusions and democratic implications. *Surveillance & Society*, *13*(3/4), 370–384. https://doi.org/10.24908/ss.v13i3/4.5373

Bennett, C. J., & Lyon, D. (2019). Data-driven elections: Implications and challenges for democratic societies. *Internet Policy Review*, *8*(4), 1–16. https://doi.org/10.14763/2019.4.1433

Bossetta, M. (2018). The digital architectures of social media. *Journalism & Mass Communication Quarterly*, *95*(2), 471–496. https://doi.org/10.1177/1077699018763307

Brkan, M. (2020). EU fundamental rights and democracy implications of data-driven political campaigns. *Maastricht Journal of European and Comparative Law*, *27*(6), 774–790. https://doi.org/10.1177/1023263X20982960

Burkell, J., & Regan, P. (2019). Voter preferences, voter manipulation, voter analytics: Policy options for less surveillance and more autonomy. *Internet Policy Review*, *8*(4), 1–24. https://doi.org/10.14763/2019.4.1438

Chester, J., & Montgomery, K. C. (2017). The role of digital marketing in political campaigns. *Internet Policy Review*, *6*(4), 1–20. https://doi.org/10.14763/2017.4.773

Chester, J., & Montgomery, K. C. (2019). The digital commercialisation of US politics – 2020 and beyond. *Internet Policy Review*, *8*(4), 1–23. https://doi.org/10.14763/2019.4.1443

Clarke, V., & Braun, V. (2014). Thematic analysis. In T. Teo (Ed.), *Encyclopaedia of critical psychology* (pp. 1947–1952). Springer.

Dacombe, R. (2018). Systematic Reviews in Political Science: What can the approach contribute to political research? *Political Studies Review*, *16*(2), 148–157. https://doi.org/10.1177/1478929916680641

Davidson, S., & Binstock, R. H. (2011). Political marketing and segmentation in aging democracies. In J. Lees-Marshememt (Ed.), *Routledge handbook of political marketing* (pp. 36–49). Routledge.

Dobber, T., Trilling, D., Helberger, N., & De Vreese, C. H. (2017). Two crates of beer and 40 pizzas: The adoption of innovative political behavioural targeting techniques. *Internet Policy Review*, *6*(4), 1–25. https://doi.org/10.14763/2017.4.777

Dommett, K. (2019). Data-driven political campaigns in practice: Understanding and regulating diverse data-driven campaigns. *Internet Policy Review*, *8*(4), 1–18. https://doi.org/10.14763/2019.4.1432.

Giasson, T., Le Bars, G., & Dubois, P. (2019). Is social media transforming Canadian electioneering? *Canadian Journal of Political Science*, *52*(2), 323–341. https://doi.org/10.1017/S0008423918000902

Glass, G. V. (1976). Primary, secondary, and meta-analysis of research. *Educational Researcher*, *5*(10), 3–8. https://doi.org/10.3102/0013189X005010003

Harker, M. (2020). Political advertising revisited: Digital campaigning and protecting democratic discourse. *Legal Studies*, *40*(1), 151–171. https://doi.org/10.1017/lst.2019.24

Hersh, E. D., & Schaffner, B. F. (2013). Targeted campaign appeals and the value of ambiguity. *The Journal of Politics*, *75*(2), 520–534.

Howard, P. N. (2003). Digitizing the social contract: Producing American political culture in the age of new media. *The Communication Review*, *6*(3), 213–245. https://doi.org/10.1080/10714420390226270

Issenberg, S. (2012). *The victory Lab: The secret science of winning campaigns*. Broadway Books.

Joathan, Í, & Lilleker, D. G. (2020). Permanent Campaigning: A meta-analysis and framework for measurement. *Journal of Political Marketing*, 1–19. https://doi.org/10.1080/15377857.2020.1832015.

Jungherr, A. (2016). Four functions of digital tools in election campaigns: The German case. *The International Journal of Press/Politics*, *21*(3), 358–377. https://doi.org/10.1177/1940161216642597

Kefford, G. (2021). *Political parties and campaigning in Australia: Data, digital and field*. Springer Nature.

Kefford, G., Dommett, K., Baldwin-Philippi, J., Bannerman, S., Dobber, T., Kruschinski, S., Kruikemeier, S., & Rzepecki, E. (2022). Data-driven campaigning and democratic disruption:

Evidence from six advanced democracies. *Party Politics*, 13540688221084039. https://doi.org/10.1177/1354068822108403

Kreiss, D. (2016). *Prototype politics: Technology-intensive campaigning and the data of democracy*. Oxford University Press.

Kreiss, D. (2017). Micro-targeting, the quantified persuasion. *Internet Policy Review*, 6(4), 1–14. https://doi.org/10.14763/2017.4.774

Kreiss, D., & Jasinski, C. (2016). The tech industry meets presidential politics: Explaining the Democratic Party's technological advantage in electoral campaigning. *Political Communication*, 33(4), 544–562. https://doi.org/10.1080/10584609.2015.1121941

Kreiss, D., Lawrence, R. G., & McGregor, S. C. (2018). In their own words: Political practitioner accounts of candidates, audiences, affordances, genres, and timing in strategic social media use. *Political Communication*, 35(1), 8–31. https://doi.org/10.1080/10584609.2017.1334727

Kreiss, D., & McGregor, S. C. (2018). Technology firms shape political communication: The work of Microsoft, Facebook, Twitter, and Google with campaigns during the 2016 US presidential cycle. *Political Communication*, 35(2), 155–177. https://doi.org/10.1080/10584609.2017.1364814

Kruschinski, S., & Haller, A. (2017). Restrictions on data-driven political micro-targeting in Germany. *Internet Policy Review*, 6(4), 1–23. https://doi.org/10.14763/2017.4.780

Lavigne, M. (2021). Strengthening ties: The influence of microtargeting on partisan attitudes and the vote. *Party Politics*, 27(5), 1354068820918387. https://doi.org/10.1177/1354068820918387

Lees-Marshment, J., & Lilleker, D. G. (2012). Knowledge sharing and lesson learning: Consultants' perspectives on the international sharing of political marketing strategy. *Contemporary Politics*, 18(3), 343–354. https://doi.org/10.1080/13569775.2012.702976

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Moore, M. (2016). Facebook, the conservatives and the risk to fair and open elections in the UK. *The Political Quarterly*, 87(3), 424–430. https://doi.org/10.1111/1467-923X.12291

Munroe, K. B., & Munroe, H. D. (2018). Constituency campaigning in the age of data. *Canadian Journal of Political Science*, 51(1), 135–154. https://doi.org/10.1017/S0008423917001135

Murray, G. R., & Scime, A. (2010). Microtargeting and electorate segmentation: Data mining the American National Election Studies. *Journal of Political Marketing*, 9(3), 143–166. https://doi.org/10.1080/15377857.2010.497732

Neuendorf, K. A. (2018). Content analysis and thematic analysis. In P. Gough (Ed.), *Advanced research methods for applied psychology* (pp. 211–223). Routledge .

Newman, B. I. (2016). Reinforcing lessons for business from the marketing revolution in US presidential politics: A Strategic Triad. *Psychology & Marketing*, 33(10), 781–795. https://doi.org/10.1002/mar.20917

Nickerson, D. W., & Rogers, T. (2014). Political campaigns and big data. *Journal of Economic Perspectives*, 28(2), 51–74. https://doi.org/10.1257/jep.28.2.51

Oliver, K., & Cairney, P. (2019). The dos and don'ts of influencing policy: A systematic review of advice to academics. *Palgrave Communications*, 5(1), 1–11. https://doi.org/10.1057/s41599-018-0199-0

Panagopoulos, C., & Francia, P. L. (2009). Grassroots mobilization in the 2008 presidential election. *Journal of Political Marketing*, 8(4), 315–333. https://doi.org/10.1080/15377850903263805

Papakyriakopoulos, O., Hegelich, S., Shahrezaye, M., & Serrano, J. C. M. (2018). Social media and microtargeting: Political data processing and the consequences for Germany. *Big Data & Society*, 5(2), 205395171881184. https://doi.org/10.1177/2053951718811844

Pentzold, C., & Fölsche, L. (2020). Data-driven campaigns in public sensemaking. *Communications*, 45(1), 535–559. https://doi.org/10.1515/commun-2019-0125

Phillips, J. M., Reynolds, T. J., & Reynolds, K. (2010). Decision-based voter segmentation: An application for campaign message development. *European Journal of Marketing*, 44(3/4), 310–330. https://doi.org/10.1108/03090561011020444

Pons, V. (2016). Has social science taken over electoral campaigns and should we regret it? *French politics, Culture & Society*, *34*(1), 34–47. https://doi.org/10.3167/fpcs.2016.340104

Ridout, T. N., Franz, M., Goldstein, K. M., & Feltus, W. J. (2012). Separation by television program: Understanding the targeting of political advertising in presidential elections. *Political Communication*, *29*(1), 1–23. https://doi.org/10.1080/10584609.2011.619509

Robinson, S. (2018). Databases and Doppelgängers: New articulations of power. *Configurations*, *26* (4), 411–440. https://doi.org/10.1353/con.2018.0035

Römmele, A., & Gibson, R. (2020). Scientific and subversive: The two faces of the fourth era of political campaigning. *New Media & Society*, *22*(4), 595–610. https://doi.org/10.1177/1461444819893979

Rubinstein, I. S. (2014). Voter privacy in the age of big data. *2014 Wisconsin Law Review*, *2014* (5), 861–936.

Spiller, L., & Bergner, J. (2014). Database political marketing in campaigning and government. In J. Lees-Marshment, B. Conley, & K. Cosgrove (Eds.), *Political marketing in the United States* (pp. 62–78). *Routledge.*

Stark, L. (2018). Algorithmic psychometrics and the scalable subject. *Social Studies of Science*, *48* (2), 204–231. https://doi.org/10.1177/0306312718772094

Tracy, S. J. (2019). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*. John Wiley & Sons.

Vaccari, C. (2010). "Technology is a commodity": The internet in the 2008 United States presidential election. *Journal of Information Technology & Politics*, *7*(4), 318–339. https://doi.org/10.1080/19331681003656664

Van Onselen, P., & Errington, W. (2004). Electoral databases: Big brother or democracy unbound? *Australian Journal of Political Science*, *39*(2), 349–366. https://doi.org/10.1080/1036114042000238555

Walker, D., & Nowlin, E. L. (2021). Data-driven precision and selectiveness in political campaign fundraising. *Journal of Political Marketing*, *20*(2), 73–92. https://doi.org/10.1080/15377857.2018.1457590

Yom, S. (2015). From methodology to practice: Inductive iteration in comparative research. *Comparative Political Studies*, *48*(5), 616–644. https://doi.org/10.1177/0010414014554685

Zarouali, B., Dobber, T., De Pauw, G., & de Vreese, C. (2020). Using a personality-profiling algorithm to investigate political microtargeting. *Communication Research*, *49*(8), 1066–1091. https://doi.org/10.1177/0093650220961965

Zuiderveen Borgesius, F., Möller, J., Kruikemeier, S., Ó Fathaigh, R., Irion, K., Dobber, T., Bodo, B., & de Vreese, C. H. (2018). Online political microtargeting: Promises and threats for democracy. *Utrecht Law Review*, *14*(1), 82–96. doi:10.18352/ulr.420

Appendix

Articles included within systematic review

Anstead, N. (2017). Data-driven campaigning in the 2015 United Kingdom general election. *The International Journal of Press/Politics*, 22 (3), pp.294-313.

Baldwin-Philippi, J. (2017). The myths of data-driven campaigning. *Political Communication*, 34 (4), pp.627-633.

Baldwin-Philippi, J. (2019). Data campaigning: Between empirics and assumptions. *Internet Policy Review*, 8 (4), pp.1-18.

Baldwin-Philippi, J. (2020). Data ops, objectivity, and outsiders: journalistic coverage of data campaigning. *Political Communication*, 37 (4), pp.468-487.

Barocas, S. (2012). The price of precision: Voter microtargeting and its potential harms to the democratic process. In *Proceedings of the first edition workshop on Politics, elections and data,* pp. 31-36.

Bennett, C.J. (2015). Trends in Voter Surveillance in Western Societies: Privacy Intrusions and Democratic Implications. *Surveillance & Society*, 13 (3/4), pp.370-384.

Bennett, C.J. (2016). Voter databases, micro-targeting, and data protection law: can political parties campaign in Europe as they do in North America?. *International Data Privacy Law*, 6 (4), pp.261-275.

Bodó, B., Helberger, N. & de Vreese, C.H., (2017). Political micro-targeting: a Manchurian candidate or just a dark horse?. *Internet Policy Review*, 6 (4), pp.1-13.

Bossetta, M. (2018). The digital architectures of social media: Comparing political campaigning on Facebook, Twitter, Instagram, and Snapchat in the 2016 US election. *Journalism & mass communication quarterly*, 95 (2), pp.471-496.

Brkan, M. (2020). EU fundamental rights and democracy implications of data-driven political campaigns. *Maastricht Journal of European and Comparative Law*, 27 (6), pp.774-790.

Burkell, J. & Regan, P.M. (2019). Voter preferences, voter manipulation, voter analytics: policy options for less surveillance and more autonomy. *Internet Policy Review*, 8(4), pp.1-24.

Cacciotto, M.M. (2017). Is political consulting going digital?. *Journal of Political Marketing*, 16 (1), pp.50-69.

Chester, J. & Montgomery, K.C. (2017). The role of digital marketing in political campaigns. *Internet Policy Review*, 6 (4), pp.1-20.

Chester, J. & Montgomery, K.C. (2019). The digital commercialisation of US politics—2020 and beyond. *Internet Policy Review*, 8 (4)

Davidson, S. & Binstock, R.H. (2011). Political marketing and segmentation in aging democracies in Lees-Marshememt, J. (ed) *Routledge Handbook of Political Marketing*. Abingdon: Routledge

Dobber, T., Trilling, D., Helberger, N. & De Vreese, C.H. (2017). Two crates of beer and 40 pizzas: the adoption of innovative political behavioural targeting techniques. *Internet Policy Review*, 6 (4), pp.1-25.

Dobber, T., Ó Fathaigh, R. & Zuiderveen Borgesius, F. (2019). The regulation of online political micro-targeting in Europe. *Internet Policy Review*, 8 (4).

Dommett, K. and Temple, L. (2018). Digital Campaigning: The Rise of Facebook and Satellite Campaigns. *Parliamentary Affairs*, 71, pp.189-202.

Dommett, K. (2019). Data-driven political campaigns in practice: understanding and regulating diverse data-driven campaigns. *Internet Policy Review*, 8 (4).

Endres, K. (2016). The accuracy of microtargeted policy positions. *PS: Political Science & Politics*, 49 (4), pp.771-774.

Endres, K. & Kelly, K.J. (2018). Does microtargeting matter? Campaign contact strategies and young voters. *Journal of Elections, Public Opinion and Parties*, 28 (1), pp.1-18.

Evangelista, R. & Bruno, F. (2019). WhatsApp and political instability in Brazil: targeted messages and political radicalisation. *Internet Policy Review*, 8 (4), pp.1-23.

Farrell, D.M., Kolodny, R. & Medvic, S. (2001). Parties and campaign professionals in a digital age: Political consultants in the United States and their counterparts overseas. *Harvard International Journal of Press/Politics*, 6 (4), pp.11-30.

Fisher, J. & Denver, D. (2008). From foot-slogging to call centres and direct mail: A framework for analysing the development of district-level campaigning. *European Journal of Political Research*, 47 (6), pp.794-826.

Fulgoni, G.M., Lipsman, A. & Davidsen, C. (2016). The power of political advertising: Lessons for practitioners: How data analytics, social media, and creative strategies shape US presidential election campaigns. *Journal of Advertising Research*, 56 (3), pp.239-244.

Giasson, T., Le Bars, G. & Dubois, P. (2019). Is Social Media Transforming Canadian Electioneering? Hybridity and Online Partisan Strategies in the 2012 Quebec Election. *Canadian Journal of Political Science,* 52 (2), pp.323-341.

González, R.J. (2017). Hacking the citizenry?: Personality profiling, 'big data' and the election of Donald Trump. *Anthropology Today*, 33 (3), pp.9-12.

Harker, M. (2020). Political advertising revisited: digital campaigning and protecting democratic discourse. *Legal Studies*, 40 (1), pp.151-171.

Hatch, R.S. (2016). Party organizational strength and technological capacity: The adaptation of the state-level party organizations in the United States to voter outreach and data analytics in the Internet age. *Party Politics*, 22 (2), pp.191-202.

Hersh, E.D. & Schaffner, B.F. (2013). Targeted campaign appeals and the value of ambiguity. *The Journal of Politics*, 75 (2), pp.520-534.

Hersh, E.D. (2015). *Hacking the electorate: How campaigns perceive voters*. Cambridge University Press.

Howard, P.N. (2003). Digitizing the social contract: Producing American political culture in the age of new media. *The Communication Review*, 6 (3), pp.213-245.

Howard, P.N. (2005). Deep democracy, thin citizenship: The impact of digital media in political campaign strategy. *The ANNALS of the American Academy of Political and Social Science*, 597 (1), pp.153-170.

Howard, P.N., Carr, J.N. & Milstein, T.J. (2005). Digital technology and the market for political surveillance. *Surveillance & Society*, 3 (1), pp.59-73.

Howard, P.N. (2006). *New media campaigns and the managed citizen*. Cambridge University Press.

Johnson, D.W. (2016). *Campaigning in the twenty-first century: Activism, big data, and dark money*. Routledge.

Jungherr, A. (2016). Four functions of digital tools in election campaigns: The German case. *The International Journal of Press/Politics*, 21 (3), pp.358-377.

Kreiss, D. (2012). *Taking our country back: The crafting of networked politics from Howard Dean to Barack Obama*. Oxford University Press.

Kreiss, D. & Jasinski, C. (2016). The tech industry meets presidential politics: Explaining the Democratic Party's technological advantage in electoral campaigning, 2004–2012. *Political Communication*, 33 (4), pp.544-562.

Kreiss, D. (2017). Micro-targeting, the quantified persuasion. *Internet Policy Review*, 6 (4). Pp.1-14

Kreiss, D. & Saffer, A.J. (2017). Networks and innovation in the production of communication: Explaining innovations in US electoral campaigning from 2004 to 2012. *Journal of Communication*, 67 (4), pp.521-544.

Kreiss, D., Lawrence, R.G. & McGregor, S.C. (2018). In their own words: Political practitioner accounts of candidates, audiences, affordances, genres, and timing in strategic social media use. *Political communication*, 35 (1), pp.8-31.

Kruschinski, S. & Haller, A. (2017). Restrictions on data-driven political micro-targeting in Germany. *Internet Policy Review*, 6 (4), pp.1-23.

Lavigne, M. (2021). Strengthening ties: The influence of microtargeting on partisan attitudes and the vote. *Party Politics*, 27 (5) p.1354068820918387.

Lees-Marshment, J. & Lilleker, D.G. (2012). Knowledge sharing and lesson learning: consultants' perspectives on the international sharing of political marketing strategy. *Contemporary Politics*, 18 (3), pp.343-354.

Lilleker, D.G. (2016). Comparing online campaigning: The evolution of interactive campaigning from Royal to Obama to Hollande. *French Politics*, 14 (2), pp.234-253.

McGregor, S.C. (2020). "Taking the Temperature of the Room" How Political Campaigns Use Social Media to Understand and Represent Public Opinion. *Public Opinion Quarterly*, 84 (1), pp.236-256.

Montigny, E., Dubois, P.R. & Giasson, T. (2019). On the edge of glory (… or catastrophe): regulation, transparency and party democracy in data-driven campaigning in Québec. *Internet Policy Review*, 8 (4).

Moore, M. (2016). Facebook, the Conservatives and the Risk to Fair and Open Elections in the UK. *The Political Quarterly*, 87 (3), pp.424-430.

Munroe, K.B. & Munroe, H.D. (2018). Constituency campaigning in the age of data. *Canadian Journal of Political Science,* 51 (1), pp.135-154.

Murray, G.R. & Scime, A. (2010). Microtargeting and electorate segmentation: data mining the American National Election Studies. *Journal of Political Marketing*, 9 (3), pp.143-166.

Neudert, L.M. (2020). Hurdles and Pathways to Regulatory Innovation in Digital Political Campaigning. *The Political Quarterly*, 91 (4), pp.713-721.

Newman, B.I. (2016). Reinforcing lessons for business from the marketing revolution in US presidential politics: A Strategic Triad. *Psychology & Marketing*, 33 (10), pp.781-795.

Nickerson, D.W. & Rogers, T. (2014). Political campaigns and big data. *Journal of Economic Perspectives*, 28 (2), pp.51-74.

Oliver, K. & Cairney, P. (2019). The dos and don'ts of influencing policy: a systematic review of advice to academics. *Palgrave Communications*, 5 (1), pp.1-11.

Panagopoulos, C. & Francia, P.L. (2009). Grassroots mobilization in the 2008 presidential election. *Journal of Political Marketing*, 8 (4), pp.315-333.

Papakyriakopoulos, O., Hegelich, S., Shahrezaye, M. & Serrano, J.C.M. (2018) Social media and microtargeting: Political data processing and the consequences for Germany. *Big Data & Society*, 5 (2), p.2053951718811844.

Pentzold, C. & Fölsche, L. (2020). Data-driven campaigns in public sensemaking: Discursive positions, contextualization, and maneuvers in American, British, and German debates around computational politics. *Communications*, 45 (1), pp.535-559.

Phillips, J.M., Reynolds, T.J. & Reynolds, K. (2010). Decision-based voter segmentation: an application for campaign message development. *European Journal of Marketing*, 44 (3/4) pp.310-330

Pons, V. (2016). Has Social Science Taken Over Electoral Campaigns and Should We Regret It? *French Politics, Culture & Society*, 34 (1), pp.34-47.

Ribeiro, F.N., Saha, K., Babaei, M., Henrique, L., Messias, J., Benevenuto, F., Goga, O., Gummadi, K.P. & Redmiles, E.M. (2019) On microtargeting socially divisive ads: A case study of Russia-linked ad campaigns on Facebook. In *Proceedings of the conference on fairness, accountability, and transparency,* pp. 140-149.

Richterich, A. (2018). How data-driven research fuelled the Cambridge Analytica controversy. *Partecipazione e conflitto*, 11 (2), pp.528-543.

Ridout, T.N., Franz, M., Goldstein, K.M. & Feltus, W.J. (2012). Separation by television program: Understanding the targeting of political advertising in presidential elections. *Political Communication*, 29 (1), pp.1-23.

Robinson, S. (2018). Databases and Doppelgängers: New articulations of power. *Configurations*, 26 (4), pp.411-440.

Römmele, A. & Gibson, R. (2020). Scientific and subversive: The two faces of the fourth era of political campaigning. *New Media & Society*, 22 (4), pp.595-610.

Rubinstein, I.S. (2014). Voter privacy in the age of big data. *Wis. L. Rev.,* 5, pp.861-936

Schipper, B.C. & Woo, H. (2018) Political awareness, microtargeting of voters, and negative electoral campaigning. *Microtargeting of Voters, and Negative Electoral Campaigning*

Simon, F.M. (2019). "We power democracy": Exploring the promises of the political data analytics industry. *The Information Society*, 35 (3), pp.158-169.

Spiller, L. & Bergner, J. (2014). Database political marketing in campaigning and government. In Lees-Marshment, J., Conley, B. and Cosgrove, K. (eds) *Political marketing in the United States*, Routledge, pp.62-78

Stark, L. (2018). Algorithmic psychometrics and the scalable subject. *Social Studies of Science*, 48 (2), pp.204-231.

Tenscher, J. & Mykkänen, J. (2014) Two Levels of Campaigning: An Empirical Test of the Party-Centred Theory of Professionalisation. *Political Studies*, 62 (1), pp.20-41.

Vaccari, C. (2010). "Technology is a commodity": the internet in the 2008 United States presidential election. *Journal of information technology & politics*, 7 (4), pp.318-339.

Van Onselen, P. & Errington, W. (2004). Electoral databases: Big brother or democracy unbound?. *Australian Journal of Political Science*, 39 (2), pp.349-366.

Waismel-Manor, I. (2011). Spinning Forward: Professionalization Among Campaign Consultants. *Journal of Political Marketing*, 10 (4), pp.350-371.

Walker, D. & Nowlin, E.L. (2021). Data-Driven Precision and Selectiveness in Political Campaign Fundraising. *Journal of Political Marketing*, 20 (2), pp.73-92.

Ward, K. (2018). Social networks, the 2016 US presidential election, and Kantian ethics: applying the categorical imperative to Cambridge Analytica's behavioral microtargeting. *Journal of media ethics*, 33 (3), pp.133-148.

Wills, D. and Reeves, S. (2009). Facebook as a political weapon: Information in social networks. *British politics*, 4 (2), pp.265-281.

Zarouali, B., Dobber, T., De Pauw, G. & de Vreese, C. (2020). Using a personality-profiling algorithm to investigate political microtargeting: assessing the persuasion effects of personality-tailored ads on social media. *Communication Research*, p.0093650220961965.

Zuiderveen Borgesius, F., Möller, J., Kruikemeier, S., Ó Fathaigh, R., Irion, K., Dobber, T., Bodo, B. & de Vreese, C.H., (2018). Online political microtargeting: promises and threats for democracy. *Utrecht Law Review*, 14 (1), pp.82-96